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Economic Research:

Should The Fed Consider Income Inequality When Setting Monetary Policy?

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Economic Research:

Should The Fed Consider Income Inequality When Setting Monetary Policy?

Perhaps the biggest criticism of the Federal Reserve's response to the recent financial crisis--specifically regarding its asset-purchasing program known as quantitative easing (QE)--is that it exacerbated the country's already historic level of income inequality.

But should the potential widening of the wealth gap be a consideration for central bankers when they set monetary policy?

The answer to that question--if there is one--is less than straightforward. But one thing is certain: While it's true that the short-term effects of QE (and the loosening of monetary policy overall) likely helped those at the top more than others, the longer-term benefits have been more widespread. In fact, we calculate that without the third round of QE that the Fed implemented in the fourth quarter of 2012, about 1.9 million fewer jobs would have been added to the world's biggest economy, and, using Okun's Law, U.S. real GDP would have been \$350 billion lower.

Overview

- Amid ample evidence that increased wealth concentration may make monetary policy less effective, the economists at S&P Global Ratings don't believe it's prudent for the Fed to consider the impact of monetary policy on income inequality--but, rather, that it would be wise for central bankers to consider the impact of income inequality on monetary-policy effectiveness.
- Because the effects of monetary policy vary, it would be unreasonable to expect a loosening of monetary policy to benefit everyone equally--and the fact that moves such as QE might improve the lot of some more than others is hardly a reason for central banks not to do their basic job of supporting the macro economy.
- The Fed's "dual mandate" is to stabilize inflation and to maximize employment, and the central bank's moves in the wake of the Great Recession supported greater economic stability and prosperity for the overall economy. Without the third round of quantitative easing that the Fed implemented in 2012, about 1.9 million fewer jobs would have been added to the economy than we saw last year. Using Okun's Law as a rule of thumb, U.S. real GDP output from 2013-2015 would have been \$350 billion lower.
- Given the Federal Open Market Committee's (FOMC) lower estimated "neutral rate," policymakers have less room to use traditional monetary policy during a downturn, suggesting that QE (or another alternative form of easing) may still be in the cards.

The Federal Reserve has stopped adding to its stock of QE, but recent comments by Chair Janet Yellen and other Fed members suggest that their bond-buying program may not be a thing of the past (1). After the two-day FOMC meeting in June, Ms. Yellen noted that the so-called neutral federal funds rate (the level consistent with the economy operating at full employment, with price stability) is lower than before. In fact, the FOMC's median estimated neutral rate of 3% is a full percentage point lower than its estimated historic average. Ms. Yellen said this lower neutral rate "may be closer to the new normal." If so, this means policymakers have less room to use their traditional monetary-policy tool

during a downturn, suggesting that QE (or another alternative form of easing) may still be in the cards.

A closer look at the difficulties the Fed faced bolsters the argument that the central bank did the right thing in playing the wild card of QE in its effort to pull the country out of its worst economic slump since the Great Depression. This is especially true given the horrible hand policymakers had been dealt, not only because of what happened during the crisis, but because of conditions in the years preceding it.

