

CHAPTER 1

How Credit Slipped Its Leash

Irredeemable paper money has almost invariably proved a curse to the country employing it.

—Irving Fisher¹

Credit-induced boom and bust cycles are not new. What makes this one so extraordinary is the magnitude of the credit expansion that fed it. Throughout most of the twentieth century, two important constraints limited how much credit could be created in the United States. The legal requirement that the Federal Reserve hold gold to back the paper currency it issued was the first. The legal requirement that commercial banks hold liquidity reserves to back their deposits was the second. This chapter describes how those constraints were removed, allowing credit to expand to an extent that economists of earlier generations would have found inconceivable.

Opening Pandora's Box

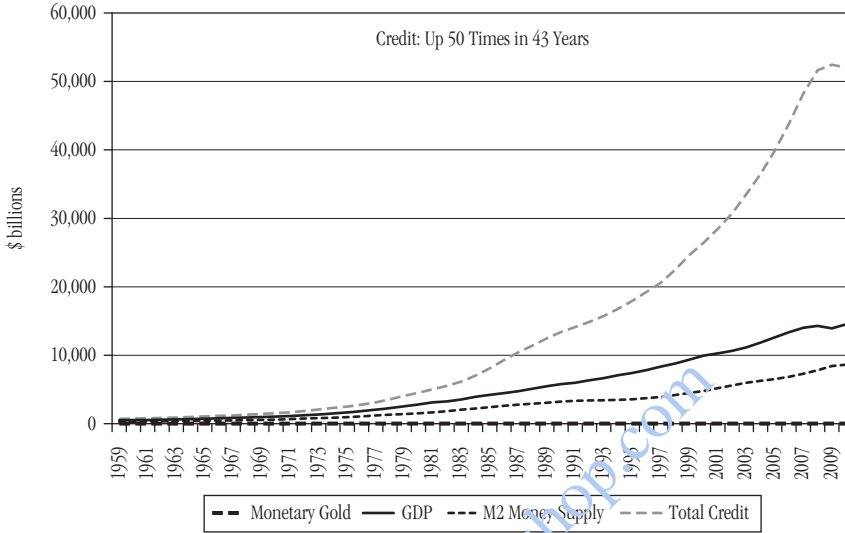
In February 1968, President Lyndon Johnson asked Congress to end the requirement that dollars be backed by gold. He said:

The gold reserve requirement against Federal Reserve notes is not needed to tell us what prudent monetary policy should be—that myth was destroyed long ago.

It is not needed to give value to the dollar—that value derives from our productive economy.²

The following month Congress complied.

EXHIBIT 1.1 Money, Credit, and GDP



Source: Federal Reserve

That decision fundamentally altered the nature of money in the United States and permitted an unprecedented proliferation of credit. Exhibit 1.1 dramatically illustrates what has occurred.

The monetary gold line at the bottom of the chart represents the gold held within the banking system. It peaked at \$19 billion in 1959 and afterward contracted to \$10 billion by 1971. M2 represents the money supply as defined as currency held by the public, bank liquidity reserves, and deposits at commercial banks. The top line represents total credit in the country.

It is immediately apparent that credit expanded dramatically both in absolute terms and relative to gold in the banking system and to the money supply. In 1968, the ratio of credit to gold was 128 times and the ratio of credit to the money supply was 2.4 times. By 2007, those ratios had expanded to more than 4,000 times and 6.6 times, respectively. Notice, also, the extraordinary expansion of the ratio of credit to GDP. In 1968, credit exceeded GDP by 1.5 times. In 2007, the amount of credit in the economy had grown to 3.4 times total economic output.

Total credit in the United States surpassed \$1 trillion for the first time in 1964. Over the following 43 years, it increased 50 times to \$50 trillion in 2007. That explosion of credit changed the world.

Constraints on the Fed and on Paper Money Creation

The Federal Reserve Act of 1913 created the Federal Reserve System and gave it the power to issue Federal Reserve Notes (i.e., paper currency). However, that Act required the Fed to hold “reserves in gold of not less than forty per centum against its Federal Reserve notes in actual circulation.”³ In other words, the central bank was required to hold 40 cents worth of gold for each paper dollar it issued. In 1945, Congress reduced that ratio from 40 percent to 25 percent.

