How Persistent Low Returns Will Shape Saving and Retirement

EDITED BY

Olivia S. Mitchell,
Robert Clark, and
Raimond Maurer

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide. Oxford is a registered trade mark of
Oxford University Press in the UK and in certain other countries

First Edition published in 2018

Impression: 1

Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

British Library Cataloguing in Publication Data
Data available

Library of Congress Control Number: 2018935371

ISBN 978–0–19–882744–3

Printed and bound by
CPI Group (UK) Ltd, Croydon, CR0 4YY

Contents

Chapter 2

Politics, Independence, and Retirees: Long-term Low Interest Rates at the US Federal Reserve

Peter Conti-Brown

President Donald Trump has frequently compared himself to one of his most important predecessors, Andrew Jackson, and has hung Jackson's portrait in the Oval Office. While Mr. Trump has not elaborated on the comparison, it is not difficult to draw the parallels. Old Hickory is perceived to be the father of populism, an irascible opponent to much of the prevailing political order of his day. Donald Trump sees himself the same way: as an outsider who challenged the existing hierarchy and won.[1]

There is a significant extra dimension to the comparison, though, that points to an important relationship in government that will far outlive the Trump presidency. Jackson was also the sworn enemy of the Second Bank of the United States, a quasi-private institution that functioned as the nation's central bank (as that term was understood at the time). As described in more detail below, different presidents can and do interact with central banking institutions in different ways. That interaction, though, tells us an enormous amount about the ways that interest-rate policies are politicized, and to what ends. This reality for the Federal Reserve (Fed) is no different in the 21st century than it was for the Bank of the United States in the 19th century.[2]

The fact that the Fed is now occupying a front-and-center role in the political arena is not a comfortable place for the central bankers who run it. Nevertheless, this role is not new. Since the global financial crisis of 2008, the Fed has rarely receded from the political maelstrom, for better or worse. This chapter charts this political terrain, focusing on a question that is as much economic as it is political: why are interest rates so low, and what does the Fed have to do with it? Whether the Fed dictates the national (and international) interest rate climate, or is merely a victim to secular economic trends in productivity is an ongoing debate, which I summarize but do not fully engage. Of more pressing interest is how the Fed is perceived politically, as combatant in that process. Low interest rates represent a profound

political problem for the Fed. Not only do they arguably violate the Fed's often forgotten third mandate to maintain 'moderate long-term interest rates,' they also scramble the political constituencies that have normally defended the central bank against attempts at political interference. As a result, when political push comes to existential shove, the Fed's monetary policy actions since 2008 risk alienating another important group: pensioners and other retirees who count on higher interest rates for their economic security and who have historically been staunch defenders of an independent central bank.

The members of the Federal Reserve System are some of the best political infighters in Washington. They have survived extraordinary assaults on its independence and structure throughout the last century. Time and time again, the Fed has not only survived, but thrived.[3] But the challenges ahead will be different, and they will require something more than the Fed has done before.

In what follows, the first section discusses the nature of equilibrium interest rates and the Fed's (in)ability to influence them. I also show that the perception that the Fed can control real interest rates is not simply public misinformation; it is also written into law. The second section traces the history of the Fed's own self-description as an independent central bank designed precisely for the purpose of dictating higher interest rates than politicians would prefer. Long-term efforts to push this narrative have now come back to haunt the Fed as it continues to maintain independence while pursuing the central goal of keeping nominal interest rates at historic lows. The third section details the consequences of the 2016 election for low interest rates.

One note on the chapter's US-based focus: though the politics and history described below focus on the Fed, major central banks in other parts of the world are facing very similar dynamics. They have been billed as economically omniscient, but their tools for addressing the most pressing economic realities that affect retirees are limited.

As with so much else about the political environment, uncertainty clouds every informed discussion of the Fed's future—and the future path of interest rates—during the Trump administration and beyond. Yet there are also dynamics at play that could push nominal interest rates down, not up. The focus for academic, policy, and industry commentators will be on these political dynamics.

The Fed's Role in Determining Low Interest Rates and the Forgotten Third Mandate

The US Congress created the Federal Reserve System in 1913 after a century of national experimentation with nearly every aspect of banking and central

banking. Today, the Fed has grown into something that its framers would not have predicted: it has become the regulator par excellence not only of the banking system, but also of the macroeconomy itself. It is, as former Fed Chair Paul Volcker once said, the 'only game in town' (Silber 2012: 201). This has led to the present moment, when the Fed has not only changed the way that banks are funded and regulated during and after financial crisis, but also how interest rates have been brought to historically low levels. Indeed, the Fed is now in an unusual position: while it has focused on fighting inflation and stabilizing employment, two of its statutory mandates, it has failed for just the second time in its modern history to deliver on its often forgotten third mandate: to maintain moderate long-term interest rates (see Figure 2.1).

Interest rates are not simply low: they are historically low. This is obviously true for short-term interest rates, which have hovered at or below the zero-lower bound in major economies since the Great Recession. But, as Figure 2.1 illustrates, this is part of a longer trend for short-term interest rates, too. This observation then prompts a new question: why?

This development is part of a longer-term trend that economist Mohamed El-Erian (2016) called the 'new normal,' coming out of the global financial crisis. Most economists (and certainly central bankers) will argue that the Fed has little to do with this phenomenon. The Fed has remarkable authority in

Figure 2.1. Ten-year Treasury constant maturity rate

Source: Board of Governors of the Federal Reserve System (2017).

controlling short-term nominal interest rates by deploying its balance sheets in a variety of different credit markets. But, as former Fed Chairman Ben Bernanke (2015: np) wrote, real interest rates—the rates most relevant for long-term investment decisions—'are determined by a wide range of economic factors, including prospects for economic growth—not by the Fed.'

The problem is that the Fed controls nominal interest rates and, usually, the nominal short-term interest rates at which banks lend to each other. By contrast, it has less control over what is often called the 'Wicksellian interest rate,' or the real interest rate consistent with full employment of labor and capital, named for Swedish economist Knut Wicksell (1936) who advanced the concept in 1898. The idea that the Fed is as much a victim of these trends as the rest of us stems from the idea that the factors determining the full deployment of labor and capital are not for the Fed to decide. Instead, these are a consequence of technological innovation, demographics, even culture, and certainly governmental fiscal policy, social policy, and the robustness of the financial system. In other words, the Fed as the monetary authority has one not-very-useful instrument, namely short-term nominal interest rates. This instrument cannot dictate the Wicksellian interest rate unilaterally; the best the Fed can do is nudge nominal interest rates toward its estimated Wicksellian rate layer. Indeed, once we focus on that real rate—that is, the interest rate minus inflation—the graph would look even worse. If this view is true, then again the question becomes: why?

One explanation comes from a Depression-era theory from Alvin Hansen (1938), one of the economists who first operationalized Keynesian macroeconomic theory. In the middle of the second of the two severe recessions of the 1930s, Hansen hypothesized that the equilibrium interest rate was so low not because of the sudden, idiosyncratic collapse of aggregate demand à la Keynesian theory, but because of something deeper. His analysis of the situation has gained influence lately, but mainly through summaries offered by others. Hansen's original perspective is worth citing in full:

> The business cycle was par excellence the problem of the nineteenth century. But the main problem of our times, and particularly in the United States, is the problem of full employment. Yet paradoxical as it may seem, the nineteenth century was little concerned with, and understood but dimly, the character of the business cycle. Indeed, so long as the problem of full employment was not pressing, it was not necessary to worry unduly about the temporary unemployment incident to the swings of the cycle. Not until the problem of full employment of our productive resources from the long-run, secular standpoint was upon us, were we compelled to give serious consideration to those factors and forces in our economy which tend to make business recoveries weak and anaemic and which tend to prolong and deepen the course of depressions. This is the essence of secular stagnation—sick recoveries which die in their infancy and depressions which feed on themselves and leave a hard and seemingly immovable core of unemployment. (Hansen 1939: 4)

From Hansen's perspective, then, all recoveries would be weak because something fundamental had changed about the economy. It wasn't a problem of depression; it was a problem of productivity and demographics.

No economist has done more to bring Hansen's perspective back to the debate about the 'new normal' than Harvard economist Lawrence Summers. From his view, Hansen's theory was right but untimely: 'Hansen turned out to be completely wrong but completely wrong in a way that suggests that at some future point he could turn out to be right' (Summers 2016: 96). Today, then, the anemic recovery from the financial crisis of 2008 and the subsequent recession is what we should expect. Low Wicksellian rates are a more-or-less permanent feature of the landscape. Productivity, from this perspective, is a thing of the past.[4]

As far as economic theory goes, the idea of an equilibrium rate over which the Fed has little control is mainstream, even for critics of the Fed's monetary policies. The idea that we are in a period of secular stagnation is not.[5] Yet these debates miss a much more important point when we consider the Fed's role in determining the interest-rate environment. The question is not 'What is the relationship between the Fed and low interest rates?' but, instead, 'How does the public perceive the relationship between the Fed and low interest rates?'