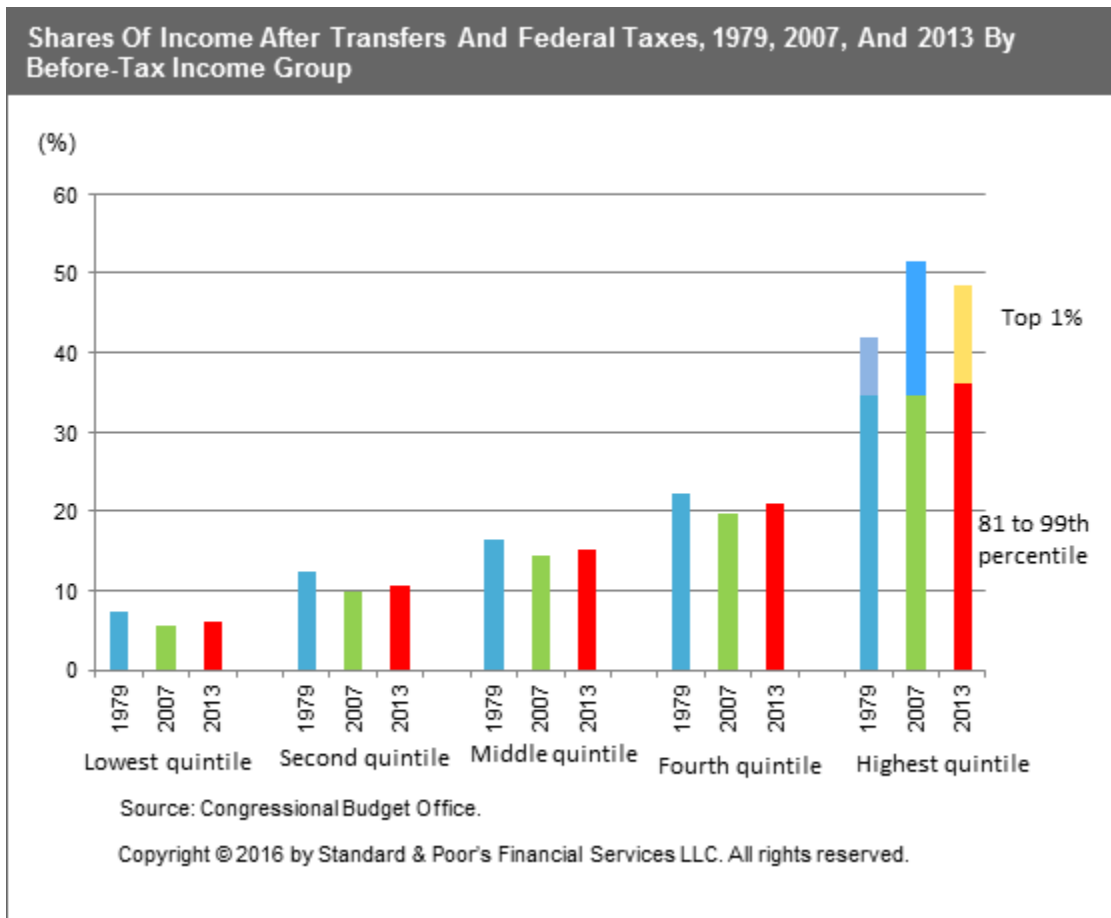
Leading up to the Great Recession, the confluence of a housing bubble that inflated (and burst) with wide regional variation; changes over time in federal tax and spending policies and so-called job polarity that made for expanding opportunities at the high and low ends of the skill and wage spectrum, while the middle contracted; and an already widening wealth gap meant that the primary tool at the central bank's disposal--the federal funds rate--would prove inadequate for the job of spurring an economic recovery.

Under normal conditions, lower borrowing costs tend to spur consumer spending (and, therefore, economic activity), taking into account the "marginal propensity to consume," or the proportion of each additional dollar of household income that consumers lay out rather than sock away. But, as Robert Reich, former Secretary of Labor and Professor of Public Policy at the University of California, Berkeley, has argued, increased inequality has likely reduced overall aggregate demand, with high-income households having a lower marginal propensity to consume than those further down the economic ladder.

This is particularly problematic because the U.S. is in the midst of a period of historically high income and wealth inequality. According to the Organization for Economic Cooperation and Development (OECD), the average income of the richest 10% of Americans is 19 times that of the poorest 10% (data as of 2013), making the U.S. rank third in income inequality by this measure among advanced nations, with only Mexico and Chile having more unequal income distributions (2).

And while the latest report (June 2016) from the Congressional Budget Office (CBO) showed that real net average aftertax U.S. household income grew 59% from 1979-2013, that growth was much greater at the higher end of the income scale than in the middle and at the lower end (3). Here, real net average U.S. household income grew by 192% for the top 1%, over four times average income gains seen for the bottom 80% of households over the same period. The CBO report showed that aftertax average income soared 15.2% for the top 1% from 2009-2010, but fell 3.2% from 2010-2013. In contrast, income growth from 2009-2010 and 2010-2013 was more or less flat on average for the bottom 90% (4). In 2013, aftertax income concentration stabilized some. While below 1979 readings, the percent share for the bottom four quintiles were all above their 2007 percent shares. The share of aftertax income for the highest quintile fell by 2.9 points to 48.5%, though, according to the CBO, this was likely because some taxpayers shifted some income into 2012 to avoid higher tax rates on that income in 2013.

Chart 1



Disparity In The "Marginal Propensity To Consume"

Certainly, some inequality is to be expected in a market economy; it can help to keep the economy functioning effectively, incentivizing investment and expansion. However, too much inequality can undermine growth by increasing political pressures, and discouraging trade, investment, and hiring. Famed British economist John Maynard Keynes showed that widening wealth inequality brought on by a top-heavy distribution of income leads to increases in aggregate savings and would curb aggregate consumption (hence effective demand), and thus crimp economic expansion (5). Those with less means often increase borrowing to sustain consumption--that is, until these imbalances can no longer be sustained, and the economy suffers a boom and bust cycle such as the one that culminated in the Great Recession.

At the same time, it would be unreasonable to expect a loosening of monetary policy to benefit everyone equally, given the substantial heterogeneity across households in their consumption response. Simply put, changes in monetary policy may have very different effects depending on the distribution of indebtedness across households.

