Inside the Global Economy
A Practical Guide

Andrew Vonnegut

2018
Central Banks, Interest Rates, and Money

Not long ago a book on the global economy would not have had a chapter on central banking and money. However, as Mohamed El-Erian noted in his suitably titled book, since the great recession, central banks are *The Only Game in Town*. Not only are they essential participants in domestic economic policy, but in the process of conducting that policy, they have a profound effect on global money flows. This chapter covers money, central bank operations and incentives, and actual and potential effects on domestic and global economies.

**MONEY, PRESENT AND FUTURE**

If global economics is about money moving around the planet, it probably makes sense to start by defining it. There are numerous resources on the history, definitions, management, and problems caused by money, so only the basics are repeated here. Money performs three functions in a modern economy:

1. **Unit of exchange.** You can use it to get the goods and services you need, and receive it for whatever goods and services you produce. It basically makes trade easier than if you had to trade whatever you make or do for each item on a grocery list. It is easy to see why money had to be invented when humans got out of their hunter-gatherer stage and barter was no longer a viable option.
2. **Unit of account.** Money can be used to measure and record the value of things and services.
3. **Store of value.** You can use money to store value and save it for later.
For a long time in the history of money, it was either made from something like gold or silver, or it was backed up by one or a combination of these two metals. Money that is backed up by metals at a fixed ratio is usually referred to as a **gold standard**. Under a gold standard, new money cannot be brought into circulation in the economy unless more gold is obtained to back it up. This limits the amount of money in circulation, and so naturally limits monetary policy. Basically, there is no monetary policy outside of getting more gold. This constraint is considered either a strength or a weakness of the gold standard depending on your politics. Historically, such a system has usually lasted until the central authority runs low on gold and decides to go ahead and issue more money anyway.

The United States established and maintained a loose form of global gold standard after the Second World War to help stabilize the currencies and economies of the major combatants in the war. For several decades up until 1971, every dollar issued in the United States was backed up by a quantity of gold at the rate of one ounce for every $35. At the same time, by agreement the major European currencies were all pegged to the USD at fixed rates, so in theory their currencies were also backed by gold. They just needed to exchange their currencies for dollars, and then they could go exchange those dollars for gold. It was in reality more nuanced than that; see the footnote for references. As of 2017, no country any longer uses a gold standard, although the debate occasionally resurfaces.

National currencies are normally now “flat” currencies; that is, currencies that exist because the laws and regulations of a country establish it as “legal tender.” A flat currency is not backed by any precious metals and can be created (and destroyed) more or less at will, or by “fiat.” Its value is determined solely by supply and demand. Supply is mainly determined by commercial banks (more on that later), central bank policies, and the bank regulatory system. Demand is driven by the underlying strength of and activity in the economy and, weird as it may seem, the amount of “faith” that people have in the currency and its management. Yes, currency values when currencies are not backed by specific amounts of precious metals or anything tangible are “faith-based,” which to date has worked well, as long as faith is maintained.

What faith is a currency is lost, however, values can plummet, as seen in cases throughout history and regions. In Bulgaria in 1997, people lost faith in their monetary authorities and abandoned their currency mainly for German marks. At one point, few in the country would accept the Bulgarian lev. This has not happened with a major currency for some time, though the Russian ruble perhaps had a brush with abandonment in early 2015. In more minor currencies, the Zimbabwean dollar fell precipitously through the 2000s and the Venezuelan bolivar may be heading for equal infamy in 2017. A common consequence of lost faith is hyperinflation in the local currency, as demand for the currency dries up and it loses its purchasing power.

True fiat money-based national currencies have really only been the norm since the United States moved away from the quasi-gold standard in the 1970s. That is a relatively short time period in the over two-thousand-year history of money. The system seems to be working fine for the time being as a medium of exchange, and certainly fine enough for people to want to move and chase fiat money all over the planet. The future may see additional evolution in the forms that currencies take. Increasing interest and use of virtual fiat currencies such as Bitcoin are made possible by large amounts of distributed computing power and wide connectivity. Their populism may herald at least a partial displacement of national currencies at some point in the future. Not issued by any central monetary authority, they are in some ways the ultimate fiat currency, moving even further away from any sort of precious metal standard. Virtual currencies have become popular in recent years largely because of tax avoidance and anonymity, where illicit products can be bought and sold without alerting authorities. Just like cash, except you don’t have to be there to hand it over or pick it up.

Virtual currencies will probably continue to gain in popularity, especially as security issues get resolved. Bitcoin has run into a number of problems with theft, which have probably kept it from being more widely popular even as its value increases. The economist Hyman Minsky once said that anyone can create a currency; it is getting people to accept it that is hard. So far virtual currencies have not been widely adopted and are still in their infancy, with numerous contenders besides Bitcoin. It is possible that the next virtual currency will emerge serendipitously from one of the numerous online payment clearance systems. It would be a (long) series of small steps from denomination in one currency or another to some more neutral medium of exchange, which could then take on increasingly currency-like characteristics.

In chapter 1, the term “money” was used loosely and largely incorrectly as a proxy for wealth, as noted there. I promised a correction was coming. Economists define money in diverse ways, which can vary from the concept of wealth used in chapter 1. Money supply in an economy is normally measured using M terms. M1 is the most restrictive, and is the total supply of currency and checking deposits; that is, the money that is easiest to get hold of and spend. M2 is a broader definition and includes M1 plus savings and smaller time deposits less than $100k in the United States and similar amounts in other countries. M3 is more expansive and includes M2, plus larger time deposits and is one way of defining what is called “broad money.” The wealth discussed in chapter 1 is a combination of all these, plus longer-term investments.