So much gold had flowed into U.S. banks during the second half of the 1930s as the result of political instability in Europe that the Federal Reserve had no difficulty meeting the required ratio of gold to currency for decades. In fact, in 1949, it held nearly enough gold to fully back every Federal Reserve note in circulation.

During the 1950s and 1960s, however, the amount of gold held by the Fed declined. From a peak of \$24.4 billion in 1949, the Fed’s gold holdings fell to \$19.4 billion in 1959 and to only \$10.3 billion in 1968. Moreover, not only was the gold stock contracting, the currency in circulation was increasing at a significantly faster pace. During the 1950s, currency in circulation grew at an average rate of 1.5 percent a year, but by an average of 4.7 percent a year during the 1960s.

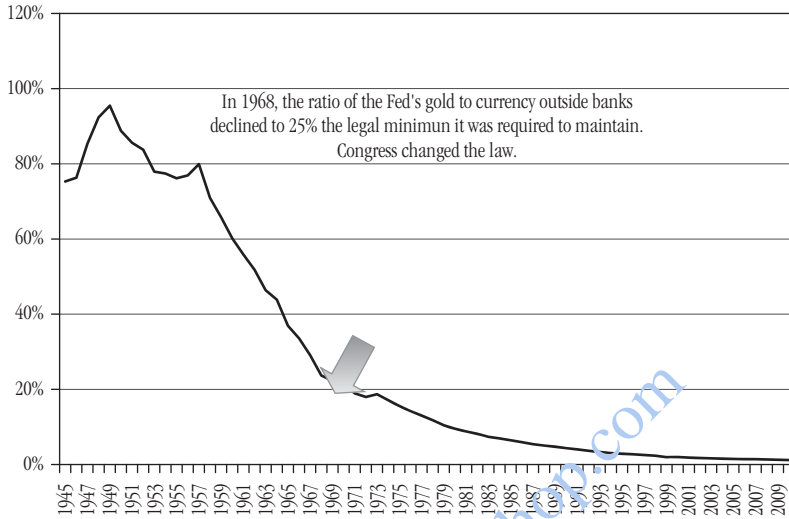
In 1968, the ratio of the Fed’s gold to currency in circulation declined to 25 percent (as shown in Exhibit 1.2) the level it was required to maintain by law. At that point, Congress, at the urging of President Johnson, removed that binding constraint entirely with the passage of the Gold Reserve Requirement Elimination Act of 1968. Afterward, the Fed was no longer required to hold any gold to back its Federal Reserve notes. Had the law not changed, either the Fed would have had to stop issuing new paper currency or else it would have had to acquire more gold.

Once dollars were no longer backed by gold, the nature of money changed. The worth of the currency in circulation was no longer derived from a real asset with intrinsic value. In other words, it was no longer commodity money. It had become fiat money—that is, it was money only because the government said it was money. There was no constraint on how much money of this kind the government could create. And, in the years that followed, the fiat money supply exploded.

Between 1968 and 2010, the Fed increased the number of these paper dollars in circulation by 20 times by printing \$886 billion worth of new Federal Reserve notes. (See Exhibit 1.3.) (Its gold holdings now amount to the equivalent of 1 percent of the Federal Reserve notes in circulation.)

Although this new paper money was no longer backed by gold (or by anything at all), it still served as the foundation upon which new credit could be created by the banking system. Fifty trillion dollars worth of credit could not have been erected on the 1968 base of 44 billion gold-backed dollars.