In particular, quantitative easing on its own is generally more beneficial to those in the middle and at the higher end of

the income ladder. Given that a plurality of Americans are in the middle class (upwards of two-thirds of households, depending on the definition), this isn't necessarily a bad thing. Nor is it in itself unusual. What was different this time around was that low-income and middle-class households were so squeezed leading up to the crisis that they couldn't take advantage of looser monetary policy afterward--by refinancing their mortgages, for example. Or, to quote the New York Times Oct. 22, 2014, article: "if you're General Electric or Kohlberg Kravis Roberts, getting a loan from a bank is no problem; if you want to buy a new house in Peoria, good luck to you."

In other words, the distributional channels were less effective because of increased wealth concentration. A big reason lower-income households struggled so much is that their home prices fell further in the crisis than homes in wealthier neighborhoods did, and their values haven't yet fully returned.

To be sure, QE did lead to a boom in mortgage originations. But, according to a report in June of last year from the New York Fed, "essentially all of the increase in mortgage activity occurred with households refinancing their existing mortgage, as opposed to originating new mortgages for home purchases"--with high-income households "more likely to refinance in response to interest-rate reductions than ... low-income households." (6) Unable to refinance into lower interest rates, heavily indebted homeowners ultimately spent less.

Along these lines, research conducted in 2013 by Amir Sufi, finance professor at the University of Chicago Booth School of Business and research associate at the National Bureau of Economic Research, along with economists Atif Mian and Kamalesh Rao, found that the marginal propensity to consume (MPC) for households with an average annual income of less than \$35,000 to be three times larger than the MPC for households with average income over \$200,000 (7). They also found that, as home values ballooned in the run-up to the crisis, low-income households very aggressively borrowed (in many cases, against increased home equity) and spent, while high-income households were less responsive. Naturally, when housing wealth and incomes tumbled (or disappeared), the cutback in spending by low-income households was twice as large as that for rich households.

Additionally, 70% of borrowers with a 30-year fixed-rate mortgage were reportedly paying an interest rate of 5% or more, as of March 2012, despite the fact that market rates were only 3.8% (8). Here, Mr. Sufi later said in his Andrew Crockett Memorial Lecture that "given elevated debt burdens and frictions in the refinancing process, monetary policy faces severe impediments in delivering lower rates to exactly the homeowners that would boost spending the most." (9) This was despite the Fed taking its traditional monetary policy rate down to historic lows of near-zero.

Like Trying To Juggle With Tied Hands

Certainly, when income concentration reaches extreme levels, the damage can be severe. Americans with less money to spend on themselves and their children means curtailed economic activity in the long-term and lost social mobility--unless, of course, those households rely on debt, which the Great Recession made clear isn't sustainable. The damage is not just to those households struggling to make ends meet, but to society as a whole (see "How Increasing Income Inequality Is Dampening U.S. Economic Growth, And Possible Ways To Change The Tide," published Aug. 5, 2014, on RatingsDirect).

In this light, many argued that the Fed should have taken inequality into account when setting policy. But while we

acknowledge that extreme income concentration and reduced social mobility for those at the bottom are serious issues, we question whether there is even any way to factor this into a proper monetary policy solution. The Fed's "dual mandate" is to promote stable prices and maximum employment. If increased income concentration doesn't factor into these mandates, there would therefore be no reason for the central bank to change monetary policy. Moreover, there's ample evidence that increased income concentration may distort the impact of monetary policy, making it less effective in the end.

As such, we don't believe it's prudent for the Fed to consider the effects of monetary policy on income inequality *per se*--but, on the contrary, central bankers would be wise to consider the impact of income inequality on the effectiveness of monetary policy. Given that the Fed now sees a lower neutral rate, it may need to keep QE and other alternative forms of monetary policy under consideration.

Either way, policymakers have shown that they are at least aware and concerned about the wealth gap and its various manifestations--particularly with regard to unemployment levels. In her report to Congress after the June meeting, at which the FOMC held the benchmark federal funds rate at 0.25%-0.50%, the Fed chair highlighted the fact that unemployment remained widespread among minorities and lesser-educated people.

Ms. Yellen stressed that gains from the ongoing (albeit slow) economic recovery haven't been widely shared--and that while diverging economic circumstances between white and black households predate the financial crisis, the situation worsened significantly in the wake of the crisis and have only minimally improved since.

It is "troubling that unemployment rates for these minority groups remain higher than for the nation overall, and that the annual income of the median African-American household is still well below the median income of other U.S. households," she said. This is not new domain. Chair Yellen discussed income inequality in her October 2014 speech. And in, April 2015, her speech on economic mobility noted that income inequality has long been of interest within the Federal Reserve System, pointing to a 2007 speech by then-Chairman Ben Bernanke on the matter.