**CENTRAL BANKING, PRINCIPLES AND REALITIES**

Central banks are favorites of critics from across the political spectrum as shadowy instruments of the government (from the right) or evil instruments of greedy capitalists (from the left) set out to devalue and destroy national currencies (libertarian viewpoint). The financial press attributes divine qualities to central banks as the single entities capable of saving a floundering economy. It is hard to figure out if central banks are the big, scary smoking machine in The Wizard of Oz or the harmless little
null
mutes in the economy. In practice, it definitely affects the interbank lending rate, but the influence on other rates can be less clear. Commercial banks usually only borrow from the central bank when they need extra money to clear the interbank transactions that are required when customers move money from place to place. Even then, the bulk of lending happens in times of panic when interbank lending margins dry up. Under normal conditions, commercial banks don’t borrow much from central banks. Borrowing is especially unnecessary in economics carrying out quantitative easing where banks have plenty of reserves to clear transactions (much more on this later). Not borrowing from central banks serves the direct channel by which a discount rate translates to lower rates in the economy, mitigating the effect of this policy lever. That said, financial institutions do watch this benchmark rate as an indication of where the central bank is trying to steer things. Setting expectations is a surprisingly important part of central banking, even when direct effects may be elusive.

Despite popular conception, modern, developed-economy central banks don’t create much money at all. They mainly create reserves, and banks don’t lend reserves. Almost all of the money in the economy is created by commercial banks. When banks create loans, they create deposits, and in doing so create money. Banks don’t need a central bank to create money for them. They have a banking “lend” which allows them to create money in the process of making loans. A central bank’s ability to create money (at least under conventional monetary policy) is less impressive when looked at in this broader context. People, especially errants and ravers on TV, talk a lot about central banks “printing money.” In a modern monetary system even in desperate times, this is rare. And in any case no one “prints” much money anymore.

Despite the aforementioned limitations, central bank rate policy does matter. Voting against a central bank is risky, so interest rates do tend to align around the rate targeted by the central bank. Also, if the central bank is lending at a low rate, banks in need of liquidity would be foolish to borrow at a higher rate from somewhere else. By keeping rates low, central banks encourage people to borrow, and so encourage the banking system to create money by making loans to fulfill demand for money. In contrast, higher rates would discourage people from borrowing, and lead to fewer loans and less money creation. That is how it works at least in theory. Practice and reality, as we will see, can be more complicated.

**Unconventional tools** are those used outside of “normal” conditions, or when conventional tools are not having the desired effect. That was the case during and in the aftermath of the great recession. The Bank of Japan had been using such tools for some time, following its economic crash in the 1990s. The US Fed and the Bank of England began in 2008, with the ECB a bit later, mainly because of differences in mandate and conservative German dominance of the ECB. German memory of hyperinflation in the 1930s continues to color their attitudes toward aggressive monetary policies.

**Unconventional tool #1.** During the great recession the Fed and Bank of England realized that buying their usual quantities of their usual government bonds was not having much effect on the economy. So they started doing what the Bank of Japan had previously, buying a lot more government bonds of different, longer maturities and also buying commercial bonds, mainly mortgage bonds, from both banks and other investors who held them. This was a controversial move and had a cryptic name—**quantitative easing** or QE—to preserve the mystery of the central banking system among the public (not really).

Where conventional policy stops and where QE begins is a somewhat nebulous point and, of course, the subject of the kinds of hair-splitting debate that economists are notorious for. For the most part, QE begins when the central bank purchases anything other than its normal mix of short-dated government bonds, and/or when the quantity of reserves created get larger than what banks actually need to settle accounts between themselves. Most QE programs stick with interest-bearing instruments. However, considered unorthodox even by the standards of central bank orthodoxy, the Bank of Japan’s more aggressive program has purchased large quantities of ETF’s, making it a major owner of shares in Japanese companies.

Since banks have little reason to hold reserves in excess of what they need, central banks may pay interest on reserves to entice banks to play their game. The Fed started doing this in 2008. As a nonstereotypical departure from conventional policy, doing so in the United States required congressional authorization. The ECB has actually gotten away with paying negative interest on accumulated excess reserves, simply requiring banks to hold them as part of the ECB’s QE program.

QE has various goals, depending on how it is carried out. Buying longer-dated government bonds, mainly at three- to ten-year terms and beyond, pushes upward pressure on price and lowers yields (or the real rates) on those bonds. Whereas conventional monetary policy mainly affects short-term rates in the interbank market, QE can help decrease interest rates on the large stock of longer-term debt in the economy. Also, by buying mortgage-backed securities when the market for them was illiquid, the Fed became a sort of buyer of last resort, providing liquidity to a market that was beset by panic. Investors were able to get valuable assets off their books, stabilizing their balance sheets and freeing up cash for investment in other areas. As they reinvested in other assets, prices rose and yields dropped on those as well. One knock-on effect was lower corporate bond interest rates, thereby increasing cash flows to the larger corporations in the bond market. Finally, paying interest on the reserves that were created helped recapitalize banks hit by the recession.

When central banks buy assets from banks during QE, just like with regular open-market operations, there is no net “money” or assets created in the traditional sense. One type of asset in the system is being traded for another. Central banks obtain the bonds (assets) and create reserves (liability); commercial banks gain reserves (assets) and create bank deposits (liability); sellers gain cash and lose their bond asset. Again, the net worth of the system does not change, at least according to the accounting relationships.
That last caveat about the accounting relationships appears because of considerable heated debate about whether money is actually created during QE. From an accounting perspective, it is an asset swap where net assets in the system do not change. However, the debate continues along a couple of lines. The first is whether it matters when assets change shape and get more liquid (i.e., get turned to cash). If the sellers take the cash and go buy goods and services, new money enters the broader economy with potentially both stimulating and inflationary results. That does not happen in practice with QE. There is no clear transmission mechanism between asset purchases under QE and money entering the consumer economy. Sellers normally use the transaction as a chance to rebalance their portfolios into new assets with different risks, returns, and/or terms. The sellers are investors in asset markets, not consumers, and any price effects would happen in asset markets.

