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Less Than Zero: The Brave New World of Negative Interest Rates

As recently as two years ago, many economists viewed negative rates as forbidden territory – much the way some aviation experts prior to 1947 predicted that any airplane trying to break the sound barrier would explode. Then, in 2014, the European Central Bank and several smaller European financial authorities sent key interest rates into negative territory in an effort to spur economic growth. Japan followed earlier this year, and in early August, fears that the Bank of England was about to go negative precipitated a wave of cash hoarding on the part of British savers.

Two years into the experiment, it's time for a more balanced view, says Wellesley College economist Daniel Sichel. While negative rates have hardly proved to be a panacea for the slumping global economy, neither have they wrought the sort of chaos and disaster that naysayers predicted. Far from representing a descent into monetary madness, negative rates are simply the latest practical step by central bankers trying everything in their toolkit to put their economies on a positive course, says Sichel.

A former economist with both the Federal Reserve and the Treasury Department, Sichel spoke with *OUTLOOK* about the logic behind negative rates, why he believes they're a remote (but not impossible) option for the United States, and how analysts will ultimately look back on this remarkable period in the history of monetary policy.

OUTLOOK: What are negative interest rates, and why do they represent such a departure from the norm?

Daniel Sichel: The financial arrangement that most people are used to is: If you borrow money, you pay interest. And if you make a deposit in a bank, implicitly lending the bank money for a time, they pay you interest. With negative interest rates, you actually pay the bank for the privilege of having your money there. Central bankers see it as an extension of their tools to stimulate the economy. But from the perspective of the public, it seems like a really radical, unusual, unnatural step, almost an Alice in Wonderland scenario.

This Month's Expert



Daniel Sichel has been a professor of economics at Wellesley College in Massachusetts since 2012,

focusing on macroeconomics, productivity and economic growth, technology, and economic measurement. Before joining the Wellesley faculty, Dr. Sichel served at the Federal Reserve Board in Washington, where he helped guide the Fed's forecast and analysis of the U.S. economy. He also served as assistant to the chair of the Airline Transportation Stabilization Board, established to support the aviation industry after the attacks of September 11.

From 1993 to 1995, Dr. Sichel served as a research associate at the Brookings Institution, where he wrote the book *The Computer Revolution*, about information technology and economic growth. From 1995 to 1996 he served as Deputy Assistant Secretary for Macroeconomic Policy at the Treasury Department. He is a Research Associate with the National Bureau of Economic Research and serves on the Advisory Committee of the Bureau of Economic Analysis. He earned his bachelor's degree and a master's in public policy from the University of Michigan and his Ph.D. in economics from Princeton.

OUTLOOK: How did we get to this situation?

DS: In the fall of 2008, the financial crisis that started with the Lehman Brothers collapse quickly spread throughout the U.S. financial markets and around the world. The United States was shedding 700,000 to 800,000 jobs per month, unemployment was shooting up, and the economy was contracting very quickly. The Federal Reserve and central banks in other countries began lowering interest rates to try to stimulate economic activity. And by the end of 2008, the Fed had lowered the federal funds rate to zero and essentially kept it there until last December, when they raised it just a bit.

For most of that time, economists referred to the "zero lower bound" – the idea being that rates really couldn't go below zero. What's happened in the last couple of years is that countries in the Eurozone, along with Japan, Sweden, Switzerland, Denmark, and Hungary (though not the United States) have actually set the rate a little bit negative, ranging from a tenth of a percent below zero to three-quarters of a percent below zero.

OUTLOOK: What are they hoping to accomplish?

DS: They've done this as another effort to stimulate their lagging economies, following the logic that lower interest rates make it less expensive for individuals or businesses to borrow and spend or invest. To them, it's just another step in a long process of lowering interest rates.

What's so surprising to people is that everyone had thought that zero really was the "lower bound." For decades, economics textbooks said you couldn't have negative interest rates because businesses and individuals would stop depositing money and just stockpile cash. But these central banks have shown that zero is not the bottom – it's possible to push interest rates below zero.