The answer to the first question is the theoretical and empirical question that occupies economists and central bankers; the second is the question of paramount political importance for those who will control the Fed's future. And that second answer takes a very different view of interest rates that is widely accepted by the public, the result of a long-standing public education program by the Fed, extending over decades, that has taken firm root in law, political discourse, and culture. That view has made it difficult to sell the Fed's own efforts to disclaim responsibility for low interest rates.

Public perception of interest rates pays little attention to the distinctions between an equilibrium rate and the nominal rate, the latter of which the Fed does in fact control. The control mechanism has an obvious economic logic, as basic as a supply-and-demand graph from introductory economics. Here, the supply and demand are supply *of* and demand *for* short-term bank loans, a kind of good for which there is a market, just as there are markets for crude oil, pineapples, or squirrel traps. The price of money in these markets is the interest rate, here the Fed's federal funds rate. When the Fed makes money less available to banks to lend to each other, they will pay more for it, and interest rates will rise. When there is more money, people will pay less for it, and interest rates drop. While the difference between the federal funds effective rate and the federal funds target rate is actually more complicated than this simple explanation suggests, the basic reality is that the Fed can and does affect interest rates through open market operations similar to the process described above: by affecting the availability of money, the Fed changes the price of money.[6]

When the availability of resources controlled by the central bank dictates the value of interest rates, the price-theory of nominal interest rates is economically accurate. Nevertheless, it is not helpful for understanding the nature of the equilibrium rate. This difference may not matter much for economic theory, but confusion between the two is a ubiquitous feature of public discourse on the Fed, interest rates, and public accountability. At a 2013 hearing, for example, Republican Senator Bob Corker lambasted Federal Reserve Chairman Ben Bernanke on exactly this theory: the Fed's continued decision to keep interest rates at the zero-lower bound had 'thrown seniors under the bus.' People living on fixed income and depending on more robust interest rates, the Senator said, were run over by the Fed's monetary policies, apparently in service of policy oriented more toward younger generations.[7] Bernanke didn't appreciate the implication, but the idea that the Fed is responsible for the level of moderate long-term interest rates cannot be blamed on any given Senator. Rather, it is written in the Federal Reserve Act itself, in the Fed's 'mandate.'

The idea of a mandate for central banks is an old one, yet in the United States it found its way into the Federal Reserve Act only in 1977. At that point, the US Congress amended the Federal Reserve Act to give the Fed its marching orders. The revised statute is worth quoting in full, largely because it has become a classic in the Mark Twain sense: it is cited often, but never read. The 'mandate' requires:

> The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates. (12 U.S.C. 225a.)

When discussing what the Fed does, the discussion is almost always reduced to a 'dual mandate' of 'price stability' and 'maximum employment.' As Janet Yellen (2017: np) put it, '[n]early 40 years ago, the Congress set two main guideposts for that task—maximum employment and price stability. We refer to these assigned goals as our dual mandate.' But the statute was broader, as it included an important third mandate: 'to promote effectively the goal of . . . moderate long-term interest rates.'

By nearly any definition, the Fed is now failing at that charge. Interest rates at the zero-lower bound are not moderate, no matter how one defines 'moderate.' Again, most economists and most central bankers would say that it has no control over this factor. But the failure is important because, whether true or not, the Fed is perceived by its congressional masters as not only having that power, but having the legal duty to use it. When the legal authority is put in these terms, the relevant question for the Fed and its long-term interest rates is not whether the Fed can unilaterally raise rates.

Instead, the question is why does the public believe the Fed has this ability at all? To address that issue, we must turn to Fed history.

The Fed's Political Independence in History

Although the Fed's mandate was provided through a political system, the institution remains jealous of its prerogatives for determining how to pursue them.[8] In the important conceptualization offered by economists Guy Debelle and Stanley Fischer (1994), the Fed has 'instrument independence,' not 'goal independence.' To prevent the Fed's goals from becoming inordinately politicized, the bank relies on this instrument independence, a loose term that is frequently invoked but rarely explained. In economics, and to a lesser extent in political science, the concept of central bank independence has been so extensively studied as to earn its own acronym: CBI.[9] Alan Blinder (2004), an academic and former central banker, called the study of central bank independence a 'growth industry,' and the growth has only accelerated in the years since.

Although there are about as many definitions of central bank independence as there are authors who describe it, we can gather from these studies a rough consensus of what central bank independence means in reference to the Fed. The consensus goes something like this. Federal Reserve independence refers to the separation, by statute, of the central bankers (specifically the Fed chair) from the politicians (specifically the US President), for purposes of maintaining low inflation. The idea is that citizens in a democracy naturally prefer a prosperous economy. Politicians seek to please the population by giving that prosperity, or at least trying to take credit for it. But when there is no prosperity to be had, politicians will resort to supporting the economy artificially by running the printing presses to provide enough money and credit for all. The short-term result is re-election for the politicians. The long-term result is worthless money that wreaks havoc on our economic, social, and political institutions.

Several widely invoked metaphors of central banking come tumbling forth: in the Homeric epic, the *Odyssey*, when Odysseus (referred to in central banking circles by his Latin name Ulysses) ventured with his men close to the seductive and vexing Sirens, he devised a scheme to allow his men to guide their ship past their seduction in safety, while he experienced the short-term joys of hearing their songs (Elster 1977). Central bank independence is our 'Ulysses contract.' We write central banking laws that lash us (and our politicians) to the mast and stuff bees-wax in the ears of our central bankers. We enjoy the ride while the technocratic central bankers guide the ship of the economy to the land of prosperity and low inflation. (The public, by the way, represents the Sirens in this metaphor.)

The other commonly invoked metaphor is even more colorful. In the oft-repeated words of William McChesney Martin (1955), the longest serving Fed chair in history, the Fed is 'in the position of the chaperone who has ordered the punch bowl removed just when the party was really warming up.' The subjects of the metaphors differ across the millennia, but the idea is the same: the partygoers and Ulysses alike want something in the near term that their best selves know is bad for them in the long term. Central bank independence is the solution.

It is the last feature of the Ulysses/chaperone conception of independence that matters for our understanding of the Fed's 'new normal' of long-term low interest rates: the idea that the Fed can use technocratic expertise to accomplish its goal of price stability. This notion of Fed independence, and the reasons for it, are so entrenched in the academic and public imagination that deviations from this view present complications even in the Fed's own self-image, to say nothing of how the Fed is perceived externally. And now, when the Fed appears to be pursuing a policy of keeping interest rates *low* rather than raising them *high*, then the Ulysses/chaperone model starts to fail.

To understand this dynamic, and where it came from, we need to know more about why the Fed was created and how it changed over time. A conventional retelling of the Fed's history is that it was a response to the problem of JP Morgan's mortality. There was a financial panic in 1907, as there had been so many times throughout the 19th century, and, as he had before, Morgan—the famous head of a banking dynasty—had stepped in to save the day. Afterward, the public and members of Congress decided to do what they had failed to do before: create a central bank that would endure.[10]

The real story of the Fed's founding is much more complex than this. The time between the Panic of 1907 and the Federal Reserve Act of 1913 made a big difference to the shape the Fed ultimately took, including the strange relationship between the Federal Reserve Board and the 12 quasi-autonomous Federal Reserve Banks. But most important for understanding the current context of low interest rates was the political constituencies for having a central bank at all. Farmers and others likely to be chronically indebted were hostile to the idea of banker control over currency and its value; bankers, on the other hand, were not.

Our understanding of the structure of interest rates and central bank influence over interest rates was different, in large part because the world was different. When the Federal Reserve Act was first passed, the United States was on the gold standard and sought to gain access to international markets also on the gold standard (Broz 1997). As the Fed transitioned to playing a greater role in setting national and international macroeconomic conditions, the perception of its role changed, too.

Perhaps the greatest influence on the public perception of the Fed was William McChesney Martin, Jr., Fed Chairman from 1951 to 1970, and author of the 'chaperone' conception of the central bank role. Martin came to the Fed with a long familiarity with its operations, as his father was the Governor of the Federal Reserve Bank of St. Louis. The son had also worked as president of the New York Stock Exchange in the late 1930s, and then as president again of the Export–Import Bank. By 1951, he was the Assistant Secretary of the Treasury for monetary affairs in the Truman administration.[11]

It was an interesting time to be at the Treasury. The United States had recently discovered that the Soviets had successfully tested an atomic weapon, three years sooner than American estimates. Conflict on the Korean peninsula threatened to plunge the world once again into global war. Most importantly for understanding the Fed's political constraints, it was in intense conflict with the US Treasury. The Fed had been subsidizing US government securities since the beginning of World War II and was agitating to stop. The Treasury wanted the subsidy to continue and refused to budge.

Eventually, the conflict came to a head, but not until President Truman had summoned the Federal Open Market Committee to the Oval Office to berate it for the first and last time in history. With Martin as the Treasury's lead negotiator, the Fed and Treasury reached what came to be called the Fed–Treasury Accord of 1951. The Accord was a public announcement that the Federal Reserve and Treasury had agreed that the Treasury would no longer dictate to the Fed the interest rates that Treasury would expect the Fed to support in the public markets. For many, this is considered a 'major achievement' in American history (Meltzer 2003: 711). In fact, the Accord did not do much on its own: it was just a single-sentence announcement. Here it is in full:

> The Treasury and the Federal Reserve System have reached full accord with respect to debt management and monetary policies to be pursued in furthering their common purpose to assure the successful financing of the Government's requirements and, at the same time, to minimize monetization of the public debt. (Board of Governors 1952).