Whatever one's stance, some money was almost certainly created if the assets were bought in imperfectly liquid markets. Any time a large new buyer enters a market, prices shift upward. That is supply and demand. Net money creation then would be the difference in pricing that occurred with the entry of the central bank into these markets. In some areas of the markets like medium-term treasuries, the price difference may not have been much. In the market for mortgage-backed securities, especially early on, it was likely greater. This is supposed to happen; asset inflation is the mechanism by which QE works.17

An important question is where investors reinvested the proceeds they received through QE purchases. Anecdotal and some empirical evidence suggests it was reinvested in government bonds, other assets domestically and abroad (especially bonds and the creation of lines of credit to foreign banks), back into property through corporate channels (seen as lower risk than individuals), in the so-called shadow banking system that then lent to a variety of end consumers, and back to large businesses that are less risky than smaller businesses and consumers.18

Figure 4.1 shows the increase in Fed, European Central Bank, and Bank of Japan asset balances since 2006. It represents the total value of bonds and other assets that the central banks have bought since 2008, with corresponding amounts being deposited in commercial banks' reserve accounts. For the Fed, the total is around $3.3 trillion of additional reserves between 2008 and 2015 when QE was ended.19 The Fed basically quadrupled the size of the balance sheet it held in "normal" times. The situation is similar for the other central banks.

How to conduct monetary policy in a post-QE environment is one of those questions that keep some central bankers up at night. In uncharted territory, economists don't agree on how and with what effects the asset positions will be unwound. In any event, large reserve positions may well undermine the use of the discount rate as a future policy lever to combat inflation. Some sources do not see any problems, while others, including the BIS, see possible complications ahead.20 Perhaps one of the biggest questions is to what extent central banks' basic mandates were fulfilled with QE, maintaining a stable economy and an inflation target. Lacking clear counterfactual cases, the costs and benefits of QE during this period will be analyzed and debated for decades to come.

Unconventional tool #2 and beyond. Central banks are normally mandated to be what is referred to as the “lender of last resort.” That is, if liquidity dries up in the banking system and banks will not lend to each other to settle transactions, the central bank can step in and lend. This is something of an extension of conventional tool #2, but for different reasons under different circumstances. It was common in the early days of the great recession. Following panic and illiquidity in the overseas dollar market, the Fed even extended extensive credit lines to foreign central banks as an international lender of last resort. Given the increased size of dollar markets since 2008, there is some question whether the US Fed could do that as effectively again.

In theory, this money-creating tool could be extended even further and central banks could actually create real, not money and inject it into the nonbank economy. Economists refer to this as helicopter money, after Milton Friedman coined the term in 1969. Central banks could directly purchase government bonds at auction, rather than only in the secondary market. They could also directly finance companies' or credit consumer accounts. Helicopter money is generally considered to be a poor policy choice that could radically undermine the "faith" in a fiat currency and lead to currency flight and hyperinflation.21

At this time, no major economy engages in helicopter financing. However, it is worth questioning when large-scale, long-term purchases of government bonds in the secondary markets start to resemble direct financing of government spending. As
of mid-2017, the aggressive Japanese QE program has led to the BOJ's holding over one-third of Japan's public outstanding debt stock.24 Certainly, the BOJ's willingness to sop up bonds in the secondary markets affects investors' willingness to buy the bonds in the first place, helping ensure ongoing demand for debt to finance deficit spending. The gap between BOJ policy and helicopter money gets more tenuous as time goes on. As economies battle with low growth in a deflationary environment, direct money creation will become more tempting. For the first time in many decades, helicopter money is getting serious airtime in policy circles.

That covers the main so-called conventional and unconventional tools. Most central banks also regulate banks and influence their lending practices. Bank regulation is not as frequently considered an economic policy tool, but given the role of lending in money creation, perhaps it should be. Central banks usually set commercial banks' reserve and capital requirements. The reserve requirement is the amount of reserves a bank needs at the central bank, usually a percentage of the total amount it is authorized to lend. The reserves ensure that banks can meet their clearing needs with other banks when people move money between banks.

The capital requirement is similar, but is the percentage of the total amount a bank can lend that must be held as capital, usually equity, in the bank. Capital is a buffer against changes in the value of the bank's balance sheet. Higher levels are considered safer, but are restrictive of lending. Banks tend not to be reserve constrained, both because of current huge excess reserves after QE and because they can just borrow from the central bank to cover. However, they are often capital constrained, so increasing the capital requirement can reduce the amount of money that commercial banks create through loans.

To control risk in the system, central banks and other authorities set rules on the conditions under which loans are made. The low interest rates and the stabilization of bond market balances through QE were meant to return normalcy and lending to the financial system. At the same time, to reduce risk after the last debt-fueled crisis central banks implemented regulations that have decreased lending in certain areas. In particular, banks' lending to economically important consumers and small to medium-size businesses decreased post-recession at least partially because of these regulations. Interest rates may be low, but loans are harder to get. More on this later, but: bank regulators should consider the idea that bank regulation may influence economic activity as much as the discount rate and open-market tools.

Keep in mind that since this is being written in 2017, the focus has been on lowering interest rates and getting people to borrow and banks to lend and create money. If the economy were booming along and there was inflation, central banks would throw these levers into reverse to try to increase interest rates, decrease people's interest in borrowing, and slow the rate of money creation.

It would seem the ability to create money at will and control interest rates are awesome qualities to justify any wonder that a mortal might feel toward central banks. As seen, in reality central banks actually create very little net money. Also, part of the reason for such awe is the lingering assumption that interest rates are the tiller by which an economy is steered in the modern globalized economy. The assumption is based on two main assumptions about central bank policy and interest rates.

The first assumption is that central bank interest rate policies determine the rate at which money is lent into the broader economy.

As economic activity slows, central banks use their policy levers to lower interest rates, hoping to get cheap loans out in the economy to stimulate more borrowing, investing, and related economic activity. This is the textbook mechanism. After central bank responsiveness to the great recession, rates on government bonds dropped and rates on corporate borrowing followed suit. Whether lower policy rates extend to a broader range of borrowers is less clear. Let's look at some data from the United States in table 3.1.

Lending rates did go down, but not evenly. The policy discount rate dropped the most, and others followed to a more or lesser degree. They dropped the least on the two rates that are perhaps most poised to stimulate the economy, consumer and small business lending. They dropped the most on large commercial loans, at a time when US companies had large cash stores (on average). After a financial crisis, lenders have usually been burned and don't want to make cheap loans to their riskiest customers, such as consumers and smaller businesses. New, tighter bank regulations make it harder to do that anyway. Consequently, interest rate policy has limitations just when it needs to work the most. While some rates drop, they are perhaps not the ones most likely to jump-start economic activity.