OUTLOOK: In a practical sense, what institutions are actually being affected in those countries?

DS: So far, negative rates have been largely restricted to interactions between central banks and the large banks that deposit money with them. Banks are required to keep cash reserves to be able to meet requests for withdrawals. If you're a large bank, having cash physically stored at your bank is hugely expensive. You need a place to store it that's safe from fire, damage, and theft. So they deposit the cash at central banks such as the European Central Bank until they need to use it – just as American banks do with the Federal Reserve. And, since the financial crisis, banks reserve balances have increased dramatically, to levels well beyond what they are required to keep.

Policy makers have a specific objective here. They're trying to encourage those banks not to leave their cash sitting around, but to make more loans to businesses and individuals, where they can actually earn positive interest – and also stir growth.

Traditionally, central banks pay interest on those reserve deposits. With negative rates, the situation is reversed, and banks are paying the central bank to hold their money. Policy makers have a specific objective here. They're trying to encourage those banks not to leave their cash sitting around, but to make more loans to businesses and individuals, where they can actually earn positive interest – and also stir growth. At some point, banks could decide negative rates are too expensive, and invest in the infrastructure needed to store the money themselves. But at the moderately negative rates we've seen so far, they haven't reached that point.

OUTLOOK: Will negative rates filter down to businesses and retail bank clients?

DS: Banks have so far been reluctant to pass negative rates along to their customers, for fear of the bad publicity it would cause. In most of these countries, retail rates have stuck at very low numbers, but haven't gone below zero. Of course, if central banks push negative rates much lower, that could change.

OUTLOOK: But most retail consumers don't have to worry about the expense of storing billions of dollars. Wouldn't they just keep their money in a safe deposit box, or under the proverbial mattress?

DS: Even for individuals, there are inconveniences to holding cash. Two thousand dollars sitting around your house could be stolen, misplaced or damaged. And a stack of cash is problematic for transactions in the modern economy. I can't use money in the desk drawer to buy something online from Amazon. So I have a checking account, a credit card, a debit card. It's possible interest rates could go a bit negative even at the retail level, and people would hold onto those accounts for convenience.

In a sense, that's already happening. People who open checking accounts today are getting essentially no interest, maybe 0.1 percent. And many pay fees, for example, if they keep a low balance, or for using ATMs. If you factor the all-in costs, many people are already receiving the equivalent of a negative interest rate, even if it's not referred to as such. The big question with negative rates is, how long and how low would they have to go before people decide enough is enough and start to hold more cash? That's something we don't know.

SELECTED NEGATIVE YIELDS ON SIX-MONTH GOVERNMENT BONDS

Denmark	-0.41%
European Central Bank	-0.58%
Japan	-0.23%
Sweden	-0.73%
Switzerland	-0.80%

Source: Investing.com (as of 8/8/16)

OUTLOOK: Have negative rates succeeded in their mission of stimulating economies in the Eurozone and elsewhere?

DS: Policymakers and economists would say they've have been useful, though perhaps less than they initially hoped, because financial markets have taken negative rates as a sign that something really bad must be happening in these economies. That perception is more dangerous than the reality. For example, the money banks are paying central banks to store their cash has had only a small impact on their profits. But the impression that they are being hurt badly has had an adverse effect on European bank stocks. Poor stock performance in turn

makes it that much harder for banks to lend aggressively, which is what negative rates were supposed to accomplish in the first place.