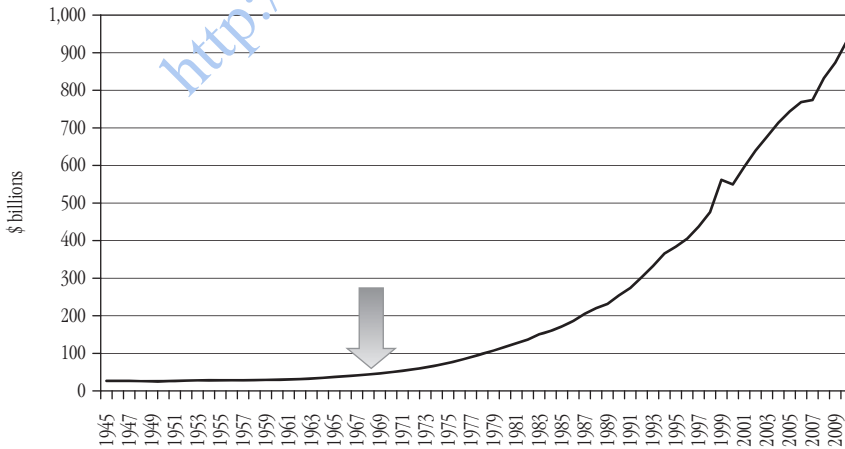
EXHIBIT 1.2 The Ratio of the Fed's Gold Holdings to Currency Outside Banks



Source: Federal Reserve, Flow of Funds

EXHIBIT 1.3 Currency Outside Banks

Between 1968 and June 2010, the Fed issued an additional \$886 billion in currency, 20 times the amount that had been in issue in 1968.



Source: Federal Reserve, Flow of Funds

Fractional Reserve Banking Run Amok

The other constraint on credit creation at the time the Federal Reserve was established was the requirement that banks hold reserves to ensure they would have sufficient liquidity to repay their customers' deposits on demand. The Federal Reserve Act specified that banks must hold such reserves either in their own vaults or else as deposits at the Federal Reserve.

The global economic crisis came about because, over time, regulators lowered the amount of reserves the financial system was required to hold until they were so small that they provided next to no constraint on the amount of credit the system could create. The money multiplier expanded toward infinity. A proliferation of credit created an economic boom that transformed not only the size and composition of the U.S. economy but also the size and composition of the global economy. The collapse came when the borrowers became too heavily indebted to repay what they had borrowed.

By 2007, the reserves ratio of the financial system as a whole had become so small that the amount of credit that the system created was far beyond anything the world had experienced before. By the turn of the century, the reserve requirement played practically no role whatsoever in constraining credit creation. This came about due to two changes in the regulation of the financial industry. The first was a reduction of the amount of reserves that banks were required to hold. The second was regulatory approval that allowed new types of creditors to enter the industry with little to no mandatory reserve requirements whatsoever. The following pages describe this evolution of the U.S. financial industry.

In order to understand how reserve requirements limited credit creation, it is first necessary to understand how credit is created through Fractional Reserve Banking.

Fractional Reserve Banking

Most banks around the world accept deposits, set aside a part of those deposits as reserves, and lend out the rest. Banks hold reserves to ensure they have sufficient funds available to repay their customers' deposits upon demand. To fail to do so could result in a bank run and possibly the failure of the bank. In some countries, banks are legally bound to hold such reserves, while in others they are not. A banking system in which banks do not maintain 100 percent reserves for their deposits is known as a system of *fractional reserve banking*. In such a system, by lending a multiple of the reserves they keep on hand, banks are said to create deposits.

The following example illustrates how the process of deposit creation occurs. In this example, it is assumed that the country in which the banking system operates is on a gold standard, and that banks in that country are required to hold a level of gold reserves equivalent to 20 percent of their deposits.

The process begins when Bank A accepts a deposit of \$100 worth of gold. To meet the 20 percent reserve requirement, it sets aside \$20 in gold as reserves. It then lends out the remaining \$80. The recipient of the loan deposits the \$80 into his bank, Bank B. Bank B sets aside 20 percent of the \$80, or \$16 worth of gold, as reserves. It lends out \$64, which ends up in Bank C. This process occurs again and again (see Exhibit 1.4). Therefore, an initial deposit of \$100 worth of gold, through the magic of fractional reserve banking, eventually leaves the banking system with \$500 of deposits and \$400 of credit, while an amount equivalent to the initial deposit is set aside as \$100 worth of reserves. The balance sheet of the banking sector would show assets of \$500, made up of \$400 in loans plus \$100 in reserves; and it would show liabilities of \$500 made up entirely of deposits.

