

## Answers to Questions: Chapter 5

1. Figure 5-1 on page 123 shows that the output gaps fell by about the same amounts in Japan and Europe as it did in the United States from 2007-09. This is evidence that the magnitude of the downturn economic was not confined to the United States, which justifies the use of the term “global” to describe the crisis that occurred at the end of the last decade. Also Figure 5-1 shows that all three regions are sharing in the slow recovery from the 2007-09 drop in output, which reinforces the global nature of the economic crisis.
2. Figure 5-2 on page 124 shows that while the output gaps dropped by similar amounts during the 1981-85 period and the 2007-09 recession, the economic downturn lasted two quarters longer in the recent recession when compared to the earlier one. Figure 5.3 on page 125 shows that the employment gap fell much more during the recent recession when compared to the earlier recession.

Figure 5.2 shows that the rebound of output was much larger following the end of the recession during 1981-85 than it has been following the 2007-09 recession. The sharp rebound in output during the earlier period resulted in a quick rise in the unemployment gap as well, whereas there has been only a slight increase in the unemployment gap following the end of the recent recession. Furthermore most forecasts are that the unemployment gap will remain negative until at least 2015.

3. A bank's assets are what it owns; they consist mainly of the loans that it makes, the financial investments it has in government and private securities, and the reserves it has in cash or in an account with the Fed. A bank's liabilities are what it owes, mainly to its depositors. The risk that a bank faces is that people may fail to repay loans or that a financial investment that it has made will not bring the expected return. A bank's equity, the difference between its assets and its liabilities, provides a margin between the bank's assets and liabilities. It therefore provides the bank with some ability to cover its liabilities in the event that there is a decline in the value of assets if loans go bad or financial investments decline in value.
4. Leverage is the ratio of a financial institution's liabilities to its equity. A bank can earn large profits per dollar of equity by making loans or financial investments that rise in value. The reason is that when the value of its financial investments increase by some amount, equity rises by the same amount since the value of its liabilities do not change. But the reverse holds as well and if the value of its assets falls, due to either bad loans or bad financial investments, by an amount that exceeds the bank's equity, then the bank becomes insolvent.

5. A nonbank financial institution does not have any reserves as part of its assets since it is not regulated by the Fed or any other government agency. This type of financial institutions gets funds to acquire assets by borrowing as opposed to accepting deposits. Finally, nonbank financial institutions tend to have less equity than banks and therefore are more highly leveraged than banks.
6. An asset bubble is a sustained large increase in the price of an asset relative to its fundamental value, followed by a collapse in price that eliminates most or all of the initial price gain. An asset bubble starts with an external shock that alters the perceived profitability of owning the asset. The expectations of a higher future price drives up the asset's price now. Furthermore the expectation of a higher future price entices potential buyers to borrow now in anticipation that the higher price in the future will enable them to easily pay off their loans. Therefore the development of a price bubble requires a ready supply of credit and purchases of the asset are often highly leveraged. Finally, some bubbles develop in part because financial innovations create new investments that seem to promise higher returns than they eventually deliver.
7. The stock market and commercial real estate bubble of the late 1920s and the 2000–06 housing bubble were fueled by highly leveraged purchases of assets. Both involved a greater deal of investor speculation as exemplified by construction of office buildings in the late 1920s that lacked tenants and mortgages in the 2000–06 period that required little or no down payment. Both bubbles resulted in large profits for investment bankers and consumption expenditures fueled by the increases in real wealth generated by the bubbles. Financial innovations included the development of mortgage backed securities in the earlier period and the wider use of these instruments in the first decade of the twenty-first century. In each case, buyers of these securities were often ignorant of the risks involved in owned these securities.

However, there were important differences between the two periods. Deposit insurance did not exist prior to 1933 which meant that depositors lost the funds they had in banks that failed as a result of the collapse of the bubbles in the earlier period. Second, the Fed was indifferent to the collapse of banks from 1930 to 1932, whereas it acted quite aggressively in an attempt to limit the fallout of the collapse of the housing bubble.

8. Banks sell mortgages to a large financial institution. The financial institution then issues a debt instrument similar to a bond. The principal and the interest of these debt instruments are to be paid out of the proceeds from the mortgages that the financial institution owns, which is why the debt instruments are called mortgage-backed securities. The subprime mortgage market consists of high-risk borrowers who typically have some combination of low incomes, unstable employment and/or credit histories.