At any rate, the inequality gap--with regard to both income and wealth--has been decades in the making. This suggests that it has more to do with profound structural changes that have occurred in the past half-century, including demographic shifts, taxation and government spending policies, technological gains, institutional change in the labor market, and education, among others. As former Fed Chair Bernanke noted, "by comparison to the influence of these long-term factors, the effects of monetary policy on inequality are almost certainly modest and transient," with most economists in agreement that monetary policy is "neutral" for the most part, over the long run, with a limited "real" impact on the distribution of income and wealth (10).

Furthermore, the Fed's moves in the wake of the Great Recession had positive effects on many aspects of society, and not just for the privileged few. When correctly managed, Fed policies support greater economic stability and prosperity for the overall economy. In other words, as the pie grows, everybody gets a bigger slice (though, we acknowledge that the distribution of this bigger pie may, too, be unequal). And, even if it were true that effective monetary policy might strengthen financial conditions for some more than others, forgoing such policies would be throwing the baby out with the bath water.

Meanwhile, other types of policies that promote growth, such as fiscal policies on taxation and government spending,

could be more effective over the long haul. As Mr. Bernanke said, perhaps reflecting on his time as Fed chair, "if fiscal policy makers took more of the responsibility for promoting economic recovery and job creation, monetary policy could be less aggressive." (11)

A Difference Of 1.9 Million Jobs

From the start, the Fed's main reason for sailing into uncharted waters aboard QE was the struggle it had faced in jump-starting the U.S. jobs machine once it had exhausted its traditional policy tool, the federal funds rate. In general, easier monetary policy stimulates job creation and increases asset prices--and a stronger jobs market signals higher wages down the road. Given that job creation was essentially nil and prices were stagnant (contrary to the Fed's "dual mandate"), policymakers decided to enter this new terrain.

The subsequent significant improvement in the U.S. labor market is among the surest signs that the Fed's actions did, indeed, support the macro economy. The headline unemployment rate, which peaked at 10% in late-2009, has narrowed by more than half, reaching 4.9% in July--in line with the prerecession level and the Fed's latest estimate of the long-run normal unemployment rate of 4.7%-5%. (Granted, low headline unemployment is due in part to historically low labor-market participation. Nonetheless, the totality of the data still suggest the economy is moving closer to full employment, albeit slowly.)

A stronger labor market benefits everyone. In a paper in June of last year, Josh Bivens, Research and Policy director for the Economic Policy Institute, concluded that monetary stimulus "doesn't necessarily increase inequality," noting that it has "cross-cutting effects" where if, for example, home prices were boosted more than equity prices, Fed action would have a progressive effect on wealth distribution (12). He added that concerns that the Fed's expansionary stance exacerbated the long-running trend toward greater income inequality seem "misplaced," given that the "scale of any regressive effects stemming from efforts to engage in expansionary monetary policy" is much smaller than critics claim.

Further, he asserted that positive employment effects are "by far the largest impact of monetary policy changes on inequality." Or, as Mr. Bernanke wrote in a paper last year for the Brookings Institution, "[p]erhaps most important, easier monetary policies promote job creation as well as increases in asset prices. A stronger labor market--more jobs at better wages--obviously benefits the middle class, and it is the best weapon we have against poverty." (13)