All this statement says is that the Fed and Treasury agreed on the twin aims of 'successful financing of the Government's requirements' and the minimization of the 'monetization of the public debt.'

Probably as part of the Accord itself, Fed Chairman Thomas McCabe stepped down and Martin replaced him. But soon, Martin took a very different approach to his role and sought not only to balance those two goals: he also declared the Fed independent of the Treasury for purposes of determining monetary policy completely. President Truman, once Martin's

patron, now looked at him very differently. On Martin's report, at their next meeting at an event at a New York City hotel, Truman had but one word to say to the affable Martin: 'Traitor!' (Bremner 2004: 91).

Given that so little was determined by the Accord itself, Martin had to use his own leadership to fill in the gaps. Martin accomplished this in various ways, but one of the most important was not via market intervention or political fighting, but by language. It is difficult to overstate Martin's love for metaphors: his public speeches are full of them. The chaperone language was not his only enduring image. He also stated that, 'lean against the winds of deflation or inflation, whichever way they are blowing.' He also argued that the economy was like a river: the Fed's aspiration was for money and credit to 'flow . . . like a stream. This stream or river is flowing through the fields of business and commerce. We don't want the water to overflow the banks of the stream, flooding and drowning what is in the fields. Neither do we want the stream to dry up, and leave the fields parched.'[12]

In practice, Martin was able to use this kind of language to thwart efforts to trim the Fed's sails or be bullied by politicians. After he had accepted one of Lyndon Johnson's infamous invitations to tour the President's Texas ranch at blistering speeds with Johnson driving recklessly, Martin took the opportunity to point out a large boulder interfering with the flow of the river on the property. Martin explained to Johnson that raising the discount rate was like removing that boulder: it would let credit, like water, run more smoothly. When Martin recounted the exchange to Fed staffers, they quickly corrected the Fed Chairman: that's not how discount rates work. Martin responded: 'Well, it did this time.'[13]

Another metaphor was the idea that the Fed could take away the punch bowl, and also decide who should be drinking and when. Central bankers' insistence on their ability to execute this strategy meant, in time, that there was a trust that the Fed would be able to resolve the time inconsistency problem very easily, and always in the direction of the uncomfortably higher interest rates. This conception stands in painful contrast to Bernanke's insistence on Wicksellian interest rates and the central bank's inability to dictate interest rates to the economy. Later historical developments in Fed history only added to the perception of omnipotence, including the fall of Arthur Burns and the rise of the Great Inflation, Paul Volcker and the skyrocketing interest rates that finally broke inflation's back, and Alan Greenspan as the 'maestro' economic tinkerer without peer.

The financial crisis of 2008 was another historical watershed for the Federal Reserve, for many reasons. First, the crisis brought the Fed front and center to the public's attention in largely unfavorable ways. Second, the idea that the Fed bailed out Wall Street through the extraordinary deployment of billions of dollars took root in the public's mind, and not favorably. In other words, the Fed's unconventional monetary policy actions in the

aftermath of the crisis occurred when everyone was watching, which prompted a populist backlash not anticipated by Martin's conception of Fed independence. Instead of insisting that the Fed leave the punch bowl on the table, the populist protestors were *opposed* to low interest rates. The debtors who would benefit most from artificially low interest rates were either silent during the political debate, or they misunderstood the ramifications of the Fed's policies. So it was that Texas Governor and presidential contender Rick Perry in 2011 lambasted the Fed with violent imagery: 'Printing more money to play politics at this particular time in American history is almost . . . treasonous,' he said. 'I don't know what y'all would do to him in Iowa, but we would treat him pretty ugly down in Texas' (Zeleny and Calmes 2011: np).

The simultaneous depiction of the Fed as controlling interest rates and using them to abuse those who would require a higher return on their investments is, then, a deeply rooted one. My point is that the Fed itself was the author of this public idea and drove it deeply into the public psyche in the service of preserving its independence. Now that it requires public support for the *opposite* reasons, that support will be difficult to come by. The political alliances that have previously supported the Fed were built on a notion that does not apply when the equilibrium rate is low.

The Fed During the Trump Administration

Prior to the US presidential election of 2016, the prevailing view was that Donald Trump was too toxic to too many political constituencies to win the general election. In central banking circles, the debate about the equilibrium rate was focused on the question of secular stagnation, not on the inflationary pressures that fiscal policy can create.

What a difference a presidential election made! The election of 2016 was a defining moment for the Fed, with potent consequences for both real and nominal interest rates. For real interest rates, if the Trump administration adopts policies that change the underlying nature of the investment climate and the productive deployment of labor and capital, then the equilibrium rate could rise again. The equity markets, at least initially, treated the election as indicative of accelerated growth, with only modest increases in inflation expectations.

How nominal interest rates develop will be a more interesting dilemma. The Fed has accelerated its campaign to tighten interest rates, a process that began in December 2015. If the Fed's expectations are to be heeded—and to be clear, these projections have been chronically off-target—then we should expect to see a federal funds rate in the 3 percent range by 2019.[14] Yet many factors are at play. Not least is how the Fed will be reshaped during

the Trump administration, since he has the opportunity to fill several vacancies on the board. Every president has the statutory and constitutional right to make these appointments and uses them to influence his agenda. Trump will be no different.[15]

Predicting President Trump's agenda is no easy matter, and the point of this chapter is not to stay rooted in the present but to articulate broader applications of political dynamics that will extend into the future. Even so, it is useful to think through how the Trump administration's approach to interest rate policies will influence Fed decision-making. In the past, presidents from both parties generally favored central bankers who lowered interest rates for reasons the Ulysses/chaperone conception of Fed independence anticipated: it is helpful to win elections and preserve legacies when the economy is booming, even if that boom is only on the back of cheap currency. Yet during the Obama administration, Republicans consistently criticized the Fed for these very low interest rates. It is unclear whether the Trump coalition will pursue a more hawkish monetary policy consistent with those 2009–2016 critiques, or favor presidential prerogatives, as has been historically true.

Appointments, though, are not the only mechanism that presidents have for influencing the Fed. The other mechanism, used throughout history, is to deploy the many non-legal mechanisms at a president's disposal to influence central bankers. President Trump's decision to appoint Jerome Powell to succeed Janet Yellen as Fed Chair may have reassured some that the Fed will continue to have its independence in determining monetary policy. But President Trump, like so many of his predecessors, may also develop strong ideas about the appropriate direction that interest rates will take. If the Fed engages in tightening interest rates to cool the economy, he may seek to impose political constraints on the Fed preventing it from moving too quickly. In that case, the Fed's nominal interest rates may undershoot the equilibrium rate—and in the process, cause an overheating economy to trigger inflation. If that occurs, it will in fact be the Fed—not the economy—that is keeping interest rates artificially low.

Conclusions

This chapter has argued that the Fed's status as 'chaperone' given independence by Congress for the purpose of constraining inflationary fiscal policy has backfired during times when the Fed has pursued the opposite tack. A Fed trying to keep the party from getting out of control as an omnipotent central banker is an image that has taken hold in the public imagination in a way that few if any governmental agencies can match. That

is an altogether different image from a Fed trying to get a bunch of wallflowers to take tequila shots.

It is little wonder, given the decades-long effort to construct an inflation-fighting central bank, that this abrupt change has caused so much backlash. And it is not enough to claim that the public's misunderstanding on these issues reflects a burden that the public itself must correct. The law requires the Fed to pursue moderate long-term interest rates, in an almost always-forgotten third mandate. In any event, the reason the public believes the Fed is an inflation fighter is that the Fed and central bankers who work within it have been pushing this argument for decades.

Historically, this defense of the currency against inflation has put retirees as staunch defenders of an independent central bank. A world of low interest rates credited to the Fed removes this support. Few groups feel the effects of these rates more profoundly than those who depend on more robust interest rates for their economic security. As Wallick et al. in Chapter 4 of this volume have highlighted, the investment environment for low interest rates requires dramatic changes.

The Fed has become a victim of its own success. The Fed's ability to affect the equilibrium rate that reflects the fullest deployment of labor and capital is not absolute, nor even very strong at all. Moreover, its control over nominal interest rates is important but often exaggerated. Presidential administrations play a decisive role in determining how nominal and real interest rates interact, as well as how activist Fed policy and underlying economic realities intersect. Should a president make appointments or otherwise influence central banking policy to be more consistently accommodative than the equilibrium rate suggests, then inflation will be the consequence and the secular trend of low interest rates will become artificial, precisely as the Fed's critics have argued has been true for years. As we look to the future of monetary policy, the question about central banking control and chronic low interest rates will be as much political as it is economic.

Notes

1. For comparisons between Jackson and Trump, see Baker (2017).
2. For more on Jackson and the Second Bank of the United States, see Howe (2007).
3. For more on the Fed's political role, see Kaiser (2013). For the Fed's ability to gain authority after crisis, see Shull (2005).
4. For the deep historical perspective, see Gordon (2016).
5. For the strongest counterpoint to secular stagnation, see Hamilton et al. (2015).
6. This paragraph borrows from arguments made in Conti-Brown (2016: 134).
7. See Davidson (2013) for coverage of the hearing.