The second key consumer rate, on mortgages, came down significantly. Whether that helped stimulate the economy or not leads to the second assumption about central bank interest rate policy effectiveness. This is the "easy money" assumption. For policy to work, more money needs to be loaned or (borrowed by) spending consumers and investing companies. During the housing boom, a consumer who gets a house for free in a rising market doesn't care about small changes in the interest rate. The Fed gets blamed for inflating the housing bubble with low interest rates, but rates are probably not the main culprit. The availability of easy money trumps cheap money. And money was easy.24

<table>
<thead>
<tr>
<th>Table 3.1. Selected Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Discount rate</td>
</tr>
<tr>
<td>Prime rate</td>
</tr>
<tr>
<td>Mortgage rates</td>
</tr>
<tr>
<td>Consumer lending, credit cards</td>
</tr>
<tr>
<td>Commercial loans</td>
</tr>
<tr>
<td>Small business loans</td>
</tr>
</tbody>
</table>

Sources: Federal Reserve, Freddie Mac, SBA. Small business loan rates are for SBA loan programs rate at January of each year.
By 2012, money was cheap but easy. It was cheap to the banks but they were unwilling to lend to firms. Lenders were nervous and continued to hoard cash which was an underestimate of the domestic economy's overall problems. With (Q), it is important to understand the domestic economy's own domino effect. The broader economy can be cushioned by monetary policy and inflationary policy through low interest rates and stimulus spending. Table 3.3 shows some data on interest rates and inflation for select countries.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>8.5%</td>
<td>15.1%</td>
<td>18.2%</td>
<td>17.0%</td>
<td>3.2%</td>
<td>10.1%</td>
<td>8.0%</td>
<td>7.3%</td>
<td>6.7%</td>
<td>7.0%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6.9%</td>
<td>4.6%</td>
<td>3.3%</td>
<td>4.0%</td>
<td>7.6%</td>
<td>5.5%</td>
<td>11.2%</td>
<td>13.0%</td>
<td>4.1%</td>
<td>4.6%</td>
<td>0.1%</td>
</tr>
<tr>
<td>China</td>
<td>16.7%</td>
<td>22.1%</td>
<td>16.7%</td>
<td>17.8%</td>
<td>28.4%</td>
<td>18.6%</td>
<td>17.3%</td>
<td>14.4%</td>
<td>13.6%</td>
<td>11.0%</td>
<td>13.3%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>13.8%</td>
<td>14.1%</td>
<td>15.6%</td>
<td>17.8%</td>
<td>-0.1%</td>
<td>4.0%</td>
<td>7.4%</td>
<td>8.0%</td>
<td>2.1%</td>
<td>-2.5%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Japan</td>
<td>0.5%</td>
<td>-0.7%</td>
<td>0.6%</td>
<td>0.7%</td>
<td>2.1%</td>
<td>3.7%</td>
<td>2.9%</td>
<td>2.2%</td>
<td>3.8%</td>
<td>3.0%</td>
<td>3.1%</td>
</tr>
<tr>
<td>United States</td>
<td>8.1%</td>
<td>9.0%</td>
<td>11.7%</td>
<td>8.2%</td>
<td>5.5%</td>
<td>-2.7%</td>
<td>6.7%</td>
<td>4.9%</td>
<td>4.4%</td>
<td>5.1%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>
Strangely enough, central bank actions can have a more well-defined effect on the global economy. This is the case both in the countries with the main reserve currencies and emerging markets. The next sections finally get us out of the domestic and into the global economy.

GLOBAL EFFECT #1: EXCHANGE RATES

Though central banks may not influence all interest rates in an economy, they do affect some of the main ones global investors care about, such as government and corporate bond yields and the cost of lines of credit extended to foreign banks.

Investment managers scan the globe for the highest returns, in what is called the global search for yield. All other things equal (and that is important), when interest rates go up in a country, investors follow. The higher the interest rate difference, the more investors will leave the economy with the lower rate for the one with the higher rate. When investors do that, they sell the currency they were basing and buy the one they are investing in. Since currency prices are subject to the forces of supply and demand, this buys the value of the currency of the economy with the higher rate, while putting downward pressure on the exchange rate of the currency with the lower rate.

The next point is important and is probably a bigger driver of both exchange rates and investment returns than the actual interest rate. If you are an early investor, you not only get the higher interest rate, but you also benefit from currency appreciation as other investors follow you. The opposite holds on the exit, and investors who get out late can suffer losses from currency depreciation that rapidly overshadow interest rate points. The rush to get in and out is a big reason that currencies, especially in emerging markets, bounce around so much.

Interest rate increases can be such a good way to increase currency values that they may be implemented just for that purpose. The Turkish central bank increased rates in January 2014 after the Turkish lira dropped nearly 20 percent against the euro and USD. The action helped stabilize the lira as demand increased when investors took advantage of the higher rates. The Russian central bank did the same thing in December of the same year, hiking interest rates 6.5% percent in the middle of the night. In that case, things were going badly enough in the broader economy that it did not make much of a difference and the Russian ruble continued to fall. However, once the pain subsided, the higher interest rates almost certainly did help the subsequent ruble recovery.

Longer-term differences in broad central bank rate policy can also affect exchange rates. As mentioned, the ECB has traditionally been more aggressive about controlling inflation than the Fed, so under similar circumstances would tend to keep rates higher. As the United States was pulling out of the recession in 2012 the Fed kept rates low. The ECB kept rates fairly high and was more conservative about quantitative easing than the Fed. Consequently, even though the US economy was growing faster, the USD did not climb much against the euro. People were still chasing higher bond rates in the eurozone. This all changed later, as the ECB implemented its own QE program and the USD rose as it tapered back on its program.