Once banks started selling mortgages to larger financial institutions, the banks paid less attention to the ability of borrowers to repay the loans since those loans were no longer part of the banks' assets. Furthermore the buyers of the mortgage-backed securities thought they were making relatively safe investments, given that the securities had received high ratings from credit agencies. Similarly, the development of the subprime mortgage market meant that less credit-worthy borrowers had the opportunity to borrow. Finally, low interest between 2001 and 2004 meant that less credit-worthy borrowers would be able to afford the mortgages as long as interest rates stayed low. All three of these factors contributed to additional demand for housing and the expectation that house prices would continue to rise. However, once interest rates started to rise, fewer people could afford mortgages, which slowed the rise in the demand for housing and therefore the rise in house prices. Furthermore some loans came with adjustable interest rates. As a result, some people found they could no longer afford the mortgages they had taken out a couple of years earlier. Finally, as the rise in house prices slowed, some speculative investors in the housing market switched from being buyers to sellers in an effort to recoup their investments before price fell. That resulted in less demand and more supply than otherwise. These factors all contributed to a fall of housing prices.

Once housing prices started to fall and people started to default on their mortgages, then sellers of mortgage-backed securities were less able to pay the returns promised when the securities were issued. That caused a decline in the value of the securities and resulted in some buyers and sellers of the securities becoming insolvent as the down side of leveraging raised its head.

9. The term premium is the average difference between the long-term interest rates, such as on a Treasury bond, and the short-term interest rates, such as the federal funds rate or the interest rate on a Treasury bill. The risk premium is the difference between interest rates on securities of the same maturity but with different degrees of risk, such as difference between a riskier corporate bond and a safer Treasury bond. The term and risk premiums cause the cost of borrowing by households to be different from the federal funds rate for two reasons. First, short-term loans by banks to households and businesses, for say, household credit card purchases or to finance the short-term operations of a business, are riskier than overnight loans between banks, which is what the federal funds rate covers. Therefore there is a risk premium on even short-term loans, as well as on a long-term loan to a household or a business. Second, there is a term premium associated with a long-term loan to a household or business, such as a mortgage or when a corporation sells a bond.

10. The Federal Reserve System's assets are primarily the government and private sector securities that it owns. Its liabilities are the currency it has issued and the reserves banks hold.

Quantitative easing is when the Fed buys assets not to drive down the federal funds rate, which is already zero, but to raise bank reserves and to support the markets in the government and private securities the Fed chooses to buy. When the Fed buys long-term securities, that added demand drives up the prices of the securities, which reduces the yields on them and therefore the long-term premium. Similarly, a purchase of riskier securities by the Fed increases their prices and reduces their yields, thereby driving down the risk premium.

The evidence of quantitative easing following the financial crisis of the fall of 2008 is shown in the upper frame of Figure 5-12 on page 150. Initially, the Fed bought private assets other than mortgage-backed securities. Over the course of 2009-10, the Fed scaled back its holding of those assets, replacing them with mortgage-backed securities and government securities, without much of a change in its total assets between the end of 2008 and 2010.

11. Two things were primarily responsible for turning the crisis in the relatively small subprime mortgage market in the United States into the Global Economic Crisis. The first was the sharp rise of almost four percentage points in the risk premium from the beginning of 2007 through the end of 2008, with the sharpest jump after September 2008. That rise raised the cost of finance for all firms, causing them to cut costs in other ways such as laying off workers, reducing inventories, and even stopping construction on half-finished buildings. The rise in the risk premium also caused providers of short-term uninsured loans to closely monitor their borrowers and restrict lending. Declining asset values also raised concern about their fundamental values, which increased uncertainty and made lenders even more reluctant to make loans.

The second thing that turned the subprime mortgage crisis into a global event was that many banks in Europe and Japan had made investments in other regions of the world, including U.S. subprime mortgage-backed securities. These banks stopped lending to borrowers they thought to be at risk when the U.S. subprime mortgage-backed securities declined in value. Furthermore, banks had often paid for those securities taking out short-term dollar-denominated loans. Frozen credit markets in the United States after mid-September 2008 created a shortage of dollars, making it difficult for banks to renew their loans, which added to the insolvency problem and made the crisis spread beyond the shores of the United States.

12. There are six features of the Canadian banking system and mortgage market that helped prevent the development of a housing bubble during the last decade. First, Canada's

Financial Consumer Agency has a mission to prevent the development of a subprime housing market. Second, banks face higher capital requirements in Canada, which restricts their leverage to about half of that of American and European banks in 2006-07. Third, down payments on houses are 20 percent of the purchase price in Canada, in contrast to low or no down payments in the United States at the height of its housing bubble and there are restrictions on the amount of equity that can be taken out a home when a mortgage is refinanced. These mean that homeowners are less likely to find themselves with mortgages that exceed the value of their homes. Fourth, Canadian law allows a bank to claim non-housing assets from a homeowner if the homeowner attempts to walk away from his or her mortgage, which makes default on mortgages less likely. Fifth, mortgage interest is not tax deductible in Canada as it is in the United States; instead Canadian law allows for the deductibility of capital gains from housing, giving Canadian homeowners an incentive to pay off their mortgages rather than default on them. Finally, five large banks dominate Canadian financial markets. Together, these six features are reason why banks in Canada find mortgage lending profitable. As a result, mortgage securitization has not occurred in Canada.