8. Drawn from Conti-Brown (2016: 2).
9. For a recent review of this extensive literature, see Fernández-Albertos (2015).
10. For more on this origin story, see Lowenstein (2015) and Bruner and Carr (2009).
11. Bremner (2004) is a superb biography of Martin.
12. Cited by Conti-Brown (2016: 47) from an interview in US News and World Report, February 11, 1955.
13. As recounted in Bremner (2004: 211).
14. For the Fed's projections, see https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20161214.htm.
15. Chang (2003) provides an excellent overview of the dynamic between President, Congress, and the Fed at the appointment level.

References

Baker, P. (2017). 'Jackson and Trump: How Two Populists Compare.' *New York Times,* March 15.

Bernanke, B. S. (2015). 'Why Are Interest Rates So Low?' *Brookings Institution Blog,* March 30.

Blinder, A. (2004). *The Quiet Revolution: Central Banking Goes Modern.* New Haven, CT: Yale University Press.

Board of Governors of the Federal Reserve System (1952). *Thirty-Eighth Annual Report of the Board of Governors of the Federal Reserve System Covering Operations for the Year 1951.* Washington, DC.

Board of Governors of the Federal Reserve System (2017). '10-Year Treasury Constant Maturity Rate.' Washington, DC. https://fred.stlouisfed.org/series/DGS10.

Bremner, R. P. (2004). *Chairman of the Fed: William McChesney Martin Jr. and the Creation of the Modern American Financial System.* New Haven, CT: Yale University Press.

Broz, J. L. (1997). *The International Origins of the Federal Reserve System.* Ithaca, NY: Cornell University Press.

Bruner, R. F., and S. D. Carr (2009). *The Panic of 1907: Lessons Learned from the Market's Perfect Storm.* Hoboken, NJ: Wiley.

Chang, K. (2003). *Appointing Central Bankers: The Politics of Monetary Policy in the United States and the European Monetary Union.* Cambridge: Cambridge University Press.

Conti-Brown, P. (2016). *The Power and Independence of the Federal Reserve.* Princeton, NJ: Princeton University Press.

Davidson, P. (2013). 'Bernanke: Economy Still Needs Fed Stimulus.' *USA Today,* February 26.

Debelle, G., and S. Fischer (1994). 'How Independent Should a Central Bank Be?' Conference on Monetary Policy in a Low Inflation Regime, Federal Reserve Bank of Boston.

El-Erian, M. (2016). *The Only Game in Town: Central Banks, Instability, and Avoiding the Next Collapse.* New York: Random House.

Elster, J. (1977). 'Ulysses and the Sirens: A Theory of Imperfect Rationality.' *Social Science Information* 16(5): 469–526.

Fernández-Albertos, J. (2015). 'The Politics of Central Bank Independence.' *Annual Review of Political Science* 18(1): 217–37.

Gordon, Robert J. (2016). *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War*. Princeton, NJ: Princeton University Press.

Hamilton, J. D., E. S. Harris, J. Hatzius, and K. D. West (2015). 'The Equilibrium Real Funds Rate: Past, Present, and Future.' University of California San Diego Working Paper. San Diego, CA: University of California San Diego.

Hansen, A. (1938). *Full Recovery or Stagnation?* New York: W.W. Norton.

Hansen, A. (1939). 'Economic Progress and Declining Population Growth.' *The American Economic Review* 29(1): 1–15.

Howe, D. W. (2007). *What Hath God Wrought: The Transformation of America, 1815–1848*. New York: Oxford University Press.

Kaiser, R. (2013). *Act of Congress: How America's Essential Institution Works, and How It Doesn't*. New York: Knopf.

Lowenstein, R. (2015). *America's Bank: The Epic Struggle to Create the Federal Reserve*. New York: Penguin Press.

Martin, W. M. (1955). 'Address before the New York Group of the Investment Bankers Association of America,' October 19. https://fraser.stlouisfed.org/files/docs/historical/martin/martin55_1019.pdf.

Meltzer, A. H. (2003). *A History of the Federal Reserve. Vol. 1, 1913–1951*. Chicago, IL: University of Chicago Press.

Shull, B. (2005). *America's Fourth Branch: The Federal Reserve's Unlikely Rise to Power and Influence*. New York: Praeger.

Silber, W. L. (2012). *Volcker: The Triumph of Persistence*. New York: Bloomsbury Press.

Summers, L. (2016). 'Secular Stagnation and Monetary Policy.' *Federal Reserve Bank of St. Louis Review* 98(2): 93–110.

Wallick, D. W., D. B. Berkowitz, A. S. Clarke, K. J. DiCiurcio, and K. A. Stockton (2018). "Getting More from Less in Defined Benefit Plans: Three Levers for a Low-Return World," in R. Clark, R. Maurer, and O. S. Mitchell (eds.), *How Persistent Low Returns Will Shape Saving and Retirement*. Oxford, UK: Oxford University Press, pp. 44–60.

Wicksell, K. (1936, first published 1898). *Interest and Prices: A Study of the Causes Regulating the Value of Money*. New York: Sentry Press.

Yellen, J. (2017). 'The Goals of Monetary Policy and How We Pursue Them.' Address before the Commonwealth Club, San Francisco, CA, January 18.

Zeleny, J., and J. Calmes. (2011). 'Perry Links Federal Reserve Policies and Treason.' *New York Times*, August 16.

Chapter 3

Low Returns and Optimal Retirement Savings

David Blanchett, Michael Finke, and Wade Pfau

This chapter explores how lower expected returns affect optimal saving and spending during working years, retirement replacement rates, retirement lifestyles, and the cost of bequests. This is important because the prices of bonds and stocks are much higher than in the recent past, suggesting a greater likelihood that portfolio returns will fall below the assumptions commonly used to estimate retirement savings adequacy. Basing retirement planning recommendations on historical returns can provide a misleading picture about what individuals at present will need to do to smooth their lifestyles and fund successful retirements.

We estimate a simple life cycle model to illustrate how lower future asset returns will impact workers. Optimal lifetime spending is sensitive to expected rates of return. Workers will need to save significantly more to smooth spending and they will need to spend less before and after retirement. In a model that incorporates social security, taxes, expected longevity by earned lifetime income, and spending patterns in retirement we find that lower-income workers will need to save about 50 percent more if future asset returns resemble today's low yield environment, and higher-income workers will need to save as much as 100 percent more to retire at age 65. A reasonable alternative to facing a lower level of lifetime spending is delaying retirement.

Investments have Become More Expensive

Lower investment returns must be factored into how workers plan for retirement. Figure 3.1 compares the cost of buying $1,000 of income from a 10-year Treasury Bond, $1,000 of stock dividends, and $1,000 of total corporate earnings, during 20-year time periods beginning in 1955. The figure suggests that it is now more expensive to buy income from investments than in the past, and high asset prices have persisted for a long time. There were a few periods during the 20th century when bond yields fell to a rate similar to the near-zero yields of today, but these were generally caused

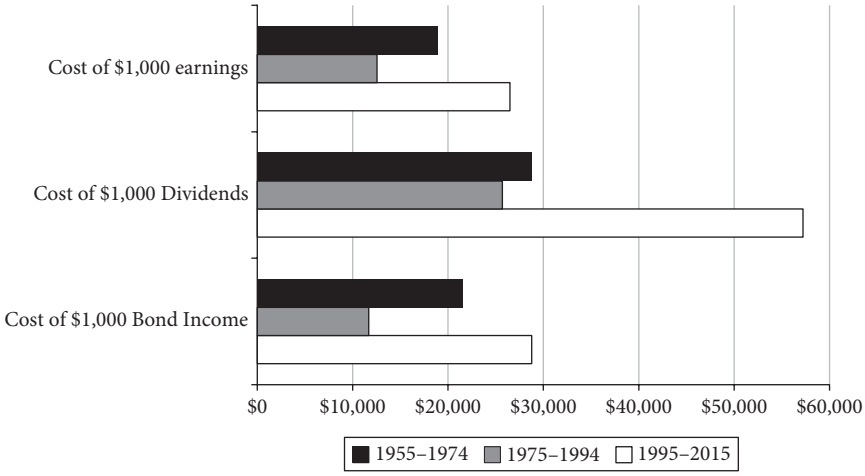

Figure 3.1. Average cost of purchasing $1,000 in ten-year Treasury income, dividends, and corporate earnings

Source: Federal Reserve of St. Louis (2017).

by a flight to safety during each of the World Wars and the Great Depression. The current era is unique in that low bond yields and high stock valuations are occurring in tandem for an extended period. This suggests an increase in demand for all financial assets.

Life Cycle Implications

A reasonable goal for most households is to save and spend in a manner that roughly smooths spending (as a proxy for one's standard of living) over a lifetime, giving rise to retirement saving. Forward-looking workers will understand that their lifestyles cannot be maintained by social security alone, so they will set money aside during their working years to avoid spending reductions in retirement.