As with most rules in economics, interest rate changes affect exchange rates “all other things equal.” Often all other things are not equal. Interest rate increases when something is seriously wrong with the economy won’t have the same effect. That was the Russian case, mentioned above, as well as the cases of the Asian and Latin American crises of the 1990s. Similarly, when Greek government bond rates went up in 2010, money did not immediately follow those higher interest rates even though they were denominated in euro. People were worried about default, an exit from the euro, or both. To reliably move exchange rates, the risks should be more or less similar before and after a rate increase, though much higher interest rates can at least partially compensate. When there are problems in an economy, investors will require a risk premium on rates, and sometimes even high rates will not be enough to compensate for risk.

Frequently, when investors buy into bonds in a different currency from their own, they hedge with futures contracts or derivatives that allow them to minimize exchange rate risk. The real increase in interest rates that they get after paying the costs of the hedge is called the covered interest spread. Hedges can be expensive, though, and quickly eat into the real spread.

Some data can illustrate both how central bank interest rate policy affects exchange rates, and the important role of market psychology in the global economy. In May of 2013, the Fed signaled that it might, maybe, at some point decide to cut back on (or “taper”) QE and reverse its policy of buying assets to put downward pressure on medium-term interest rates. Emerging markets currencies and stock markets slid as investors fled back to the USD, interpreting the Fed’s signal as suggesting, all other things equal, that interest rates would rise and long-term US dollar denominated securities. In January of 2014, the Fed subsequently announced a fairly modest reduction in bond buying under its quantitative easing program, and there was some recovery. Figure 3.2 shows these drops and the slight though temporary recovery among the emerging markets currencies.

Why would an announcement by the Fed that it would slowly reduce the bond buying under QE cause these emerging markets currencies to drop? First some background. After the recession, with post-recession interest rates low in the developed market economies, investors had been seeking out higher rates of return in emerging markets. Evidence indicates that some of the proceeds from selling bonds during QE also ended up in emerging markets. In all, with the reduction of developed market interest rates to near zero in 2008 and 2009, several trillion USD made its way to emerging markets, helping drive up asset values, economic growth, and the value of the currencies.

Now to 2013. A planned reduction in QE meant that at some point longer-term US rates might start to go up, so investors moved money back into USD and out of those currencies. In fact, medium- to long-term USD bond rates did not increase...
and actually continued to fall for some time after the announcement was made. This is where psychology comes in. Investors now what happens when interest rates change, and figured that they better get out before USD rates went up and the emerging market currencies dropped. The drop became a self-fulfilling prophecy. Anyone who did not panic and bail out could get left behind and be stuck re-entering to USD at a lower rate. Adding to the tinderbox, some weaknesses had already begun to appear in these economies before May 2013, with capital inflows well below previous peaks. Investors were getting nervous before the announcement, compounding the effect when it finally happened.

The global economy is complex, with events playing out in different ways in different markets. One of the world’s largest bond investors bet on rising interest rates anticipating the end of QE. However, instead of being praised as a visionary for getting out of a market before it dropped, he lost billions. Bill Gross, the founder and CEO of PIMCO, the world’s largest bond trader and bond fund manager, felt that the end of QE would see increases in interest rates as all the extra liquidity left the market. As such, he announced PIMCO’s exit from government bonds early on in 2011. Unfortunately, rates continued to drop and bond prices rose for years afterward, costing his company and investors billions of dollars, and his ultimately his job.

Emerging markets investors with itchy fingers on sell buttons did not want to get stuck if rates went up. So they created a self-fulfilling prophecy that led to a drop in emerging markets currencies well before any real change in policy. At the same time, Gross did not want to be the last one stuck in a global sell-off of US treasuries, so got out sooner rather than later. However, there simply continued to be enough demand for treasuries even after the “tapering” of QE that bond prices kept going up and interest rates down.

It turns out that QE was perhaps not as asset inflationary or interest rate depressing as some people had thought, at least as far as government bonds were concerned. In one case, the thought it might be was enough to wreak havoc on a bundle of emerging markets’ currencies. In another case, the reality that it was not led to the demise of the career of a man referred to as “the king of bonds.”

Even if central banks’ have challenges spurring lending to real humans in their own economies, rate changes or rumors of them can affect exchange rates in unintended and unintended ways. These cycles of interest rate adjustments, yield chasing, and risk fleeing have repeated themselves over and over in the world, driving booms and busts. The cycles have been and are likely to continue to be a reliable part of global economies, though the timing less so.

**GLOBAL EFFECT #2: ASSET BUBBLES (AND BUSTS)**

When credit increases, it goes somewhere. The low-interest money created by banks since the recession may not have gone to consumers and small businesses. But it did get invested. Similarly, the liquidity created by QE went into other assets once the bonds were sold to the central banks.

When central banks promote liquidity and keep rates low and commercial banks are creating money, the investors (note: not consumers) who end up with the money will seek out the best returns they can for their risk profiles. This creates demand for other assets, driving prices up. If investors are after higher returns, the assets they buy will be riskier than short-term, developed-economy government bonds (which are the safest out there). As more investment enters other asset markets, prices will go higher than they otherwise would have in a non-QE equilibrium. Higher prices for assets whose underlying risk has not changed can ultimately lead to increased volatility as investors’ fingers get twitchy on the sell button, not wanting to be the last one out if markets fall.

In the monetary expansion of 2008–2014, a number of asset classes globally began to increase in value. Though capital flows data is not definitive, price increases provide some indication of where the liquidity went. These include US domestic stocks, US high-yielding debt (aka junk bonds), foreign stocks, foreign bonds, real estate, and automobile loans. If interest rates on safer assets go up, money could flow out of these riskier assets, just like it did out of emerging markets securities. Of course, the inflection point where investors start to react and sell is hard to identify. It depends on many factors, only one of which is the set of core interest rates influenced by central banks.
Central banks also don’t know whether, how soon, and by how much they should raise rates in response to employment conditions. It’s a hard job. The relationship between unemployment and inflation can be affected by productivity, the possibility of import substitution, the shifting importance of the labor component in production and service provision, the structure and flexibility of companies and the workforce, how competitive the market is, as well as other factors. On top of all that, central bankers need to keep in mind that increased wages might actually be a good thing for the economy overall, especially in light of increased inequality and the importance of consumption in GDP growth.

