JOINT ECONOMIC COMMITTEE

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RESEARCH REPORT #110-11
September 13, 2007

SUBPRIME MELTDOWN AND THE U.S. ECONOMY

Introduction. Near the end of the recent housing price surge, some households with poor credit histories bought homes through adjustable rate mortgage loans (ARMs) for high risk borrowers, known as **subprime residential mortgage loans**. After the interest rates on their loans were adjusted higher, some of these households have not been able to make regular payments.

Investment banks securitized subprime mortgage loans into **collateralized debt obligations** (CDOs) and sold risk-differentiated tranches of these CDOs to various investors. Over the summer of 2007, high delinquency and default rates among subprime residential mortgagers caused credit market participants to realize that these CDOs were more risky than previously thought.

During the first two weeks of August 2007, a panic in credit markets threatened to deny funds for private borrowings unrelated to housing and subprime residential mortgage CDOs. The Federal Reserve and other central banks acted to calm this panic by adding tens of billions of short-term liquidity to credit markets. These decisive and timely actions appear to have contained subprime problems from the rest of credit markets.

During the last week of August and the first week of September 2007, President Bush, the Federal Reserve, and other federal banking regulators have also acted to help subprime residential mortgagers that have the financial wherewithal to meet reasonable monthly mortgage payments to refinance their loans or to renegotiate the terms of their existing loans so that these mortgagers can stay in their homes.

What is the subprime market? The subprime market for residential mortgage loans serves households with one or more of the following risk characteristics:

- Recent payment delinquencies
- Judgments, foreclosures, repossessions, or charge-offs within prior two years
- Bankruptcy in the last five years
- Relatively high default probability
- Debt-service-to-income ratios of 50 percent or more

Mortgage banks and mortgage brokers, not commercial banks or other depository institutions, are the main originators of subprime mortgage loans. Mortgage banks originate subprime residential mortgage loans and then sell them to investment banks, while mortgage brokers originate subprime residential mortgage loans on behalf of investment banks.

Most of the subprime mortgage loans that have been originated in recent years are ARMs, interest-only mortgage loans (IOMs), and negatively amortizing mortgage loans (NegAmMs) rather than fixed-rate mortgage loans (FRMs). Investment banks then package subprime residential mortgage loans into CDOs.

Subprime mortgage loans are riskier than prime mortgage loans. In the second quarter of 2007, delinquency and foreclosure rates were far higher for subprime mortgage loans (14.82 percent and 2.72 percent, respectively) than for prime mortgage loans (2.73 percent and 0.27 percent, respectively).[1] Given this credit risk associated with subprime mortgage loans, investment banks:

- Over-collateralize subprime residential mortgage CDOs (i.e., the aggregate face value of all subprime mortgage loans in the CDO exceeds the face value of the CDO),
- Write put options in the subprime residential mortgage CDOs that require originators to repurchase subprime mortgage loans that become seriously delinquent or go into foreclosure within a specified time, and
- Divide subprime residential mortgage CDOs into risk tranches (i.e., senior tranches have a higher priority on the cash flow from subprime

residential mortgage CDOs than do junior tranches).

Based on these precautions, rating agencies such as Standard and Poor's and Moody's gave senior risk tranches in subprime residential mortgage CDOs investment grade ratings even though the underlying assets were not investment grade. These ratings helped investment banks sell the senior risk tranches in subprime residential mortgage CDOs to investors such as hedge funds, life insurers, pension funds, and wealthy individuals.

Federal Reserve economists estimated that subprime mortgage loans have increased from 5 percent of all residential mortgage loans originated in 1994 to 20 percent in 2005.[2] This expansion of subprime lending has helped to increase the overall homeownership rate from 64.0 percent in 1994 to 68.8 percent in 2006.[3]

Housing bubble and subprime mortgages. From 1997 to 2005, nominal U.S. housing prices swelled by an average of 7.5 percent a year, while real U.S. housing prices surged by an average of 5.0 percent a year.[4] Eventually, this housing bubble burst. Prices peaked in most U.S. housing markets during the second half of 2006.

Two characteristics of past asset bubbles – reckless loans and swindles – were present in the subprime segment of housing markets in recent years. First, households, home builders, realtors, mortgage banks and brokers, investment banks, and investors in subprime residential mortgage CDOs became euphoric about housing:

- Accelerating housing prices persuaded many households with marginal income, limited net worth, and poor credit history to buy homes.
- Mortgage loan underwriters loosened their credit standards.
- Investment bankers assumed that over-collateralization and put options substantially limited the risk in subprime residential mortgage CDOs.
- During a period of low interest rates, investors sought higher yields in subprime residential mortgage CDOs, ignoring that high yields imply high risk.