Among other factors, decisions about optimal lifetime saving and spending depend on future salary, retirement length, and the investment rate of return. Given a salary profile and length of life, higher investment returns will allow a household to save less while accumulating the same wealth at retirement. For example, if a household earns $50,000 at age 25, expects 3 percent annual salary growth, and seeks $1 million at age 65, this can be achieved with a 10 percent annual savings rate when investments return 5 percent. But if returns are only 2 percent, the required savings rate increases to 18 percent to reach this goal.

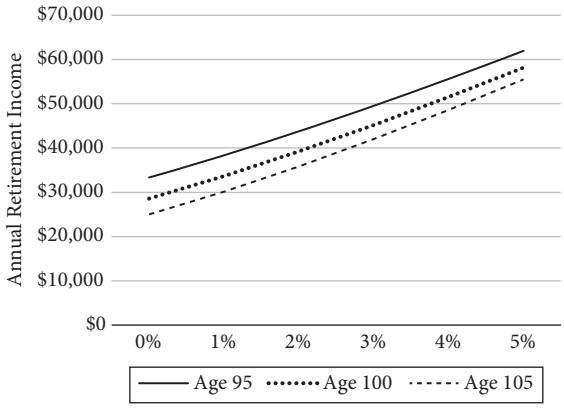

Figure 3.2. Cost of funding retirement income to various ages with a $1 million bond ladder

Source: Authors' calculations.

Lower returns will also reduce the income generated from $1 million from age 65. Figure 3.2 shows the amount of income a retiree can purchase using a bond ladder at real interest rates from 0 to 5 percent for a duration of 30 years (until age 95), 35 years (to age 100), and 40 years (to age 105). Sustainable income falls from $61,954 to only $38,364 as rates fall from 5 percent to 1 percent. Extending the ladder to age 100 or 105 not only reduces the income that can be withdrawn each year at 5 percent ($58,164 and $55,503), but also increases the income spread compared to a 1 percent expected return ($33,667 and $30,154). Longer retirements are particularly hard hit by lower asset returns.

Figure 3.3 shows how optimal spending levels are reduced with lower rates of return, and the varying impact of asset returns on the cost of funding a legacy goal. Because workers need fewer dollars today to fund a dollar of spending in the future, higher rates of return allow a saver to spend more before and after retirement. Although the difference between a 6 percent and a 4 percent real rate of return appears modest, this two-percentage-point drop in returns results in a 9.1 percent decrease in lifetime spending (from $46,938 to $42,653) with no bequest and an 11.6 percent decrease in lifetime spending (from $46,008 to $40,572) with a $500,000 bequest. If real lifetime rates fell to 2 percent, lifetime spending would drop by 22.2 percent ($36,538) compared to a 6 percent real rate of return and by 34 percent ($32,195) with a $500,000 bequest. Low lifetime real rates of return will have a significantly larger impact on the spending of households that hope to leave a bequest.

Income replacement rates at retirement also fall with lower expected returns if the retiree seeks to smooth his lifetime standard of living (see

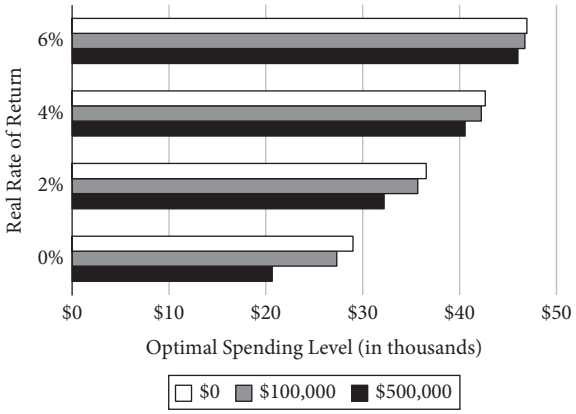

Figure 3.3. Optimal spending by expected real portfolio return and legacy goal

Note: Calculations assume a 30-year career followed by a 30-year retirement, a starting salary of $50,000, and real salary growth of 1 percent. Rates of return are defined in real terms, and retirement spending adjusts for inflation. The legacy goal reflects the value of investment assets targeted to remain at the end of retirement.

Source: Authors' calculations.

Figure 3.4). Planners therefore should consider the need to adjust replacement rates downward if they anticipate a low return environment during the retirement planning process. While optimal replacement rates at a 6 percent real portfolio return are near the 70 percent replacement rate rule of thumb, a 2 percent real portfolio return will result in an optimal replacement rate of about 55 percent when there is no bequest motive. At a 0 percent real portfolio return, the optimal replacement rate is a bit above 40 percent. With a legacy goal of $500,000, the optimal replacement rate falls further to 31 percent.

Finally, a perhaps counterintuitive result of our life cycle simulations in a low-return environment is that households will need to accumulate more wealth by the time they retire in order to maintain even a lower standard of living in retirement—particularly if they hope to leave a legacy. At a 2 percent expected real rate of portfolio return, the household must save just over $1 million by retirement with a $500,000 legacy goal, while a household expecting a 6 percent real rate of return will need to save just over $750,000. The amount of savings required in a low return environment as shown in Figure 3.5 (the difference between income and spending) needs to be much higher to fund a larger nest egg in order to pay for a more expensive retirement. As noted, the amount that the household can spend each year in this more expensive retirement is also more modest.

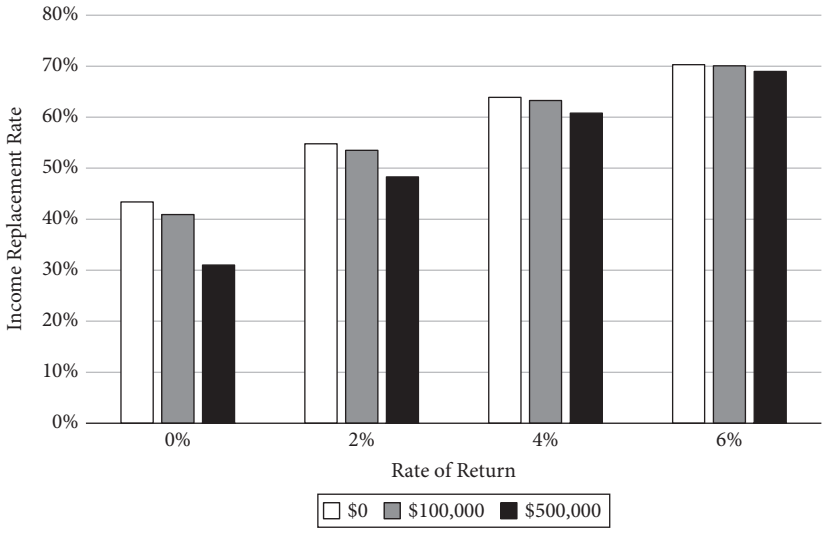

Figure 3.4. Income replacement rates and legacy goal

Note: Calculations assume a 30-year career followed by a 30-year retirement, a starting salary of $50,000, and real salary growth of 1 percent. Rates of return are defined in real terms, and retirement spending adjusts for inflation. The legacy goal reflects the value of investment assets targeted to remain at the end of retirement.

Source: Authors' calculations.

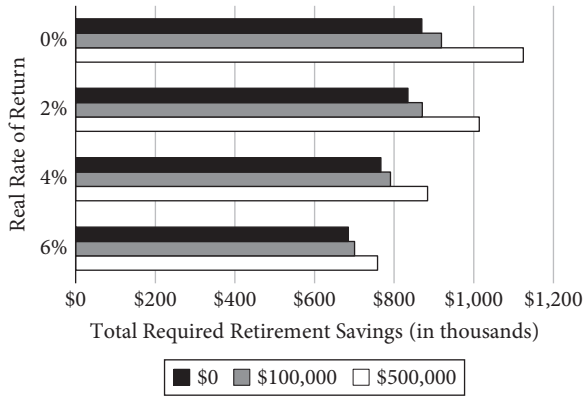

Figure 3.5. Total savings required to fund lifetime spending goal at retirement by legacy goal

Note: Calculations assume a 30-year career followed by a 30-year retirement, a starting salary of $50,000, and real salary growth of 1 percent. Rates of return are defined in real terms, and retirement spending adjusts for inflation. The legacy goal reflects the value of investment assets targeted to remain at the end of retirement.

Source: Authors' calculations.

What is a reasonable portfolio return assumption? From the investor's perspective, the choice should be net of inflation, investment expenses, asset management fees, and taxes. Real interest rates can be found using the yield curve for Treasury Inflation-protected Securities (TIPS). With a 1 percent rate and longer-term maturities, investment and asset management fees may result in negative real returns. Expected real equity returns may be in the range of perhaps 2–4 percent net of asset fees and inflation. It is reasonable to evaluate the planning consequences of a future 0 percent to 2 percent real future portfolio return.

Changes in Longevity

While the length of the retirement life cycle stage is unknown at the time of retirement, the cost of funding an income stream rises as expected longevity rises. A longer lifetime gives workers three choices. They can retire later; they can retire at the same age as yesterday's retiree and spend less; or they can retire at the same age and accept a greater risk of outliving assets while maintaining the same lifestyle. None of these choices results in a better retirement than the high return environment would.