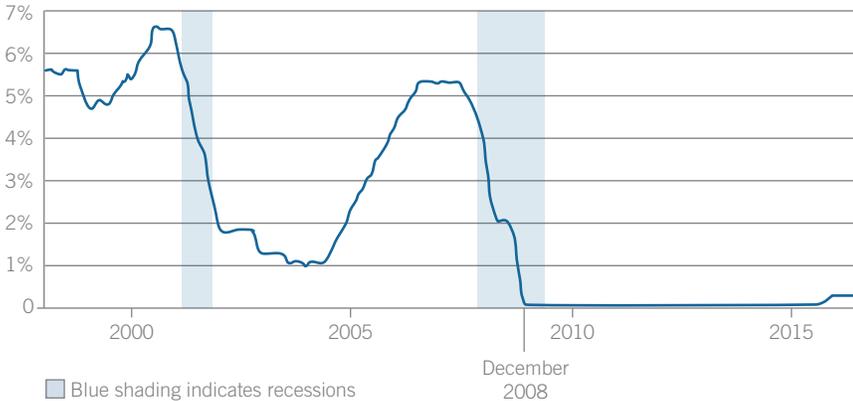
I'd put a lot of this on poor communication. Central bankers could do a much better job of educating investors and the public that going from 0 percent interest to negative .25 percent isn't really much different from going from 1 percent interest to .75 percent. In both cases, it's a drop of 25 basis points, more of a continuum than an earth-shattering departure. Negative rates are just another tool in policymakers' toolkits.

OUTLOOK: What are the chances we could see negative interest rates in the United States?

DS: I see that as very unlikely – not for philosophical reasons, but because our economy is performing well in comparison with those that have established negative rates. What would have to happen is we slip into another recession, and by that I don't mean one or two quarters of slightly negative growth. I think it would take a more significant downturn for the Federal Reserve to implement negative interest rates.

Instead, the consensus outlook for the U.S. economy is for steady, continued GDP growth. We've been running at about 2 percent growth for the past five years, which by historical standards is pretty sluggish, but it's still growth, and a far cry from recession. In fact, the Fed these days is very much focused on when it's going to raise rates further. That's really the current conversation between the Fed and financial markets.

EFFECTIVE U.S. FEDERAL FUNDS RATE



Source: St. Louis Fed

OUTLOOK: What makes our situation so different from Europe?

DS: That’s a great question, and one where you could get a lot of different answers from a lot of different economists. Certainly, there are many ways in which the U.S. economy is more dynamic than Europe’s, with more entrepreneurship and fluid financial markets. But if you think about the degree to which the U.S. has outperformed those countries, I think policy choices have been the main reason.

The Federal Reserve has been very aggressive about stimulating the economy. Europe, with the Greek debt crisis and events that followed, quickly pivoted to austerity, trying to restrain government spending. In the U.S. we had a milder pivot to austerity starting in 2010–2011, with all of the budget crises and battles between President Obama and the Republican Congress. That was not helpful, but it was modest in comparison to steps taken in Europe. We all think, oh, my gosh, the economy is so sluggish, why are things improving so slowly? But in comparison to Europe, we’re doing much better.

OUTLOOK: Why did Fed Chair Janet Yellen say earlier this year that she wouldn’t take negative rates off the table for the United States?

DS: I think Yellen was starting an education campaign, letting financial markets know that negative rates are a viable tool that central banks can use in certain scenarios. So if we do go that direction, people would be more familiar with the concept. Three or four years ago people would have said it could never happen. Now, economists and Fed bankers are saying, if the economy performs exceptionally poorly, this would be a tool they could use. Especially since there’s a growing feeling that they cannot get too much more bang for the buck out of other measures, such as quantitative easing.

Central bankers could do a much better job of educating investors and the public that going from 0 percent interest to negative .25 percent isn't really much different from going from 1 percent interest to .75 percent.

OUTLOOK: What would negative interest rates in the U.S. mean for agriculture and other industries?

DS: If I am correct that it would take a serious recession to bring negative rates to the United States, the problem wouldn't be negative rates, but the recession itself. That would be bad for agriculture and every other sector, especially since the economy is still so vulnerable. There are plenty of people who haven't gotten back everything they had before the financial crisis and the Great Recession.