Second, swindlers took advantage of housing market participants while their guard was down:

- Some subprime mortgagers exaggerated their income and net worth to qualify for their loans.
- Some subprime mortgagers, knowing that they could not service their loans from their income, still bought homes. These subprime mortgagers speculated that they could flip (i.e., resell quickly) their homes for a profit.
- Some mortgage bankers and mortgage brokers pushed some subprime mortgagers into ARMs, IOMs, and NegAmMs to stretch their purchasing power. Some subprime mortgagers may not have understood how much the monthly payments of ARMs, IOMs, and NegAmMs can increase.
- Some mortgage bankers and mortgage brokers submitted false appraisals and financial information to qualify otherwise unqualified households for subprime mortgage loans.
- Some mortgage bankers and mortgage brokers did not document and verify the income, net worth, and credit history of subprime mortgagers.

Causes of the subprime meltdown. As interest rate adjustments in subprime ARMs took effect, the credit quality of subprime ARMs rapidly deteriorated. From the fourth quarter of 2004 to the first quarter of 2007, the delinquency rate for subprime ARMs jumped from 9.83 percent to 15.75 percent, while the foreclosure rate for subprime ARMs spiked from 1.50 percent to 3.23 percent.[5] A similar deterioration occurred in subprime IOMs and NegAmMs.

In late 2006, this deterioration in the credit quality of subprime mortgage loans became apparent to investment banks. They reduced their purchases of subprime mortgage loans for CDOs from originators. Because many of these originators were thinly capitalized and dependent on their cash flow, more than 25 subprime mortgage originators, including the largest New Century Financial, filed for bankruptcy during the first half of 2007.

On March 13, 2007, the *Wall Street Journal* reported that "banks and larger mortgage lenders are trying to force smaller mortgage lenders to buy back some of the same loans that the larger entities eagerly purchased from the smaller mortgage originators in 2005 and 2006 by enforcing what the industry calls repurchase agreements."[6] However,

bankruptcies had made many of these put options worthless.

On June 28, 2007, the Federal Reserve and other federal banking regulators jointly issued new guidelines requiring depository institutions to evaluate strictly a borrower's ability to repay a home mortgage loan. While these guidelines do not immediately affect state-regulated mortgage banks and mortgage brokers, state regulators are expected to follow suit.

Panic in credit markets during August 2007. During the spring and summer of 2007, higher than expected delinquency and default rates among subprime residential mortgagers caused credit market participants to re-evaluate the risk inherent in subprime residential mortgage CDOs. The ABX - Home Equity Index (BBB- credit rating) is a key indicator of investors' estimation of the risk of funding subprime mortgage loans through secondary markets. This index fell from 97.47 in January 2007 to 31.96 in August 2007.[7]

News stories raised fears among credit market participants about the risk exposure in various financial institutions to subprime residential mortgage CDOs. These include:

- On June 20, 2007, Merrill Lynch seized the assets from two Bear Stearns hedge funds that had invested in subprime residential mortgage CDOs. These funds became worthless.
- On August 6, 2007, American Home Mortgage Investment Corporation, the 10th largest originator of residential mortgage loans in the United States, filed for Chapter 11 bankruptcy.
- On August 7, 2007, German banks organized a bailout for IKB Deutsche Industriebank AG. IKB was in trouble because of its investments in subprime residential mortgage CDOs.
- On August 9, 2007, a French bank, BNP Paribas, suspended withdrawals from three of its hedge funds that had invested in subprime residential mortgage CDOs.
- On August 13, 2007, Goldman Sachs and a group of investors injected $3 billion to bailout Goldman-Sachs' Global Equity Opportunities hedge fund that lost about 28 percent of its market value in the previous week.
- On August 16, 2007, Countrywide Financial, the largest residential mortgage loan underwriter in the United States, announced its intent to draw down its entire $11.5 billion standby line of credit with 40 major banks, because of a liquidity crisis after major rating agencies downgraded Countrywide's debt securities to junk status.

Uncertainty about risk exposure fed a panic in credit markets. Market participants either ceased buying many types of private debt instruments, even those unrelated to housing and subprime residential mortgage CDOs, or market participants demanded substantially higher interest rate risk premiums.

This panic in credit markets caused equity prices to slip in exchanges around the world. From a peak close of 14,000.41 on July 19, 2007, the Dow-Jones Industrial Average fell by 8.2 percent to a close of 12,845.76 on August 16, 2007.

Over a two-week period ending on August 17, 2007, the Federal Reserve, the European Central Bank, the Bank of Japan, and other central banks acted decisively to stem the panic by pumping tens of billions of short-term liquidity into the banking system. On August 17, the Federal Reserve lowered its discount rate by 50 basis points to 5.75 percent.