A final reason for inflation, which has historically been more evident in emerging and frontier market economies, is currency depreciation driven by a loss of faith in the currency. When people bail out of a currency, the value drops relative to world market prices and those goods become more expensive in local currency terms. This is a fascinating event that happens fairly frequently to different degrees. Global hedge fund managers watch these events carefully, both as opportunities to lose and make money. Some examples include emerging markets currencies during the so-called tsuba tantrums in 2013; the Russian ruble in 2014 and 2015; the Mongolian tugrik between 2012 and 2015 as commodity prices slumped along with faith in the economy; and the Bulgarian lev in 1997. Though depreciation for any number of reasons can set off inflation, it can be particularly sharp when there is a loss of faith involved.

An explicit part of all central bank mandates, inflation is one of the main indicators central bankers keep an eye on. Without going too much depth, generally inflation around 1 percent to 3 percent is considered “good.” Lower than that and people start to worry about deflation, which is dropping prices. The effects of deflation are, again, debated, but generally considered to be “bad,” mainly because real interest rates can become very high. A real interest rate is the interest rate minus (more or less), the inflation rate. If interest rates cannot go to less than zero, and if there is, for example, a −5 percent rate of inflation (i.e., deflation), then the real interest rate is 5 percent.

A real interest rate of 5 percent is considered fairly high, at least for slower-growth, developed market economies, making money expensive in a recovering economy. To break this lower bound on nominal interest rates, central banks in Europe and Japan have experimented with negative interest rates on certain funds held with them by commercial banks. So far, there has not been much pass-through effect to rates charged to companies and individuals, but time will tell. The main outcome of negative interest rates may end up being decreased bank profitability, as spreads tighten. Higher inflation than the 1 to 3 range is also considered “bad.” It is hard to say exactly what that is, but anything over 4 or 5 percent will definitely get the attention of a central bank and probably prompt an increase in interest rates to try to slow the economy down.

Since central banks make much of their policy based on inflation rates, global investors keep a close eye on them and their underlying drivers. A change in inflation
in a particular market can presage the kinds of capital flows that move currencies and markets, and drive both investment gains and risks.

SOME (REASONABLY EDUCATED) GUESSES ABOUT POLICY AND OUTCOMES

This section moves further into the unknown, briefly introducing some final topics on central bank policy, growth, inflation, and interest rates. To start, central banks' tool kit test on some postulated causal relationships that are the mainstay of textbook economics. Like many staples in economics, economists often disagree on them, they definitely do not always hold, and they sometimes seem to break down just when they matter the most. A discussion of some of them is included here as policies around them will drive ongoing interest rate changes and money flows between economies.

Assumption One: Low Interest Rates Lead to Increased Economic Activity

This may be true, but it need not be the case. Economic activity requires some combination of demand for consumer consumption and business investment, a willingness of banks to lend, and a desire for companies and consumers to take on debt to invest and consume more. In the most recession-afflicted countries, for most of the post-2008 recovery this failed to happen. During the run-up to the great recession, and as a major causal factor, consumers and businesses took on debt and ran into trouble when the economy fell apart. So they "leveraged" decreasing their debt, investment, and consumption, either by choice or because of job or profit loss or more stringent regulations. In such an environment, the channels by which low interest rates stimulate an economy are unclear.

While low interest rates cannot single-handedly create an economic recovery out of thin air, most economists would agree that higher interest rates will slow an economy and stymie recovery from a recession. So again, central banks may not help much by following the best policy, but can hurt by following a bad one.

It is worth digging a little more deeply into how low interest rates can influence economic activity. Table 3.4 outlines some channels that low interest rates (all other things equal, of course) can take through an economy, and some of the reasons they may or may not have the desired outcome.

It's not a simple relationship. Nor is it simple to determine when and to what degree different channels are likely to be reliable transmitters of interest rate effects. A lack of counterfactuals complicates historical analysis of a low interest rate policy. Regardless, awareness of the channels and their potential and limitations is a starting point for a better understanding and clearer analysis of particular situations. A similar table could be constructed for the effects of higher interest rates, with many of the same channels active, but in reverse. Despite current sentiment to the contrary, it is entirely possible that higher interest rates will be the main concern during the period that this book is in print.

| Table 3.4. |
| Channel | Channels and Comments |
| Increase GDP through the C or consumption component of GDP | if consumers are willing to borrow more to consume and banks are willing to lend, lower interest rates can help increase consumption and GDP. After a credit crisis like in 2008, banks may not be able or willing to lend and consumers may be shedding debt, so effects are muted. Lower interest rates increase prices of bonds and can have a secondary inflationary impact on other assets as investors go elsewhere for yields. This can have a wealth effect where people feel richer and spend more. This would affect those with large investment portfolios more than the middle class and below. |
| Increase GDP through the C or consumption component of GDP | |
| Decrease GDP through the C or consumption side of GDP | |
| Increase GDP through the I or investment component of GDP | |
| Increased profits for companies with debt, increasing f and C depending on what is done with profits | Can lead to capital flight from economy, seeking higher returns elsewhere |

Assumption Two: A Faster-Growing Economy Leads to Inflation

This relationship can but does not always hold, especially in the developed market economies where even high growth is not very high by global or historical standards. Some periods of high growth have seen low inflation, and vice versa. It depends on a range of factors. The converse is also not always true. The 1970s in the United States had a period of low growth and high inflation, or stagflation. Inflation and its varia-
Assumption Three: Higher Interest Rates Will Slow Inflation

Higher interest rates raise the cost of investing and borrowing to buy goods, so at the margin, people slow investing and buying. It is also more beneficial to save since returns are higher, so again, at the margin, people should save more instead of spending. Historically, in most countries higher interest rates have slowed inflation. If there are serious problems in the underlying economy, or if inflation is chronic, raising rates may not matter so much. For almost two decades, Turkey had an inflation rate that hovered between 40 and 80 percent with interest rates almost always higher than that.