EXHIBIT 1.4 "Money Creation" through Fractional Reserve Banking

Assuming:

An initial deposit of \$100 of gold

A Reserve Ratio of 20%

	Deposits	Reserves	Loans
Round 1	100	20	80
Round 2	80	16	64
Round 3	64	13	51
Round 4	51	10	41
Round 5	41	8	33
Round 6	33	7	26
Round 7	26	5	21
Round 8	21	4	17
Round 9	17	3	13
Round 10	13	3	11
Round 11	11	2	9
Round 12	9	2	7
Round 30	0.2	0.0	0.1
Round 31	0.1	0.0	0.1
Total	500	100	400

In the real world, there are a number of other factors that would have to be taken into consideration. Nevertheless, this simplified example is sufficient to demonstrate the process of deposit creation.

There are two important points to grasp here. First, fractional reserve banking creates credit as well deposits. In the previous example, \$400 worth of credit was created by the banking system. Second, the reserve ratio is the factor that determines the maximum amount of deposits (and credit) that can be created. In this example, at the end of the process, there are \$500 of deposits, or five times the amount of gold initially deposited, and \$400 of credit that did not exist before. The inverse of the reserve requirement is known as the *money multiplier*. Here, the money multiplier is 1/20 percent or 5 times. If the reserve requirement had been 10 percent, the banking system would have ended up with \$1,000 of deposits, or 10 times the amount of gold initially deposited, and \$900 of new credit. In that case the money multiplier would be 10.

Now consider the reduction of the reserve requirements of the commercial banks.

Commercial Banks

Commercial banking was a straightforward business after the passage of the Glass–Steagall Act separated commercial banking from investment banking in 1933. Banks took deposits and used them to make loans; and the banks were required to hold reserves with the central bank to ensure they would have sufficient liquidity to repay deposits to their customers upon demand. In 1945, deposits supplied 98 percent of the banks' funding. The legal reserve requirement was 20 percent for demand deposits (which accounted for 76 percent of funding) and 6 percent for time deposits (22 percent of funding). Those reserve requirements could be met by a combination of cash held in the banks' vaults and reserves deposited with the central bank.⁴ (Note: The Reserve requirement on demand deposits for country banks was lower, 14 percent.)

Over time, banks began to rely more heavily on time deposits, which required fewer reserves. By 2007, demand deposits amounted to only 6 percent of commercial banks' funding. Time deposits had increased to 57 percent of funding. This alone significantly reduced the amount of money that banks had to keep as reserves. In addition to accepting deposits, the banks had begun to raise funds by selling commercial paper and bonds, as well as by borrowing in the repo market. In 2007, 12 percent of the banks' funding came from issuing credit market instruments, 8 percent from the repo market, and 17 percent from *miscellaneous*

liabilities. They were not required to set aside any reserves against those types of liabilities.

Furthermore, over the decades, the Fed had also repeatedly lowered the amount of reserves that banks were required to hold against both demand and time deposits. Currently, reserve requirements are set out as follows:

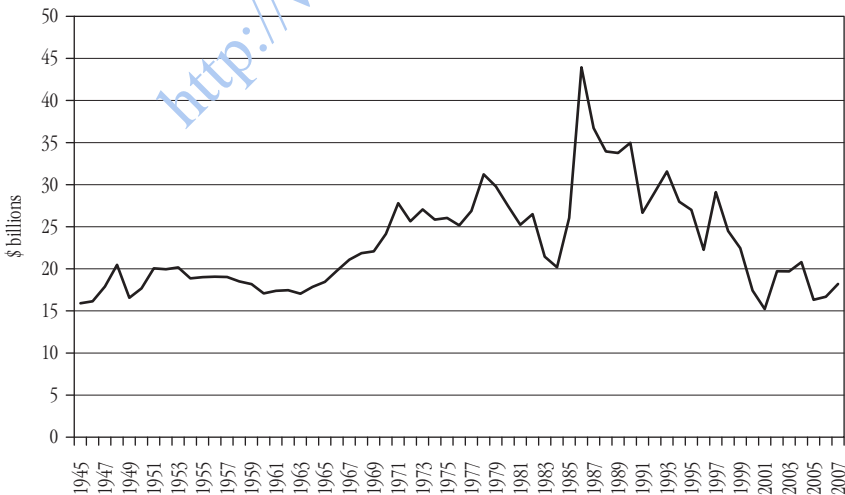
- For net transactions accounts of less than \$10.7 million, 0 percent
- For those between \$10.7 and \$58.8 million, 3 percent
- For those greater than \$58.8 million, 10 percent