The panic subsided. Although risk premiums are higher than before the panic, the availability of credit for firms unrelated to the subprime residential mortgage CDOs has improved. For example, the risk premium for one month non-financial commercial paper over comparable Treasury bills grew from an average of 31 basis points during the first seven months of 2007 to a peak of 276 basis points on August 20, 2007, before declining to an average of 79 basis points during the week of September 3-7, 2007.

Equity prices have also stiffened. The Dow-Jones Industrial Average was up 2.1 percent from August 16, 2007, to close at 13,113.38 on September 7, 2007.

Implications for the housing sector. The combination of (1) an awareness of the credit risks associated with subprime mortgage loans among originators, investment banks, and investors; and (2) new regulations, will make it more difficult for some households with low income, limited net worth, and poor credit history to qualify for subprime residential mortgage loans. Toughening underwriting standards will eventually reduce the

surge in delinquency and foreclosure rates among subprime mortgage loans.

From 1990 to 1994, nominal U.S. housing prices grew by an average of 1.5 percent a year, while real U.S. housing prices fell by an average of 2.0 percent a year.[8] Many economists predict that U.S. housing prices are likely to behave in a similar fashion over the next few years. During the second quarter of 2007, the S&P/Case-Shiller Home Price Index fell at annualized rate of 3.8 percent.[9]

Toughening underwriting standards for subprime residential mortgage loans will also reduce the number of potential buyers for lower-priced homes. This is likely to intensify the price weakness in lower-priced homes compared with other segments of U.S. housing markets over the next few years.

Assistance to subprime residential mortgagers. Both President Bush and the Federal Reserve have acted during the last week to assist subprime residential mortgagers that have the financial wherewithal to meet reasonable monthly mortgage payments to refinance their loans or to renegotiate the onerous terms of their existing loans so that these mortgagers can stay in their homes. Subprime mortgagers are disproportionately members of minority groups and typically have less financial sophistication and fewer borrowing options than prime mortgagers.

On August 31, 2007, Bush authorized Secretary of Housing and Urban Affairs Alphonso Jackson to implement a new initiative, "FHA Secure," to allow the Federal Housing Administration (FHA) to help subprime mortgagers that have good credit histories, but have missed one mortgage payment to refinance their loans through FHA. Bush also requested that Congress:

- Pass an *FHA Modernization Act* to allow the FHA to accept lower down payments and insure bigger residential mortgage loans; and
- Stop the taxation of a reduction in the mortgage loan amount. Under current tax law, a reduction in the mortgage loan balance arising from a re-negotiation with the mortgagee is treated as taxable income to the mortgager.

On September 3, 2007, the Federal Reserve and other federal banking regulators have directed commercial banks and other depository institutions to review their authority under existing residential mortgage loan pooling and servicing agreements to identify mortgagers at risk of default and offer to refinance their mortgage loans to help them stay in their homes.

Conclusion. After credit market participants discovered that subprime residential mortgage CDOs were riskier than previously thought, fears about default risk spread, and the value of these CDOs fell. Banks, hedge funds, and other institutions that invested in these CDOs faced potential liquidity problems.

Decisive and timely actions by the Federal Reserve and other central banks to increase short-term liquidity stemmed the panic in credit markets during the first two weeks of August 2007. These decisive and timely actions appear to have lessened liquidity problems and calmed the credit markets, at least for the time being. Moreover, President Bush, the Federal Reserve, and other federal banking regulators have acted to help subprime residential mortgagers that have the ability to meet reasonable monthly mortgage payments to refinance their loans or to renegotiate the terms of their existing loans so that these mortgagers can stay in their homes.

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[1] Mortgage Bankers Association/Haver Analytics.
[2] Robert B. Avery, Kenneth P. Brevoort, and Glenn B. Canner, "Higher-Priced Home Lending and the 2005 HMDA Data," *Federal Reserve Bulletin* (Sept. 8, 2006), A-123.
[3] U.S. Department of Commerce, Bureau of the Census. Found at: http://www.census.gov/hhes/www/housing/hvs/annual06/ann06t20.html
[4] OFHEO Housing Price Index/Haver Analytics and Consumer Price Index-All Urban Consumers/Haver Analytics. Calculations by author.
[5] Mortgage Bankers Association/Haver Analytics.
[6] "Banks Go on Subprime Offensive," *Wall Street Journal* (March 13, 2007).
[7] Markit. Found at: http://www.markit.com/information/affiliations/abx.
[8] OFHEO Housing Price Index/Haver Analytics and Consumer Price Index-All Urban Consumers/Haver Analytics. Calculations by author.
[9] S&P, Fishserv, and MacroMarkets LLC/Haver Analytics.