Life expectancies for Americans who reach the age of 65 rose significantly during the twentieth century. In addition, higher-income earners are living longer than lower earners, as indicated in Figure 3.6. This relatively recent trend (Chetty et al. 2016) in which higher-earning Americans are seeing the largest improvements in longevity raises the cost of retirement for those who

Figure 3.6. Differences in life expectancies by household income for a 65-year-old man and woman

Source: Human Longevity Project (2017).

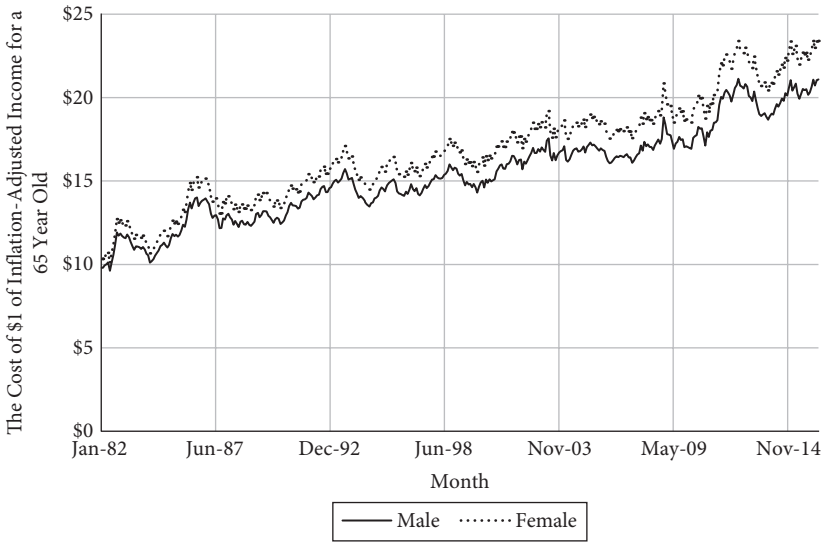

Figure 3.7. The cost of buying $1 in real annuity income at age 65 over time

Source: Blanchett et al. (2017).

rely the most on savings to maintain their spending in retirement. Since social security provides a larger income replacement rate for lower-income workers, increases in longevity raise the cost of retirement for those who need to replace the largest portion of their retirement income with savings.

The simultaneous improvement in longevity coupled with the decline in real interest rates on bonds raise the cost of buying an annuitized income stream in retirement. Figure 3.7 reports the cost of buying $1 in lifetime income via an inflation-adjusted annuity using mortality-weighted net present value of cash flows. Using historical mortality tables from the Social Security Administration (2015), historical bond Treasury yields from the Federal Reserve Bank of St. Louis (2017), and historical implied inflation estimates from the Federal Reserve Bank of Cleveland (2017), we calculate the cost of buying safe real income between 1982 and 2015. Observed annuity payouts offered by annuity companies differ slightly, but they are very similar to the prices of annuities using data from Immediateannuities.com (2017).

Our results show that rising longevity and falling real interest rates have doubled the cost of buying safe income over the last 35 years. In other words, a retiree today who hopes to fund expenses through safe investments will need to save twice as much, all else equal, if he or she expects to retire at age 65.

It may be tempting for retirees to avoid annuitizing wealth at retirement when the cost of buying safe income is so high. In reality, annuitizing safe

investments becomes even more important when interest rates are low. This is because building a bond ladder, an alternative to annuitization, is also more expensive when interest rates are low. But the difference between the cost of buying a bond ladder to fund spending, particularly spending in old age, and buying income through an annuity widens as interest rates fall. In other words, the mortality credit that allows a retiree to spend a higher percentage of his or her income than he or she could receive from a bond ladder becomes relatively more important when interest rates are low.

Estimated Increases in Optimal Savings Rates

Many assumptions in this life cycle model are unrealistic. We have not included Social Security income, which provides an income cushion that softens the blow of low asset returns. We also omit differences in taxation before and after retirement, and we do not consider the natural decrease in spending that most retirees experience as their physical and cognitive abilities decline in old age.

To address these complexities, we have built a model to estimate the required savings rate needed to fund a spending amount after tax that smooths consumption immediately after retirement and then maintains a typical retiree's subsequent declining spending path (Blanchett and Idzorek 2015). It also incorporates the impact of progressive taxation at different levels of income before and after retirement, and it estimates the amount of Social Security income that a retiree at different levels of income can expect to receive. We assume that all savings are pre-tax (e.g., in a Traditional 401(k) or IRA). A more detailed description of assumptions is provided in the Appendix.

In line with the observed decline in real spending that occurs during retirement (Blanchett 2014), we assume that real spending needs fall each year in retirement. Earnings paths are based on empirically observed changes in pay by age and level of income. We also assume that the amount of annual savings rises with income over the life cycle. Since longevity is expected to improve for future workers, we assume younger workers will have to fund more years of spending in retirement if they retire at a given age. Since higher-income workers will also live longer, we assume that higher earners will need to fund more years of retirement spending.

American retirees rarely annuitize their savings to provide guaranteed income throughout retirement, and hence, a certain percentage of retirees will outlive their savings. This requires us to establish an acceptable probability of depleting savings during retirement in order to generate a lifetime spending path. Our simulations set this probability at 20 percent. A lower probability would result in higher estimated savings rates. Mortality rates

for single households are based on gender-neutral mortality, while mortality rates for a married household assume one male and one female of the same age.

Asset returns are estimated using an autoregressive model (Blanchett et al. 2013), calibrated so that one return series approximates the historical averages; it includes three additional scenarios of low, medium, and high expected returns. The high scenario has returns similar to long-term averages but incorporates today's low bond yields. We also include a 50 bp portfolio fee, so workers will need to save more than our estimates in order to pay higher fees on savings.

Worker's portfolios are assumed to decrease the fraction of risky assets nearing retirement. The allocation is based on the Morningstar Moderate Lifetime Index glide path, which takes into account the present value of human capital as a bond-like asset to generate optimal asset allocations over the life cycle (Morningstar 2015).

We estimate savings rates for scenarios that include low, moderate, and historical asset returns. In the low and moderate simulations, bond yields begin at a 2 percent real rate of return. In the low return scenario, the mean real return starts at 2 percent and follows a random distribution that rises to 3.5 percent at the 75th percentile and 5.25 percent at the 95th percentile (or falls to 1 percent at the 5th percentile). In the moderate return scenario, the real return rises to 4 percent on average. Since rates of return on long-duration corporate securities are currently below the mean expectations in the low return scenario, our projected saving rates using these rates of returns may underestimate the saving needed if the low return environment persists.

Results

Table 3.1 provides results for workers at various age and income levels who intend to retire at age 65. Optimal saving rates using historical data for joint households who start saving at age 25 are between 4.3 percent for low earners ($25,000), up to 9 percent for high earners ($250,000), and between 6.8 percent and 8.8 percent for singles. Higher-income households must save more because Social Security replaces a smaller percentage of income and because of progressive taxation.

We assume moderate returns increase the optimal saving rate by 63 percent, to 7.0 percent for couples with $25,000 of household income, and by 82 percent, to a 16.4 percent savings rate for couples earning $250,000. For most higher-income workers, a persistent low return environment results in workers optimally contributing up to the limit of their employer-sponsored retirement contributions even if they begin saving at a

TABLE 3.1 Target total pre-tax savings rates for various households just starting to save for retirement

		25 Years Old						
		Single Household				Joint Household		
		Returns				Returns		
		Historical	Low	Mid		Historical	Low	Mid
Household Income ($0,000s)	$25	6.8	11.3	9.0	$25	4.3	7.0	5.7
	$50	8.1	14.2	11.2	$50	6.4	10.9	8.6
	$100	8.2	14.9	11.4	$100	6.9	12.5	9.7
	$150	8.8	15.9	12.1	$150	8.0	14.2	11.2
	$200	9.0	16.4	12.7	$200	8.7	15.6	12.0
	$250	9.3	16.8	13.0	$250	9.0	16.4	12.7
		30 Years Old						
		Single Household				Joint Household		
		Returns				Returns		
		Historical	Low	Mid		Historical	Low	Mid
Household Income ($0,000s)	$25	7.4	12.2	9.9	$25	4.2	6.6	5.5
	$50	9.9	17.0	13.5	$50	7.2	12.1	9.6
	$100	10.1	17.6	14.0	$100	8.5	14.3	11.5
	$150	11.0	18.7	14.6	$150	9.6	16.9	13.2
	$200	11.4	19.2	15.4	$200	10.6	18.1	14.2
	$250	11.7	19.5	15.7	$250	11.3	18.8	15.0
		35 Years Old						
		Single Household				Joint Household		
		Returns				Returns		
		Historical	Low	Mid		Historical	Low	Mid
Household Income ($0,000s)	$25	8.9	13.6	11.3	$25	4.2	6.3	5.0
	$50	12.1	18.1	15.8	$50	8.6	13.1	11.1
	$100	12.5	20.4	17.1	$100	10.0	16.8	13.4
	$150	13.2	22.2	17.8	$150	11.8	19.0	15.4
	$200	13.9	23.7	18.4	$200	12.8	21.1	17.4
	$250	14.3	24.1	18.8	$250	13.7	23.5	18.3
		40 Years Old						
		Single Household				Joint Household		
		Returns				Returns		
		Historical	Low	Mid		Historical	Low	Mid
Household Income ($0,000s)	$25	10.4	14.8	12.8	$25	4.3	6.3	4.9
	$50	13.9	19.4	17.5	$50	9.4	12.4	11.2
	$100	16.5	25.6	20.4	$100	12.6	19.0	16.5
	$150	17.6	26.4	22.8	$150	14.5	23.8	18.6
	$200	18.1	27.3	24.3	$200	16.4	25.5	20.1
	$250	18.5	27.5	24.8	$250	17.6	26.4	22.8

Source: Blanchett et al. (2017).