No reserves are required for nonpersonal time deposits.⁵ Combined, these developments left the banks with a level of reserves so small as to be practically meaningless when the crisis of 2008 occurred.

In 1945, commercial banks had held reserves and vault cash of \$17.8 billion, the equivalent of 12 percent of their total assets, at a time when 64 percent of their assets were (very low risk) U.S. government bonds. By 2007, the banks' reserves and vault cash had tripled to \$73.2 billion, but their assets had increased by 82 times to \$11.9 trillion. That put the liquidity ratio at 0.6 percent.

The amount of reserves the banks held at the Fed was only \$2 billion larger in 2007 than it had been in 1945, and almost all the increase in vault cash resulted from the cash held in the "vaults" of the banks' automatic teller machines. (See Exhibit 1.5.)

EXHIBIT 1.5 Commercial Bank's Reserves at the Federal Reserve, 1945 to 2007

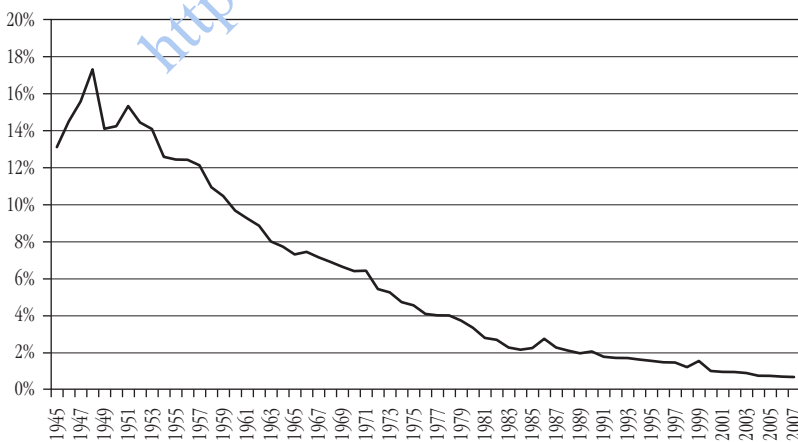


Source: Federal Reserve, Flow of Funds

Beginning in 1988, banks were required to maintain a *capital adequacy ratio* (CAR) of 8 percent. The “capital” supplying the banks’ capital adequacy was not a pool of liquid assets, however. It was essentially just a bookkeeping entry representing the difference between the banks’ assets and liabilities. The capital was put to work by the banks, either being extended as loans or else invested in credit instruments. Since the capital could be used to make loans, it did not constrain credit creation the way liquidity reserves (held as physical cash or separated and held on deposit at the central bank) had done. Moreover, as described next, although the quantity of the industry’s capital increased over time, the quality of that capital deteriorated sharply.

The Fed justified reducing the banks’ reserves requirements on the grounds that they were no longer necessary because the Fed itself would always be able to provide liquidity support to any bank that required short-term funding. Clearly, the Fed did not understand the consequences of its actions. By reducing the banks’ reserve requirements, the Fed enabled the commercial banks to create much more credit than otherwise would have been possible. The ratio of commercial bank assets to reserves and vault cash exploded from 8 times in 1945 to 162 times in 2007. Conversely, the ratio of their reserves and vault cash to liabilities plummeted. (See Exhibit 1.6.) In the end, when the crisis came, the Fed did provide the banks with the liquidity they required. But to do so, it had to create \$1.7 trillion of new fiat money, an amount equivalent to 12 percent of the U.S. GDP. That rescue operation became known as *quantitative easing, round one* (QE1). It will be described in greater detail in Chapter 5.