If we do endure another recession, negative interest rates might be seen as a positive development, a sign that the Federal Reserve was taking steps to stimulate the economy. Of course, a lot would depend on how well the Fed had informed financial markets, the financial press, and the public about that possibility. That's why I mentioned Janet Yellen's education campaign earlier.

If that campaign succeeds to the point that people are comfortable with the idea that negative rates won't cause a sonic boom and wreck the economy, they might be greeted as a necessary step. If it hasn't succeeded, people would see negative rates as a really strange place to be. So Yellen and her colleagues have some work to do to get the public used to the idea, in the unlikely event we go that direction.

OUTLOOK: How do negative rates affect international trade?

DS: They tend to drive down the value of a currency, which makes a country's exports cheaper for international customers. That's one way in which negative rates in the U.S. might actually help industries such as agriculture that depend heavily on exports. There's probably been some benefit along those lines for countries that already have negative rates. But there's also been a lot of global market volatility, so it's hard to isolate out specific effects in a really concrete way.

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OUTLOOK: How will we ultimately look back on this era of negative rates – as an historical anomaly, or the new normal?

DS: For any economist, the standard answer to a question like that is: My crystal ball is broken. But I'll give it a shot. Sometime in the next 10 years the economy will return to what we think of as more normal performance. Productivity growth will pick up, and the economy will start to perform the way we were accustomed to having it perform before the financial crisis. We have slower population growth than during the 20th century and so the overall economy will be growing more slowly, but something like 2.5 to 3 percent GDP growth per year would be much better than we have now.

Today we look back at the Great Depression as an anomaly, but many economists of that period thought of stagnation as the new normal. A lot of people were terrified at the end of World War II that as government war spending wound down the economy would slip back into depression. But in fact, we were at the start of an historic boom. Bad things do happen in financial markets. And the historical record shows there's slow recovery following deep financial crises. But full recovery will come. And we will have learned an important lesson, that negative interest rates aren't the end of the world. ■

Interest Rates and Economic Indicators

The interest rate and economic data on this page were updated as of 7/31/16. They are intended to provide rate or cost indications only and are for notional amounts in excess of \$5 million except for forward fixed rates.

KEY ECONOMIC INDICATORS

Gross Domestic Product (GDP) measures the change in total output of the U.S. economy. The Consumer Price Index (CPI) is a measure of consumer inflation. The federal funds rate is the rate charged by banks to one another on overnight funds. The target federal funds rate is set by the Federal Reserve as one of the tools of monetary policy. The interest rate on the 10-year U.S. Treasury Note is considered a reflection of the market's view of longer-term macroeconomic performance; the 2-year projection provides a view of more near-term economic performance.

HEDGING THE COST OF FUTURE LOANS

A forward fixed rate is a fixed loan rate on a specified balance that can be drawn on or before a predetermined future date. The table below lists the additional cost incurred today to fix a loan at a future date.

FORWARD FIXED RATES

Cost of Forward Funds

Forward Period (Days)	Average Life of Loan			
	2-yr	3-yr	5-yr	10-yr
30	5	5	5	5
90	5	8	8	8
180	5	9	12	12
365	9	17	24	22

Costs are stated in basis points per year.

ECONOMIC AND INTEREST RATE PROJECTIONS

Source: Insight Economics, LLC and Blue Chip Economic Indicators

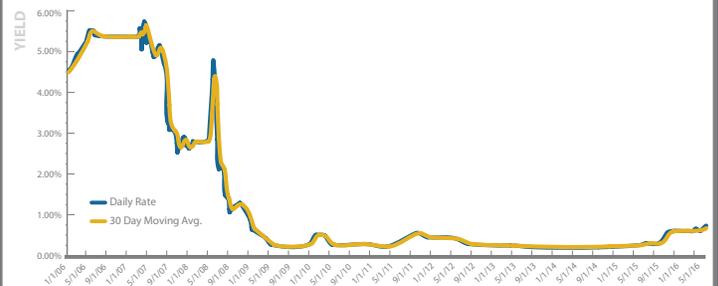
US Treasury Securities

2016	GDP	CPI	Funds	2-year	10-year
Q3	2.20%	2.20%	0.41%	0.65%	1.49%
Q4	2.20%	2.20%	0.44%	0.78%	1.66%
2017	GDP	CPI	Funds	2-year	10-year
Q1	2.20%	2.20%	0.48%	0.94%	1.83%
Q2	2.30%	2.40%	0.52%	1.10%	1.95%
Q3	2.20%	2.30%	0.54%	1.23%	2.07%