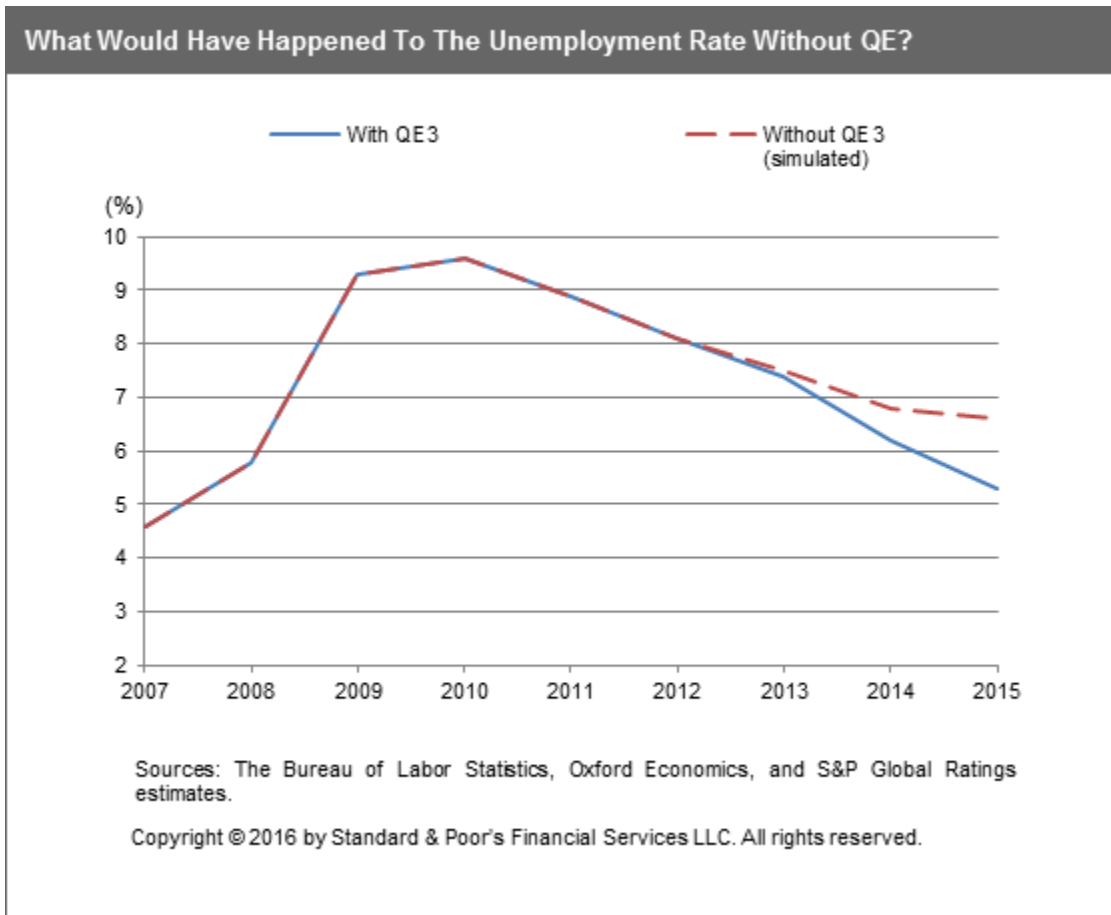
When the Fed began buying assets under its QE program--eventually boosting its holdings of Treasury notes and bonds, along with agency MBS and agency, debt to more than \$4 trillion, from around \$500 billion prior to the financial crisis--it did so to put downward pressure on long-term interest rates. By that measure, the move was a success, as borrowing costs for residential mortgages, auto loans, and business spending declined. This, in turn, boosted home prices and the value of financial assets. And, given home equity reportedly makes up around 50% of household wealth for the middle class, the Fed's QE program gave the so-called "backbone of America" a boost.

It wasn't until the implementation of QE3 in the fourth quarter of 2012 that the economy began to see a notable pick-up in aggregate macroeconomic outcomes outside of the stock markets and despite the fiscal drag, with the private sector driving the expansion. QE 3 was distinctly different in its approach compared with its predecessors, as

the Fed switched to an open-ended approach, intending to buy a set amount of assets (Treasuries and mortgage-backed securities) per month until attainment of its objectives was in sight. This punctuated the central bank's intention that easing was here to stay, pushing longer term interest rates further down. It was only then, after 2012, that businesses started hiring at a sustained faster pace, households started to see their balance sheets improve further because of rising equities and home prices, household incomes started to stabilize and tick higher, and consumer spending improved measurably.

In this light, S&P Global Ratings ran a simple macroeconomic counterfactual exercise to gauge what would have happened if the Fed hadn't embarked on QE3. In our Oxford Economics general equilibrium model, QE is an exogenous variable that feeds into bond yields and the credit conditions measure. We found that about 1.9 million fewer jobs would have been created, implying an unemployment rate 1.3 percentage points higher than last year's, and, using Okun's Law as a rule of thumb, U.S. real GDP output from 2013-2015 would have been \$350 billion lower (14).

Chart 2



By that measure, QE3 worked. As Mr. Bernanke put it: "If the average working person were given the choice of the status quo (current Fed policies) and a situation with both a weaker labor market and lower stock prices (tighter Fed policies), which would he or she choose?" (15)

Adverse Effects That Never Materialized

Even in normal times, when the FOMC lowers interest rates, it opens itself up to blame from consumers who now collect less interest on their savings accounts or pay higher prices at the mall once the move has the desired effect of boosting inflation. On the other hand, when the Fed raises interest rates, borrowers lament every time they take out a loan or pay a credit card bill.

Regarding the Great Recession, the standard criticism of the Fed had been that policymakers were "behind the curve," or "out of bullets," or simply "ineffective." More specifically, naysayers asserted that the Fed's efforts to pull the U.S. economy back from the brink of disaster left the country exposed to the risk of hyperinflation, while the lower yields earned on U.S. assets would make foreigners less willing to hold them, thus weighing on the dollar. And with a marked acceleration in inflation, policymakers would then be forced to raise benchmark rates much faster than they otherwise would, stalling the recovery.

But, as Charles Goodhart, noted economist and former policymaker at the Bank of England, put it: "Had you asked, say, back in 2005, what would be the effect of a central bank increasing the reserve base of its banking system by a factor of 10 times, most respondents would have predicted massive expansion of bank credit, of the money stock, of nominal gross domestic product, and of inflation.