EXHIBIT 1.6 Commercial Banks’ Vault Cash and Reserves to Total Liabilities, 1945 to 2007



Source: Federal Reserve, Flow of Funds

The Broader Credit Market: Too Many Lenders, Not Enough Reserves

As the reserve requirements of the commercial banks fell and the money multiplier expanded, credit creation through fractional reserve banking exploded. But that is only part of the story. Starting in the 1970s, the structure of the financial system in the United States changed radically. Many new types of credit providers emerged, and, in most cases, the new lending institutions were not subject to any reserve requirements whatsoever.

Exhibit 1.7 provides a snapshot of the country's credit structure in 1945 and in 2007.

At the end of World War II, the credit structure of the United States was simple and straightforward. It became vastly more complicated and leveraged, however, as time went by and new kinds of financial entities were permitted to extend credit.

In 1945, the household sector supplied 26 percent of the country's credit. Households had invested heavily in government bonds during the war.

The financial sector supplied 64 percent of all credit. At that time, commercial banks dominated the financial industry, providing 33 percent of all the credit in the country. Life insurance companies supplied 12 percent of total credit, and other savings institutions, such as thrifts and savings & loan companies, accounted for a further 7 percent. These three sets of financial

EXHIBIT 1.7 Total Credit Market Debt Held by the Creditors

	1945	2007
Total \$ billions	\$355	\$50,043
Household Sector	26%	8%
Financial Sector	64%	73%
including:		
Commercial banks	33%	18%
Life insurance companies	12%	6%
Savings institutions	7%	3%
GSEs & GSE-backed mortgages	1%	15%
Issuers of asset-backed securities	0%	9%
Money market funds	0%	4%
Mutual funds	0%	4%
Others financial sector	11%	14%
Rest of the World	1%	15%
Miscellaneous	9%	4%
	100%	100%

Source: Federal Reserve, Flow of Funds

institutions were all tightly regulated by the government in a way that ensured their risks were limited and their liquidity was ample.

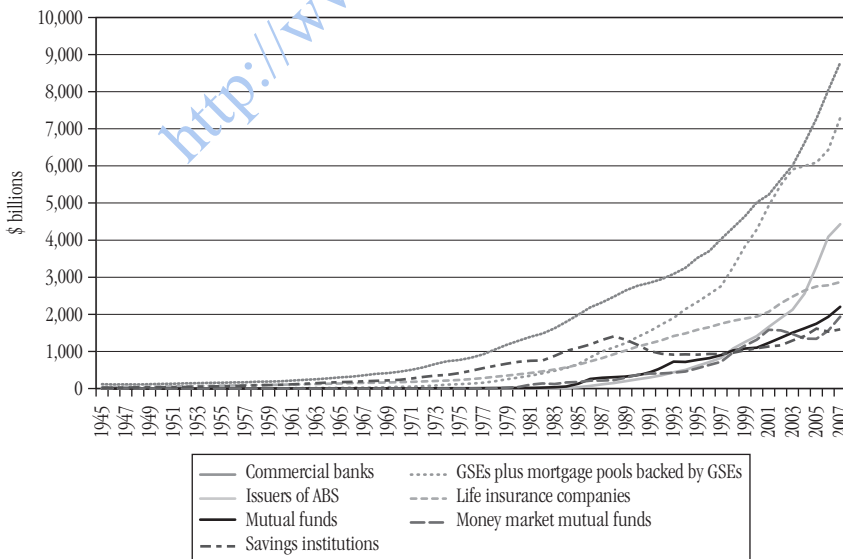
By 2007, the relative importance of each of those three groups had been roughly cut in half. Of all the credit supplied in the country, commercial banks provided 18 percent, life insurance companies provided 6 percent, and the savings institutions provided 3 percent. New financial institutions had emerged as important creditors, and they had eroded the market share of the traditional lenders.

Fannie Mae, Freddie Mac, and other government-sponsored enterprises (GSEs) began growing aggressively during the 1980s. Their mission was to make housing more affordable. To accomplish that mission, those government-backed entities issued debt and used the proceeds to buy mortgage loans from banks and other mortgage originators, who then had the resources to extend more mortgages.