TABLE 3.2 Impact of retirement ages on target total pre-tax savings rates for a 35-year-old (%)

		Retire at Age 60						
		Single Household				Joint Household		
		Returns				Returns		
		Low	Mid	Historical		Low	Mid	Historical
Household Income ($0,000s)	$25	21.7	17.8	14.1	$25	18.3	14.9	12.0
	$50	24.6	19.1	16.9	$50	21.4	18.2	15.0
	$100	25.9	20.7	16.3	$100	24.8	19.2	15.0
	$150	25.8	20.1	16.2	$150	25.6	19.6	15.5
	$200	25.9	20.5	16.3	$200	25.9	19.9	16.1
	$250	25.9	20.7	16.4	$250	26.0	20.5	16.4
		Retire at Age 65						
		Single Household				Joint Household		
		Returns				Returns		
		Low	Mid	Historical		Low	Mid	Historical
Household Income ($0,000s)	$25	13.6	11.3	9.1	$25	6.3	5.0	4.3
	$50	18.1	15.8	12.3	$50	13.1	11.1	8.9
	$100	20.4	17.1	13.2	$100	16.8	13.4	10.7
	$150	22.2	17.8	13.8	$150	19.0	15.4	12.1
	$200	23.7	18.4	14.3	$200	21.1	17.4	13.4
	$250	24.1	18.8	14.8	$250	23.5	18.3	14.2
		Retire at Age 60						
		Single Household				Joint Household		
		Returns				Returns		
		Low	Mid	Historical		Low	Mid	Historical
Household Income ($0,000s)	$25	6.2	4.8	4.2	$25	0.0	0.0	0.0
	$50	12.7	10.6	8.7	$50	3.8	2.8	2.0
	$100	15.9	12.8	10.3	$100	9.1	7.4	6.3
	$150	18.3	14.7	11.7	$150	13.8	11.3	9.1
	$200	19.8	16.6	12.8	$200	17.2	13.8	11.1
	$250	21.4	17.6	13.6	$250	18.7	15.4	12.2

Source: Blanchett et al. (2017).

young age. Workers relying on historical returns to estimate optimal savings would believe that they needed to save much less than is needed to preserve their lifestyle after retirement.

The increase in saving needed to fund retirement is even more dramatic if households begin saving for retirement at ages 35 or 40. Now optimal saving

rates rise to 24.1 percent, in the low return simulation, versus 14.3 percent using historical returns for a single worker who begins saving at age 35. If the household waits until age 40, the optimal savings rate rises to 27.5 percent. Even in a moderate return scenario, optimal savings rates are 24.8 percent for a single household and 22.8 percent for a couple. Both single and joint households who use historical asset returns to project optimal savings rates would save near the employee contribution limit for those with incomes of $100,000. At lower interest rates, this amount of saving is not nearly enough to sustain a lifestyle for those retiring at age 65.

Fortunately, most workers are able to defer retirement to a later age. This allows them to save less during their working years, resulting in an improved lifestyle both before and after retirement. Despite deferring retirement for a few years, increases in longevity will not necessarily result in fewer years spent in retirement. For this reason, a reasonable alternative is to delay retirement since doing so increases the number of years of savings (and asset growth), reduces expected longevity, and increases Social Security income. Table 3.2 shows how optimal savings can be reduced (or lifestyle today can be improved) by delaying retirement for a household that begins to save at age 35.

A couple earning $250,000 could reduce its saving rate from 26 to 18.7 percent if it deferred retirement from age 60 to 70. The benefits of deferring retirement are even greater in a low return environment. A couple using historical rates would need to save 16.4 percent of income to retire at age 60, versus 12.2 percent if it retired at age 70. Workers who are shown realistic projections of lower expected returns may be more likely to choose a later retirement date, while those who project their retirement savings using historical returns may falsely believe that modest savings rates will allow them to retire at age 65.

Conclusion

In recent decades, prices for stocks and bonds have risen well above their historical averages. Higher asset prices imply lower expected future asset returns, so workers who rely on historical asset returns to project optimal retirement savings are at risk of unexpected shortfalls.[1] Improvements in longevity have also increased the cost of retiring at a given age. Workers, employers, and policymakers who rely on historical asset returns to make saving recommendations may fail to recognize how sensitive optimal savings rates are to persistent low investment returns. Our simple life cycle framework suggests that saving rates would need to rise by roughly two-thirds for most Americans given persistent low returns. Also, higher-income workers are most at risk of under-saving if they use historical asset return projections.

Appendix: Methodology and Data Details

We build on the model of Blanchett and Idzorek (2015) in our analysis.

Retirement income goal. Our model assumes that the individual seeks to maintain his or her level of after-tax (i.e., take-home) pay during retirement, compared to his or her after-tax income immediately before retirement. Retirement is assumed to commence at age 65.[2]

Change in annual retirement income need. Many retirement income models assume that retiree consumption (i.e., the annual retirement income need) increases annually with inflation throughout retirement (i.e., constant real spending), yet Blanchett (2014), among others, suggest that actual retiree spending need not increase by inflation throughout retirement. Our model assumes that retirees tend to decrease spending in retirement in real terms, although the relationship varies by the total level of household spending. In particular, we assume that the annual retirement spending need changes (ΔAS) during retirement for a given age (*Age*) and for a given target spending level (*SpendTar*) as follows where the maximum annual real change is +1 percent and the minimum annual real change is −1 percent:

$$\Delta AS = 0.00008(Age^2) - (0.0125 * Age) - 0.0066\,\mathrm{In}(SpendTar) + 54.6\% \quad [A1]$$

Figure 3A.1 shows how the real retirement income need changes for three target spending levels: $25,000, $50,000, and $100,000 from ages 65 to 100.

Income growth model. To trace workers' earnings over the life cycle, we have estimated regressions using data from the IPUMS-CPS (Flood et al. 2015). To be included in the analysis, individuals had to be coded as employed, working at least 20 hours a week in all jobs, and have annual total wage compensation of at least $5,000.[3]

It is assumed that an individual in a given earnings percentile (e.g., the 15th percentile) remains in that percentile for his or her entire working career (see Figure 3A.2).

Savings growth model. A common assumption in retirement planning models is that deferral rates remain constant as the individual ages. Nevertheless, this does not track actual investor behavior. Our research suggests that a more realistic accrual path has saving rates increase by approximately 25 percent over 10 years. For example, a 35-year-old saving 10 percent of pay would be assumed to be saving 12.27 percent at age 45, but only 1.56 percent by age 55.

Retirement period. The base mortality table used for this analysis is the Social Security Administration 2013 Periodic Life Table (Social Security

Administration 2015). Mortality rates in the future are assumed to decline based on the G2 projection scale in the Society of Actuaries 2012 Individual Annuity Mortality Table (Society of Actuaries 2012). We further adjust mortality rates by a constant factor so that life expectancies are allowed to vary by income level.

Returns model. Three types of series were created for this analysis: bonds, stocks, and inflation. For bond returns, we first select an initial bond yield (i.e., seed value) for the simulation. This is the bond yield at the beginning of the retirement simulation based approximately on 10-year US bonds. For simulation purposes, the historical yield seed is assumed to be 5 percent.

Yields for subsequent years are based on equation (1.1), where ϵ_{Yld} is an independent white noise that follows a normal distribution with a mean of 0 and a standard deviation of 1.25 percent:

$$Yld_t = \alpha + \beta_1 Yld_{t-1} + \beta_2 Yld_{t-1}{}^2 + \epsilon_Y \qquad [1.1]$$

The resulting annual bond yield (Yld_t) is assumed to be bounded between 1.0 and 10.0 percent.[4]

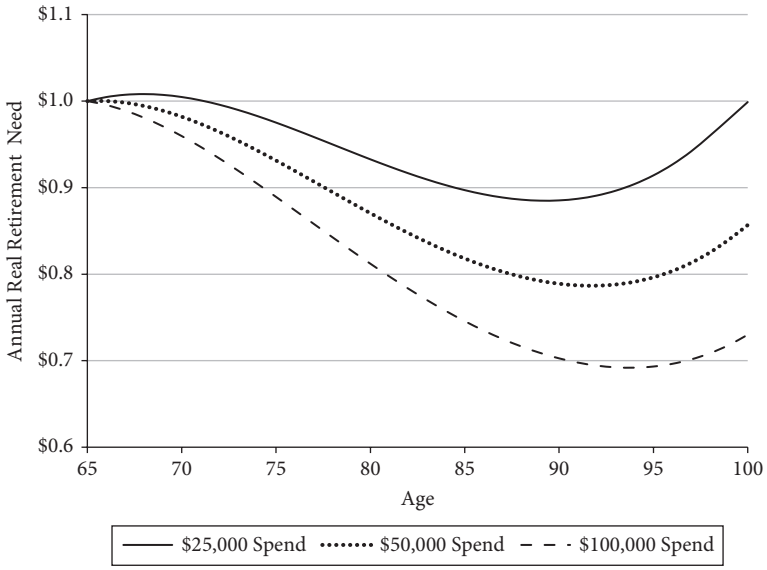

Figure 3A.1. The Spending Smile: lifetime real income target for various spending levels

Source: Blanchett (2014).