"Yet none of this has happened," he wrote in a 2015 paper titled "Why Monetary Policy Has Been Comparatively Ineffective." (16)

Indeed, most of these adverse results remain hypothetical. Inflation is quite tame, with the Personal Consumer Expenditures (PCE) deflator below the Fed's target of 2% year over year, the dollar is near its strongest level in a dozen years against a basket of major currencies, and the headline unemployment rate is less than half its recent peak.

That hasn't stopped some critics from calling QE a new version of trickle-down economics. Older Americans have seen their interest incomes dwindle, and many can no longer get loans. The view that the Fed "bailed out Wall Street" certainly hasn't helped policymakers win many popularity contests on Main Street. Indeed, echoing what is now century-old criticism, many members of Congress have called for the Fed to be audited--or, in the case of former Texas Republican Rep. Ron Paul, to be abolished (17).

Not that the Fed has ever has it easy. More or less ever since President Woodrow Wilson signed the act that created it, in December 1913, the U.S. central bank has been accused of incompetence at best and nefarious dealings at worst. In any event, the current bashing pales in comparison to the harshest anti-Fed sentiments, which include that from Rep. Louis T. McFadden, the Pennsylvania Republican who chaired of the House Committee on Banking and Currency from 1920-1931, who blamed the Fed for causing the Great Depression--intentionally! (18)

While famed economists Milton Friedman and Anna Schwartz stopped short of saying the central bank brought the U.S. economy to its knees on purpose, they did say that the Fed pursued an erroneously restrictive monetary policy that exacerbated the Depression--an argument that has since found many supporters (19). Among them is Mr. Bernanke, who said, in a November 2002 speech honoring Mr. Friedman on his 90th birthday, "I would like to say to

Milton and Anna, regarding the Great Depression: You're right, we did it. We're very sorry. But thanks to you, we won't do it again." (20)

But did the Fed do it again by bringing about (or at least worsening) the most recent financial crisis and recession? S&P Global economists don't believe so. It's more likely that conditions before and during the crisis meant that the Fed, with its mandate to "promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates" simply lacked the monetary-policy power to prop up the economy as forcefully as critics would have liked.

A "Highly Doubtful Proposition"

Monetary policy works by influencing financial conditions--e.g., the availability of credit, as well as effects on various interest rates and asset prices--and, as such, typically has some distributional effects. As S&P Global Chief Economist Paul Sheard noted in 2014, because QE worked more through its effects on asset prices, relative to conventional monetary policy, these distributional impacts may have more pronounced than usual (see "A QE Q&A: Everything You Ever Wanted To Know About Quantitative Easing," published Aug. 7, 2014).

"QE, while being good for the economy overall, may have disproportionately benefited the holders of existing financial assets (stocks and bonds)--the relatively wealthy--and so may well have exacerbated income inequality," Mr. Sheard wrote. "But, unless it was the case that any such increase in income inequality could be shown to have a negative impact on real GDP growth of a magnitude that outweighed the positive effects on growth of the monetary easing--a highly doubtful proposition--the fact that monetary policy might improve the lot of some more than others is hardly a reason for central banks not to do their basic job: support the macro economy."