By 1985, the GSEs overtook life insurance companies as the third largest credit provider within the financial sector. Five years later, they moved into second place, overtaking the savings institutions. In 2002, they came very close to overtaking commercial banks as well. In other words, they came very close to being the largest suppliers of credit in the United States. (See Exhibit 1.8.)

Issuers of *asset-backed securities* (ABSs) also became major credit providers. ABS issuers acquired funding by selling bonds. They used the

EXHIBIT 1.8 The Suppliers of Credit from the Financial Sector



Source: Federal Reserve, Flow of Funds

proceeds to buy mortgage loans, credit card loans, student loans, and some other credit instruments, which they then bundled together in a variety of ways and sold to investors as investment vehicles with different degrees of credit risk. They were not significant players in the credit markets until the second half of the 1980s. By 2007, however, ABS issuers supplied 12 percent of the credit provided by the financial sector or 9 percent of all credit outstanding.

Mutual funds and money market funds had also come of age during the 1980s, and by 2007, they provided 6 percent and 5 percent, respectively, of all credit supplied by the financial sector.

Credit without Reserves

By 2007, the GSEs and the issuers of ABSs provided 24 percent of all the credit in the country. Their rise made the financial system much more leveraged and complex than when it had been dominated by the commercial banks. First of all, the GSEs and ABS issuers faced much lower capital adequacy requirements than the traditional lenders. Banks and savings institutions were required to maintain capital equivalent to 8 percent of their assets—in other words, a CAR of 8 percent. Life insurance companies were also tightly regulated and made to keep large capital reserves. Fannie and Freddie, however, were required to hold only 2.5 percent capital against the mortgage loans held on their books and only 0.45 percent for the mortgages they had guaranteed. Fannie, for example, in 2007 had assets (mortgages and guarantees) valued at \$2.9 trillion, but shareholders' funds (capital) of only \$44 billion. Therefore, Fannie's CAR (equity to assets) was only 1.5 percent. Freddie's was even less, 1.3 percent that year.

The case of the ABS issuers was similar. Generally, the issuers of ABSs were special purpose vehicles (SPVs) that had been created for the purpose of packaging and selling loans that had been originated by commercial banks, investments banks, or corporations such as General Electric and Chrysler. Moving assets into the SPVs reduced the amount of capital the loan originators were required to hold, even though quite often the originators remained the beneficial owners of the SPVs. For example, holding mortgage-backed securities with AAA or AA ratings required only 1.6 percent capital backing. And, generally, the credit rating agencies were happy to provide such a rating—for a fee. Therefore, ABS issuers held much lower CARs than the banks did.

More importantly, the GSEs and ABS issuers faced no liquidity reserve requirements at all. They raised funding by issuing debt and, in the process of issuing debt, they created credit. Fannie Mae and Freddie Mac alone

owned nearly \$5 trillion in mortgage assets at the end of 2007. They had funded the purchases of those mortgages by issuing roughly \$5 trillion in Fannie and Freddie bonds, an amount equivalent in size to 10 percent of the entire credit market.

Just as commercial banks created credit by making loans (through the system of fractional reserves banking), the GSEs and ABS issuers also created credit by extending credit—but with even less constraint because they were not required to hold any liquidity reserves. Rather than remaining a system of fractional reserve banking, the financial system of the United States had evolved into one entirely unconstrained by reserve requirements. Consequently, there was no limit as to how much credit that system could create.

The events of 2008 brutally revealed the gross inadequacy of the financial system's capital and liquidity.

The Flow of Funds

The Fed's Flow of Funds Accounts provides a near-comprehensive set of information about the stock and flow of credit in the United States. Because credit growth now drives economic growth, the flow of funds is the key to understanding developments in the U.S. economy.

The *Flow of Funds Accounts of the United States* is published by the Federal Reserve on its website each quarter at www.federalreserve.gov/releases/z1/Current/z1.pdf.

Credit and debt are two sides of the same coin. One person's debt is another person's asset. As of June 30, 2011, the total size of the U.S. credit market was \$52.6 trillion. Throughout this book, this figure is referred to as *total credit market debt*, or TCMD.