Interest rate increases designed to counter underlying currency weakness and prop up exchange rates may also not slow inflation. This is particularly the case when consumers and especially retailers believe that inflation will be high. Retailers can rapidly lose working capital and their businesses from underestimating inflation, which is one reason that so called expectation-driven inflation is so hard to beat. Its roots are often in millions of individuals fighting for survival.

Assumption Four: The Fed and Other Central Banks Will Be Able to Increase Economy-Wide Interest Rates

Economists disagree on whether central banks' increased balance sheets will affect their ability to influence interest rates (and so control inflation) if inflation starts to rise. After QE, the discount rate matters less because banks no longer need to borrow to supplement their reserves. Central banks will target the interbank rate and so probably increase the rates they are paying on their huge reserve liabilities. Fortunately, increased rates are likely to coincide with either increased stability in or drops in central banks' bond portfolios, possibly helping by stopping up liquidity and limiting interest payouts. The economic and political implications of significantly higher payments to banks are not entirely clear.

Perhaps more importantly, interest rates like any price are primarily driven by supply and demand. The end of QE did not result in higher rates because there was enough additional demand in the market to make up for the loss of QE liquidity. If inflation starts to accelerate, will central banks be able to counter that demand with their traditional levers given the enormous amount of liquidity in the global economy?

These four and other similar assumptions may be broadly correct. However, questioning them and others like them and understanding the conditions of their validity is an exercise that will help refine an understanding of how monetary policy reacts to and affects a continually evolving global economy. Across various markets, we are likely in the coming decades to see multiple instances of high and low interest rates, attempts to control both inflation and deflation, and ongoing, often rapid movements in and out of different currencies. These events will take place in an at least slightly (and sometimes radically) different context than they previously occurred. Questioning assumptions and understanding when this time things really are different helps keep our understanding updated and reactions to them nimble. The second section of this book outlines some, occasionally a bit outrageous, scenarios that also challenge assumptions in looking toward the future.

Much of this book has by default focused on a state of low interest rates. This chapter ends with a few notes on what might be expected in an increasing interest rate environment.

Effect One: Bond Prices Will Fall

There is a clear, mathematical relationship between interest rates and bond prices. When interest rates go up, bond prices drop. The longer the maturity of the bond, the larger the drop. Governments, central banks, pension funds, commercial and investment banks, insurance companies, and so on are holding large quantities of bonds. When interest rates are low, even small, nominal increases translate to large percentage increases. A half percentage point increase from 6 to 6.5 percent is only 8 percent, but a half percentage point increase from 5 to 5.5 percent is a 10 percent increase. Could a rout in the bond markets weaken the balance sheets of financial companies and funds that previously just suffered through a period of low returns?

Effect Two: Exchange Rates Will Shift

Interest rates affect exchange rates, and not all central banks will seek to increase rates at a similar speed. For example, for cultural reasons, the Fed may increase rates more slowly than the ECB. If so, similar inflation rates could lead to a rise in the euro versus the USD. As of 2016, the Fed was quicker to influence rates upward than the ECB, though more for reasons of getting back to a "normal" monetary policy than to quell inflation. Central banks may hesitate to raise rates just to keep their economy's exchange rate down.

Effect Three: Asset Allocations Will Shift around the World

Inflation and interest rate differentials could set off significant portfolio reallocations across assets and economies. An overall increase in rates can send investors into more interest-bearing and fewer equity instruments. They will also move money to the places with the highest interest rates (allowing for risk differences). As rates rise on low-risk, interest-bearing instruments, investors may also keep shifting out of riskier instruments and locations, causing values to drop and risk premiums to
increase. In countries with under-controlled inflation where central banks hesitate to raise rates, investors tend to escape low or negative returns on cash and bonds by going into property and equities, or simply fleeing the currency. More anticipation of this scenario can cause it to happen.

Effect Four: Short-Term Borrowers Will Suffer More Than Longer-Term Borrowers

Interest rate increases drive down the values of longer-term interest-bearing assets. Those who borrowed in the short term to buy longer-term assets may find their cost of capital higher than their returns. That is a squeeze called a maturity mismatch. Short-term borrowing at 1/2 percent to buy a 10-year bond yielding 3 percent works, until the borrowing cost goes to 4 percent and the value of the bond drops 20 percent. Institutions with these mismatches can profit in the short term, but be decimated after rate increases. A maturity mismatch can be compounded by a currency mismatch.

These are possible effects based on past experiences and the way the system developed post-2008. After the great recession people got used to behaving as if interest rates never go up, or if they do, they will go up only a little. It is worth looking at the longer term, and what interest rates have actually done. Figure 3.3 shows long-term interest rates from 1790 to 2016. Clearly, there are other periods in history in which people thought that rates were stable and were going to stay that way. This time may be different, but history says it probably won’t be.

![Figure 3.3](image-url)  
*Figure 3.3. Long-Term Interest Rates, 1790 to 2016. Source: Data is from Hamilton Research LLC, 2016.*

NOTES

1. This is not as clear cut as many traditional “left” or “right” issues, though those on the right and libertarians tend not to believe that money supply should be actively managed and see strength in the rigidity of the gold standard.

2. Despite popular belief, individuals in the United States were not able to go to the Fed and get an ounce of gold for $35. However, other countries that held USD could. It was the aggressive selling of USD to the US Treasury for gold by France in the late 1960s (and the age-old nemesis of gold standards, a need to finance the Vietnam War) that led the United States to abandon gold as a basis for the dollar. See Eichengreen (2011) for a good summary of the program and the nuances involved, which are too extensive to get into here.

3. Hyperinflation is commonly defined as inflation of greater than 50 percent per month. Commonly, a loss of faith is passaged by monetary authorities rapidly increasing the money supply, but that need not be the case. Once enough people start to abandon a currency, its value can keep plummeting under its own steam.

4. Silk Road, one of the largest exchanges of illicit goods and services including drugs and contract killings, was closed by the FBI in late 2014. For the story of the capture of its alleged founder “Dread Pirate Roberts” and the subsequent trial see Greenberg 2015.

5. For an overview of virtual currencies, how they differ from national fiat currencies, and regulatory issues see the IMF report He et al. 2016.