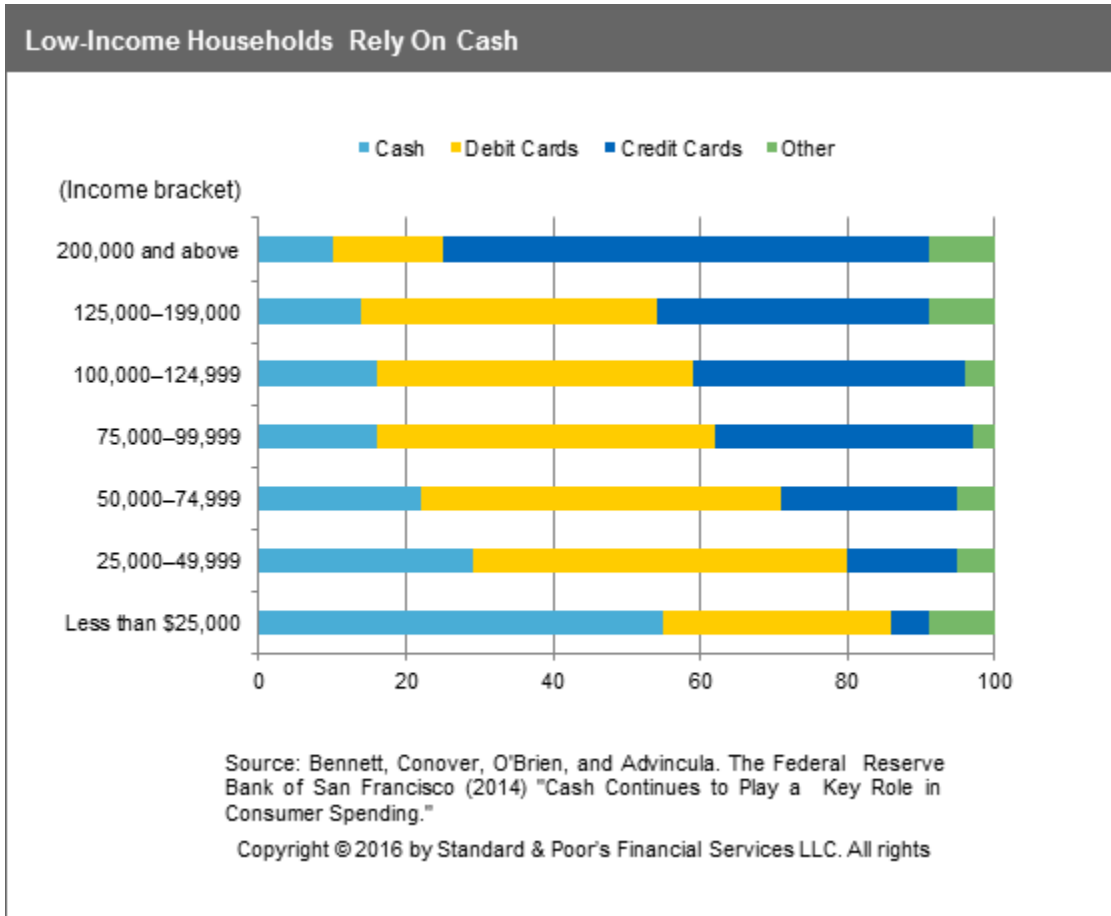
Given that monetary easing such as QE works by raising the price of assets such as stocks, it's hard to deny that Fed policy has been selective in the benefits it bestowed. Since more assets are held by the rich than by others, it can be argued that they reaped more rewards than others, thus increasing the concentration of wealth in the U.S. The benchmark S&P 500 Index once again flirting with its all-time high makes this an easy argument to articulate.

But consider that, in the wake of the Great Recession, it took years for benchmark indices to bounce back to their precrisis levels. Indeed, Mr. Bernanke and other Fed members have argued that policy actions have only returned stock prices to trend. Backing up this assertion is the fact that the S&P 500 didn't again close above its 2007 peak until March 28, 2013. In fact, if the index had simply continued to rise at its historical annual average growth rate of 9.5% (as per the geometric mean from 1928-2015), it would now be approximately 50% higher than its current level of around 2,150 (21).

Granted, not everyone benefited from higher asset prices. Americans at or near the bottom of the income ladder hold relatively few assets, and thus didn't reap the rewards of Fed easing. And while borrowers, who are often poorer than creditors, benefit from QE-driven higher prices, the fact that the typical rate for a 30-year, fixed-rate mortgage fell to 3.5% in 2013, from 5.3% in 2010, and interest rates on new-vehicle loans fell to 4.7%, from 6.5%, meant little to consumers who couldn't afford to buy a house or car--or find a lender to finance such purchases, even if they could make the payments. (Note, too, that lower benchmark borrowing costs obviously have more of an immediate effect on

variable-rate mortgages, and that an estimated 85% of U.S. homeowners get 30-year fixed-rate loans.)

Chart 3



Moreover, higher inflation damages poorer households in another way: Given that they keep a comparatively larger portion of their money in cash, whose value suffers from inflation, the dollar they earned today will be worth less tomorrow.

A Better Deal Down The Road

Either way, the greatest benefits of the Fed's unconventional measures may be yet to come. After all, the effects of changes in monetary policy are rarely immediate. And, under the "rising tide lifts all boats" rubric, we've seen a number of signs that Fed policy will ultimately play out in a way that's beneficial to Americans across the income spectrum.

The June and July payrolls report confirmed what S&P Global Ratings already believed: May's disappointing payroll gains of just 24,000 overstated the weakness in the jobs market. May's numbers didn't jibe with record-high job openings, layoffs that are still near record lows, increased growth in income-tax withholdings, and a rebound in consumer demand/sentiment. The 274,000 monthly average jobs added in June and July made that clear. And while

monthly average job gains are trending lower, the three-month average, at around 190,000, is in line with a maturing labor environment, when jobs tend to be added at a slower pace.

That said, there's clear evidence that the pace of employment gains has slowed in the past few months. Job growth April-July averaged 173,000, compared with 197,000 in the first three months of the year and 229,000 in 2015. The May report, particularly, was unwelcome news for FOMC members, who had been looking for evidence that would validate an interest-rate hike. While the upbeat June and July reports helped allay fears of a slowdown, and wage growth has started to show some signs of picking up, there is still no evidence of overheating. In fact, the first half of 2016 saw an underwhelming real GDP growth pace of an average 1%, which is below estimates of what the Fed considers trend growth pace. Add to that the unforeseen ramifications of the Brexit referendum on the U.S. economy that will need to be considered before the Fed decides to increase rates.