Table L.1 of the *Flow of Funds* report, titled Credit Market Debt Outstanding, is the summary table of TCMD. It provides a breakdown by sector of (1) who owes the debt, "Total credit market debt owed by" and (2) to whom the debt is owed, "Total credit market assets held by."

The top half of Table L.1, the breakdown of who owes the debt, has been provided as Exhibit 1.9. There are three major categories:

1. The domestic nonfinancial sectors
2. The rest of the world
3. The financial sectors

Note: Detailed information on each of these categories, as well as details concerning who owns the debt, can be found in the other 144 tables spread across the *Flow of Funds Accounts of the United States*. All

EXHIBIT 1.9 Credit Market Debt Outstanding

L.1 Credit Market Debt Outstanding

Billions of dollars

	2006	2007	2008	2009	2010
1 Total Credit Market	45,354	50,043	52,433	52,266	52,399
Debt Owed by:					
2 Domestic nonfinancial sectors	29,180	31,699	33,602	34,634	36,113
3 Household sector	12,943	13,806	13,844	13,611	13,386
4 Nonfarm corporate business	5,943	6,703	6,951	6,964	7,176
5 Nonfarm noncorporate business	3,196	3,650	3,972	3,672	3,475
6 Farm business	204	219	223	221	225
7 State and local governments	2,008	2,199	2,251	2,360	2,465
8 Federal government	4,885	5,122	6,362	7,805	9,386
9 Rest of the world	1,883	2,126	1,709	2,014	2,115
10 Financial sectors	14,291	16,217	17,123	15,618	14,171
11 Commercial banking	1,002	1,263	1,425	1,666	1,852
12 U.S.-chartered commercial banks	498	630	709	576	805
13 Foreign banking offices in the U.S.	0	1	0	0	0
14 Bank holding companies	503	633	717	1,090	1,047
15 Savings institutions	319	423	356	152	127
16 Credit unions	19	32	41	27	26
17 Life insurance companies	14	29	55	48	45
18 Government-sponsored enterprises	2,628	2,910	3,182	2,707	6,435
19 Agency- and GSE-backed mortgage pools	3,841	4,464	4,961	5,377	1,139
20 ABS issuers	4,199	4,544	4,135	3,350	2,353
21 Finance companies	1,144	1,280	1,200	1,044	962
22 REITs	411	421	373	339	350
23 Brokers and dealers	69	65	143	93	130
24 Funding corporations	645	786	1,253	817	751

Source: Federal Reserve Flow of Funds

the data series can be easily downloaded from 1945. Much of the analysis in this book is built on the data supplied in the *Flow of Funds* report.

The Rest of the World

The third development responsible for the credit conflagration in the United States originated outside the country. As can be seen in Exhibit 1.7, lenders from “the rest of the world” supplied 15 percent of all credit within the United States by 2007, a figure that came to roughly \$7 trillion that year.

It is crucial to understand that this money, which was lent to the United States, originated on the printing presses of Asian central banks. It was newly created fiat money and a requisite part of Asia’s export-led growth model. More than any other single factor, it was responsible for creating the global imbalances that destabilized the world.

Chapter 2 details how the creation of the equivalent of nearly \$7 trillion in fiat money outside the United States between 1971 and 2007 exacerbated the extraordinary credit dynamic already underway inside the United States.

Notes

1. Irving Fisher, *The Purchasing Power of Money: Its Determination and Relation to Credit, Interest and Crises* (New York: The Macmillan Company, 1912), p. 131.
2. Council of Economic Advisers, 1968 Economic Report of the President, p. 16, http://fraser.stlouisfed.org/publications/ERP/issue/1162/download/5727/ERP_1968.pdf.
3. The Federal Reserve Act of 1913, p. 17, http://en.wikisource.org/wiki/Federal_Reserve_Act.
4. Joshua N. Feinman, “Reserve Requirements: History, Current Practice, and Potential Reform,” Federal Reserve Bulletin, June 1993.
5. The Fed’s website: Reserve Requirements, <http://www.federalreserve.gov/monetarypolicy/reservereq.htm>.

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