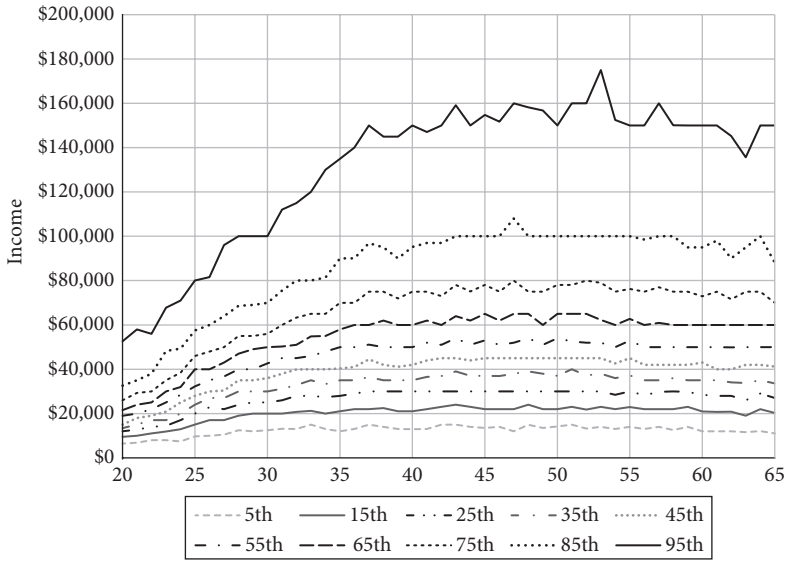

Figure 3A.2. Earnings curves at various income percentiles

Source: Bureau of Labor Statistics (2015).

After the bond yield for a given year is determined, the bond return (r_{bond}) is estimated using equation (1.2), where ϵ_{bond} is assumed to have a mean of 0.0 percent and standard deviation of 1.5 percent:

$$r_{bond} = Yld_{t-1} + \ -8.0(Yld_t - Yld_{t-1}) + \epsilon_{bond} \qquad [1.2]$$

The 1.5 percent standard deviation for the error term (ϵ_{b}) is not the assumed standard deviation for the asset class (bonds, in this case); rather it is the standard deviation for the errors around the regression estimates. The actual standard deviation of bond returns of 10.0 percent is higher because other factors (such as the yield and the change in yield) affect the actual variability of returns.

The stock return model is based on the yield for a given year plus the assumed equity risk premium (ERP). Therefore, we assume the following levels of ERP for the analysis:

	Historical	Low	Mid	High
ERP	5.5%	3.5%	4.5%	5.5%

Stock returns each year are based on equation (1.3), where ϵ_{stock} is assumed to have a mean of 5 percent and standard deviation of 20 percent, where Yld_t is the average yield for all years in that scenario:

$$r_{stocks,t} = \underset{Yld_t}{\leftarrow} + \epsilon_{stocks} \quad [1.3]$$

The inflation model is based on the loose historical relation between bond yields and inflation and is depicted in equation (1.4), where ϵ_i is an independent white noise term that follows a standard normal distribution with a mean of zero and a standard deviation of 0.5 percent:

$$r_i = 0.6\% + \ + 0.5\,Yld_{t-1} + \epsilon_i \quad [1.4]$$

Additional structure. Social Security retirement benefits are estimated based on the highest assumed average 35 years of earnings for each simulated participant. Social Security retirement benefits are estimated using the 2015 bend points (bps) and assumed to commence at age 65 on retirement.

The required level of retirement savings is determined using a solver routine, which determines the amount of savings or balance required to achieve an 80 percent probability of success during retirement.[5]

For simplicity, our model assumes that all savings are Roth contributions. For some scenarios, the individual is unlikely to have accounts sufficient to fund the Roth (e.g., if he or she needs to save $50,000). Portfolio allocations follow the Morningstar Moderate Lifetime Index glide path. The portfolio fee is 50 bps.

Notes

1. For a model which endogenizes retirement, work, and saving in a low return environment, see Horneff et al.'s Chapter 8 of this volume.
2. Alternative replacement levels are explored by Aon Consulting (2008) and Blanchett et al. (2013), among others.
3. The income definition is per individual (not household) and it only includes wage income (i.e., it excludes non-wage income such as pension benefits).
4. The coefficients vary by model type, as below:

	Historical	Low	Mid	High
α	0.25%	0.30%	0.30%	0.40%
β_1	0.95	0.55	0.65	0.50
β_2	0.00	0.50	0.50	0.65

5. While 80 percent may seem like a relatively aggressive estimate (e.g., some researchers use probability-of-success metrics that exceed 95 percent), it is important to look at the combined impact of the assumptions, and not to focus on a single assumption in isolation. For example, two of the most important assumptions when

estimating the cost of retirement are the assumed length of retirement and the target safety level (i.e., the target probability of success). Since the length of retirement period is relatively conservative (i.e., much longer than true life expectancy) the target success level need not be as conservative (e.g., it is possible to target an 80 percent chance of success versus a 95 percent chance of success). It is also important not to be too conservative with respect to assumptions (e.g., assuming a 99 percent probability of success), given the potential impact on consumption during retirement. After all, dying at an advanced age with a major portion of savings untouched is another form of retirement 'failure' (except, of course, in the case of a planned bequest).

References

Aon Consulting (2008). 'Replacement Ratio Study: A Measurement Tool for Retirement Planning.' Aon Consulting White Paper. London, UK: Aon Consulting.

Blanchett, D. M. (2014). 'Exploring the Retirement Consumption Puzzle.' *Journal of Financial Planning* 27(5): 34–42.

Blanchett, D. M., M. Finke, and W. D. Pfau (2013). 'Low Bond Yields and Safe Portfolio Withdrawal Rates.' *Journal of Wealth Management* 16(2): 55–62.

Blanchett, D. M., M. Finke, and W. D. Pfau (2017). 'Planning for a More Expensive Retirement.' *Journal of Financial Planning* 30(3): 42–51.

Blanchett, D. M., and T. Idzorek (2015). 'The Retirement Plan Effectiveness Score: A Target Balance-Based Measurement and Monitoring System.' Morningstar White Paper. Chicago, IL: Morningstar.

Bureau of Labor Statistics (2015). Current Population Survey—2015. Washington, DC: BLS. https://www.bls.gov/cps/cps_over.htm

Chetty, R., M. Stepner, S. Abraham, S. Lin, B. Scuderi, N. Turner, A. Bergeron, and D. Cutler (2016). 'The Association between Income and Life Expectancy in the United States, 2001–2014.' *Journal of the American Medical Association* 315: 1750–66.

Federal Reserve Bank of Cleveland (2017). *Inflation Expectations: Historical Data.* Cleveland, OH: Federal Reserve Bank of Cleveland. https://www.clevelandfed.org/~/media/content/our%20research/indicators%20and%20data/inflation%20expectations/ie%2020170714/ie%2020170714%20xls.xls?la=en

Federal Reserve Bank of St. Louis (2017). *Economic Data Series.* St. Louis, MO: Federal Reserve Bank of St. Louis. https://fred.stlouisfed.org

Flood, S., M. King, S. Ruggles, and J. R. Warren (2015). "Integrated Public Use Microdata Series, Current Population Survey: Version 5.0." Minneapolis, MN: University of Minnesota. https://doi.org/10.18128/D030.V5.0.

Horneff, V., R. Maurer, and O. S. Mitchell (2018). "How Persistent Low Expected Returns Alter Optimal Life Cycle Saving, Investment, and Retirement Behavior," in R. Clark, R. Maurer, and O. S. Mitchell (eds.), *How Persistent Low Returns Will Shape Saving and Retirement.* Oxford, UK: Oxford University Press, pp. 119–31.

Human Longevity Project (2017). *Human Longevity, Inc.* http://www.humanlongevity.com/

Immediateannuities.com (2017). Income Annuity Quote Calculator, (updated August 29, 2017) https://www.immediateannuities.com/

Morningstar (2015). 'Construction Rules for Morningstar Asset Allocation Index Family.' Morningstar Methodology Paper Version 1.2. Chicago, IL: Morning Star.

Social Security Administration (2015). *The 2015 OASDI Trustees Report: Period Life Expectancy*. Washington, DC: SSA. https://www.ssa.gov/oact/tr/2015/lr5a3.html

Society of Actuaries (2012). *2012 Individual Annuity Reserving Report & Table*. Washington, DC: SOA. https://www.soa.org/experience-studies/2011/2012-ind-annuity-reserving-rpt/