6. For a summary, see these notes from the US Federal Reserve 2015 and the Federal Reserve Bank of New York 2008. Though these measures of money have historically been important in economics, they are increasingly not in open economies with free movement of capital, “shadow” banking, and credit systems.

7. A notable exception was US Fed Chairman Paul Volcker’s very politically unpopular decision to raise interest rates toward the 20 percent range in 1982 to put a stop to inflation. History now remembers this as one of the boldest and most correct moves in central banking. Cases also abound of revocation of independence when central banks don’t follow political rules, such as the Peruvian case under Alan Garcia in the 1990s.

8. The ownership structure of the Fed is a bit confusing, with the twelve banks in the Federal Reserve System in theory owned by the member commercial banks, Federal Reserve Bank, 2016.

9. These can vary a bit as they are stated. The Fed is mandated to achieve “maximum employment, stable prices, and moderate long-term interest rates,” Federal Reserve Bank 2016.

10. History is being made as this book is written, with the ECB implementing loose monetary policies that not long ago would have been unthinkable.

11. The actual owners of the bonds were mainly large institutional investors, hedge funds, sovereign wealth funds, mutual funds, and other large global money managers. They sold because at the offered price, they believed it would be more advantageous to change their portfolio composition than to continue to hold the bonds.

12. The rationale behind the experiments in the modern post-great recession world, of these and the unconventional lever to follow has been written about extensively elsewhere. See, for example, the narratives in Big Picture Economics, by Naroff and Scherler (2014) and any number of quality books about the great recession such as This Time Is Different by Reinhart and Rogoff (2009) and Crisis Economics by Nouriel Roubini (2010).

13. Such as in 2008 and 1907.
Chapter 3

14. This is contrary to the way money creation is normally described in textbooks, but it is correct. See Stadtmann and Poul's research paper, "Repeat after Me: Banks Cannot and Do Not "Lend Out" Reserves" by Paul Sheard (2014) and the exposition by Rochie (2011).


16. Remember the inverse relationship between bond price and interest rate.

17. Former Fed Chairman Ben Bernanke is renowned for saying that QE works in practice, but not in theory.

18. Solid evidence is lacking in many areas. See, for example, the case for emerging market asset price inflation by Lavigne et al. 2014. Some researchers suspect QE has led to wider asset price inflation by Lavigne et al. Some researchers suspect QE has led to wider asset price inflation by Lavigne et al. 2014. Some researchers suspect QE has led to wider asset price inflation by Lavigne et al. Some researchers suspect QE has led to wider asset price inflation by Lavigne et al. Some researchers suspect QE has led to wider asset price inflation by Lavigne et al.


20. See the BIS annual report, BIS 2014.

21. Some do advocate such interventions. The Modern Monetary Theory school and some mainstream economists such as Paul Krugman have questioned whether direct injections would be problematic when inflation is persistently low.

22. This could reach nearly half by 2017 according to Boulton and Nozawa (2015).

23. For a summary of issues, see S&P chief economist Paul Sheard’s (2016) article, "Heli-"Money and the Monetary Garden of Eden."

24. The concept of cheap versus easy money comes out in this study by Bailey and Redfern (2002) of the effect of interest rate on housing. Low rates affect housing starts in the short run, but not homeownership. Developers react to low rates to expand the supply, but low rates alone do not get individuals to buy homes.


26. Economically, the USD did increase sharply in value as the discrepancy between deflationary Europe and a growing United States became increasingly evident.

27. This led to claims of a much-publicized "currency war" in Brazil as authorities there worked in 2010 to counteract the accretive effects of financial inflows on their exchange rate. After the "repeal," Brazil’s currency dropped and the ministry of finance struggled with curbing inflation and the higher cost of dollar-denominated sovereign debt.

28. Like most events in the global economy, there were likely multiple causal factors. For some of the countries in the chart, weakening growth and softening global commodity prices were likely a parallel driver of the drops. Short sellers, anticipating drops, can also then put downward pressure on a currency.


30. The event was widely reported in the financial press. See for example The Economist 2016.

31. I have been warned by a respected reader of this manuscript about predicting crises and will not claim to do that. However, the sorts of more moderate, but still considerable, shifts and flows of FM currency values are likely to continue due to the dynamics discussed here throughout the book.

32. It has been difficult to precisely ascertain how QE affected prices in different asset markets. On longer-term highly rated bonds it was probably significant, as that was the purpose of QE. On domestic stocks, it is harder to say since increases in stock values also coincided with increase corporate profitability. In emerging markets, again there is some evidence, but not definitive. The reports cited offer various viewpoints. See Prasschaier et al. 2013, Barro et al. 2016, the IMF report by Roache and Roosen, and the McKinsey report by Dobbs et al. 2013.

33. Though inflation is a key economic statistic in policy decision-making, it also serves as a case of the ambiguity inherent in economic data. The basket used in the United States is reconfigured every seven or so years, so it probably does not reflect almost anyone’s actual consumption patterns. More importantly, inflation is not really an economy-wide number, but affects regions and people quite individually. Yet even minor changes in the reported rate are regularly watched, commented on, and acted on.

34. Even though unemployment dropped, for a number of reasons wages did not increase as much as they had historically. It's an example of why hard-and-fast rules, even related to supply and demand, need to be looked at carefully in each case rather than blindly followed.

35. For a summary of the mechanisms of affecting real interest rates, see the BIS report by Behn and Mankowiz 2016. For a country like Greece with price levels that are probably too high for the country to be competitive on global markets, deflation, though painful, is the main short-term mechanism for regaining competitiveness.

36. Central banks tend to treat even moderate inflation as more of a problem than it might actually be. Economist Robert Barro (2013) noted a negative relationship between inflation and growth, but results were only statistically significant when cases of greater than 20 percent per year inflation were included.

37. There is sometimes confusion here. If you hold a bond to maturity, you get the full return you signed up for. But if you try to sell it in the secondary market after rates go up, its value will be lower than before. Interest rates went up.

38. "Other things" include weaknesses in the currency periphery, changes in attitude/ orientation at the ECB, demographic shifts from aging, and low productivity growth.