Whether or not the Fed has drawn a better hand than it has held during the crisis, policymakers are still surely a few face cards shy of a royal flush. Mr. Sufi has pointed to what he called the "monetary policy asymmetry predicament"--under which keeping interest rates historically low doesn't significantly boost consumption, while raising rates would likely weigh on household spending (22). In short, the negative effects of raising rates are greater than the positive effects of lowering them.

In this light, high-income and low-income individuals respond very differently to changes in monetary policy, as do savers and borrowers. Monetary policy affects the economy primarily through redistribution channels that require an appreciation of differences among households.

Mr. Sufi said that, in advanced economies such as the U.S., monetary policy has been especially weak in the past seven years because the redistribution channels of monetary policy have been severely hampered.

In other words, this could still be a tough hand for the Fed to win.

Writer: Joe Maguire

Endnotes

(1) In addition to recent comments from Chair Yellen on the low neutral rate, Fed Governor Lail Brainard said in her speech on Dec. 1, 2015 at the Stanford Institute for Economic Policy Research: "when the adverse shocks to demand are sufficiently severe to push the nominal neutral interest rate substantially below zero, as they were during the Great Recession, monetary policy confronts the zero-bound constraint... That is why monetary policymakers ... have been compelled to use additional unconventional tools..., such as forward guidance and asset purchases." San Francisco President John Williams report on Aug. 15, 2016, "Monetary Policy in a Low R-star World" also recognized that "the world must be able to adapt policy to changing economic circumstances..., specifically those related to a low natural real rate of interest."

(2) OECD (2015). "In It Together: Why Less Inequality Benefits All," OECD Publishing, Paris.

(3) "The Distribution of household Income and Federal Taxes, 2013." CBO, June 2016.

(4) Ibid

(5) "The General Theory of Employment, Interest, and Money" J.M. Keynes, 1936, Chapter 24.

(6) "Regional Heterogeneity and Monetary Policy," M. Beraja, A. Fuster, E. Hurst, J. Vavra, New York Federal Reserve, June 2015.

(7) Mian, Rao, and Sufi (2013). "Household Balance Sheets, Consumption, and the Economic Slump," Oxford University.

(8) Alan Boyce, Glenn Hubbard, Chris Mayer, and James Witkin, "Stream-lined Refinancings for Up to 13 Million Borrowers," draft policy proposal, 2013.

(9) Amir Sufi (2015). "Out of Many, One? Household Debt, Redistribution, and Monetary Policy during the Economic Slump," Andrew Crockett Memorial Lecture.

(10) Ben Bernanke (2015). "Monetary Policy and Inequality," The Brookings institution, The Hutchinson Center on Fiscal and Monetary Policy.

(11) Ibid

(12) "Gauging The Impact Of The Fed On Inequality During The Great Recession," J. Bivens, Hutchins Center on Fiscal & Monetary Policy at Brookings.

(13) Ben Bernanke (2015). "Monetary Policy and Inequality," The Brookings institution, The Hutchinson Center on Fiscal and Monetary Policy.

(14) Engen, Laubach, and Reifschneider of the Federal Reserve Board (2015) in "The Macroeconomic Effects of the Federal Reserve's Unconventional Monetary Policies," find a peak unemployment effect—subtracting 1.25 percentage points from the unemployment relative to what would have occurred in the absence of the unconventional policy actions that occur in early 2015. They use the FRB/US model to assess the actual economic stimulus provided by unconventional policy since early 2009.

(15) Ben Bernanke (2015). "Monetary Policy and Inequality," The Brookings institution, The Hutchinson Center on Fiscal and Monetary Policy.

(16) Charles Goodhart (2015). "Why Monetary Policy has been Comparatively Ineffective?"

(17) Congressman Thomas Massie (R-KY) introduced the Federal Reserve Transparency Act, H.R. 24 in the 114th Congress on Jan. 6, 2015. An early version, H.R. 1207, was introduced by Ron Paul during the 111th Congress. See also "End the Fed," Ron Paul, Grand Central Publishing, 2009.

(18) "Congressional Record June 10, 1932, Louis T McFadden" June, 10, 1932. See also "Criticism of the Federal Reserve," Wikipedia.

(19) Friedman, Milton; Schwartz, Anna Jacobson. A Monetary History of the United States, 1867-1960. Princeton University Press. June 1965.

(20) Ben Bernanke (2002). Remarks at the Conference to honor Milton Friedman, University of Chicago, Chicago, Illinois, On Milton Friedman's Ninetieth Birthday.

(21) Updated calculations based on earlier 2015 analysis by Bernanke.

(22) Sufi (2015), Andrew Crockett Memorial Lecture.

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