SHORT-TERM INTEREST RATES

This graph depicts the recent history of the cost to fund floating rate loans. Three-month LIBOR is the most commonly used index for short-term financing.

3-MONTH LIBOR



PROJECTIONS OF FUTURE INTEREST RATES

The table below reflects current market expectations about interest rates at given points in the future. Implied forward rates are the most commonly used measure of the outlook for interest rates. The forward rates listed are derived from the current interest rate curve using a mathematical formula to project future interest rate levels.

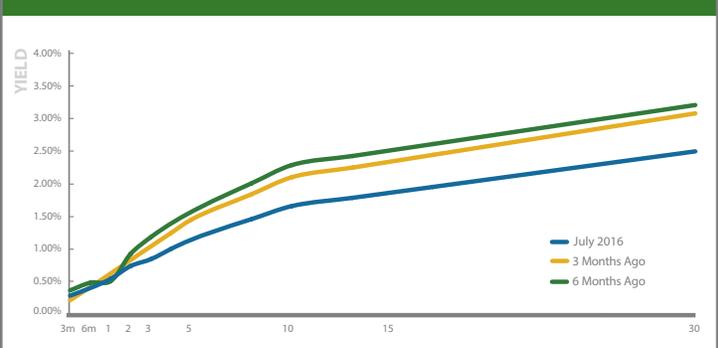
IMPLIED FORWARD SWAP RATES

Years Forward	3-month LIBOR	1-year Swap	3-year Swap	5-year Swap	7-year Swap	10-year Swap
Today	0.78%	0.86%	0.98%	1.11%	1.25%	1.43%
0.25	0.87%	0.88%	1.00%	1.13%	1.27%	1.45%
0.50	0.87%	0.91%	1.04%	1.17%	1.31%	1.48%
0.75	0.92%	0.96%	1.07%	1.21%	1.35%	1.52%
1.00	0.92%	0.98%	1.09%	1.24%	1.37%	1.53%
1.50	0.97%	1.03%	1.17%	1.32%	1.45%	1.61%
2.00	1.03%	1.08%	1.22%	1.37%	1.50%	1.64%
2.50	1.10%	1.15%	1.30%	1.44%	1.56%	1.69%
3.00	1.16%	1.22%	1.38%	1.51%	1.62%	1.74%
4.00	1.31%	1.37%	1.53%	1.64%	1.72%	1.83%
5.00	1.48%	1.54%	1.65%	1.78%	1.83%	1.90%

RELATION OF INTEREST RATE TO MATURITY

The yield curve is the relation between the cost of borrowing and the time to maturity of debt for a given borrower in a given currency. Typically, interest rates on long-term securities are higher than rates on short-term securities. Long-term securities generally require a risk premium for inflation uncertainty, for liquidity, and for potential default risk.

TREASURY YIELD CURVE





About CoBank

CoBank is a \$125 billion cooperative bank serving vital industries across rural America. The bank provides loans, leases, export financing and other financial services to agribusinesses and rural power, water and communications providers in all 50 states. The bank also provides wholesale loans and other financial services to affiliated Farm Credit associations serving farmers, ranchers and other rural borrowers in 23 states around the country.

CoBank is a member of the Farm Credit System, a nationwide network of banks and retail lending associations chartered to support the borrowing needs of U.S. agriculture, rural infrastructure and rural communities. Headquartered outside Denver, Colorado, CoBank serves customers from regional banking centers across the U.S. and also maintains an international representative office in Singapore.

For more information about CoBank, visit the bank's web site at www.cobank.com.

CoBank Reports Second Quarter Financial Results

CoBank has announced its financial results for the second quarter and first six months of 2016. The bank's net income for the second quarter increased 5 percent to \$243.3 million, compared to \$232.3 million in the second quarter of 2015. For the first six months of 2016, net income was \$486.6 million, a 5 percent increase from \$464.6 million in the same period last year. The increases in earnings primarily resulted from higher net interest income, partially offset by higher provisions for loan losses, increases in operating expenses and lower overall noninterest income in the 2016 period.

Net interest income for the second quarter was \$345.9 million, a 12 percent increase compared to \$309.4 million in the same period last year. For the first six months of the year, net interest income increased 9 percent to \$682.8 million, compared to \$624.6 million for the first six months of 2015. The increases in net interest income were primarily driven by higher average loan volume and increased earnings on balance sheet positioning, somewhat offset by spread compression in the bank's loan portfolio due to continued strong competition and a higher cost of short-term debt.

Average loan volume rose 14 percent in the second quarter to \$92.4 billion, from \$81.1 billion in the same period last year. For the first six months of 2016, average loan volume rose 13 percent to \$91.1 billion, from \$80.9 billion in the same period last year. The increases resulted from higher levels of borrowing from affiliated Farm Credit associations, agricultural cooperatives, other food and agribusiness companies, rural electric cooperatives, and rural communications service providers.



Robert B. Engel

"We're pleased with both the quarterly and year-to-date results of our business, including solid growth in our portfolio across all of our operating segments," said Robert B. Engel, CoBank's chief executive officer. "In addition to loan growth, CoBank's profitability, credit quality and liquidity all remain strong. Most importantly, the bank continues to fulfill its mission by providing dependable credit and financial services to rural industries."

At quarter-end, 0.63 percent of the bank's loans were classified as adverse assets compared to 0.71 percent at March 31, 2016. Nonaccrual loans decreased to \$115.4 million at June 30, 2016 from \$212.8 million at March 31, 2016. The bank's allowance for credit losses totaled \$628.3 million at quarter-end or 1.32 percent of non-guaranteed loans when loans to Farm Credit associations are excluded.

Capital levels remain well in excess of regulatory minimums. As of June 30, 2016, shareholders' equity totaled \$8.6 billion, and the bank's permanent capital ratio was 14.9 percent, compared with the 7.0 percent minimum established by the Farm Credit Administration (FCA), the bank's independent regulator.

During the quarter, the bank redeemed at par plus accrued interest all of its outstanding 7.875 percent subordinated notes due in 2018, totaling approximately \$405 million. The bank also issued \$375 million in preferred stock. The new Series I non-cumulative perpetual preferred stock has a fixed dividend rate of 6.25 percent until October 1, 2026, after which the dividends will accrue at a floating rate.



David P. Burlage

“We continue to monitor the capital markets and capital regulations in order to optimize the effectiveness, quality and cost of our third-party capital, which enhances our lending capacity and our ability to serve the borrowing needs of our customers,” said David P. Burlage, CoBank's chief financial officer.

At quarter-end, the bank held approximately \$30.5 billion in cash and investments and had 200 days of liquidity, which was in excess of FCA liquidity requirements.

Engel noted that, despite strong financial results in the first half of the year, the bank continues to face challenges that have the potential to negatively impact earnings and overall financial performance over the balance of the year.

“CoBank's margins remain under pressure due to historically low interest rates as well as intense competition in the banking and finance industries for the business of our customers,” Engel said. “In addition, it is possible we will see deterioration in credit quality as a result of lower commodity prices, a stronger dollar and other economic and geopolitical events or trends that impact many of our borrowers.

“Nonetheless, we remain highly confident in the overall financial condition of CoBank and in our ability to meet the needs of our customers. We continue to focus on building the long-term strength of the organization and on fulfilling our vital mission in rural America.” ■