Putting the Financial Crisis and Lending Activity in a Broader Context

Some economists, policymakers, and pundits view the financial turmoil that began in August 2007 as the worst financial shock to the U.S. economy since the end of World War II. Some even assert that it amounts to the worst financial crisis since the 1930s. Accordingly, the Federal Reserve and other government agencies have taken aggressive actions to support the financial system and spur economic growth. Other economists and analysts, citing continued modest loan growth and relatively few bank failures last year (compared with, say, the late 1980s and early 1990s), do not share this view. Regardless, many banks have announced sharp earnings declines, and the possibility of further financial losses looms large.

A well-functioning financial sector is crucial to the performance of the U.S. economy. In a market-based economy, the financial sector channels the supply of funds from savers to the demands of borrowers, which supports the wealth-creating abilities of the entrepreneurial sector. At the same time, the performance of the financial sector also depends crucially on the health of the U.S. economy. Typically, growth of loans and leases at commercial banks declines sharply before a recession.

Clearly, bank actions to limit the credit supply can exacerbate an economic downturn. For example, banks typically tighten credit standards and/or loan terms as the economy weakens and nonperforming loans increase. But an adverse shock from outside the financial sector can be just as important—such as a sharp increase in oil prices or a plunge in house prices. Such shocks also slow the demand for credit because of weaker future growth of incomes and profits. In large and open economies, forces that trigger changes in the supply and demand for credit are often synchronized and difficult to distinguish.

Thus, it is not surprising that bank loans slowed when GDP growth slowed: When GDP averaged 2.7 percent for 2004-07, the growth of bank loans averaged 11.4 percent per year; when GDP fell slightly in 2008, growth of bank loans slowed to 5.6 percent. Most forecasters expect recessionary conditions through the first half of 2009, so continued weak growth of bank loans is likely. Indeed, in the 1990-91 and 2001 recessions, the year-to-year percentage decline in bank loans did not reach a trough until February 1993 and March 2002, respectively.

Other factors have weakened household and business spending in the current recession and thus have adversely affected the supply and demand for bank loans. A 52 percent drop in the S&P 500 stock price index from October 9, 2007, to November 20, 2008, accompanied the oil shock and fall in house prices. Accordingly, household net worth (financial and tangible net wealth) fell by about $7 trillion between 2007:Q2 and 2008:Q3. Another key factor has been the simultaneous slowing in economic growth in most of the world’s largest economies, which is important because exports were a key source of U.S. economic growth in 2004-07.

Some claim the key cause of slower growth has been the losses and write-downs incurred by banks and other financial institutions that hold asset-backed securities (ABS) on their balance sheets.1 In particular, prices of nonprime mortgage–related ABS have plummeted in part because of rising mortgage defaults and foreclosures stemming from falling house prices and a weakening economy. Because many of these ABS are no longer actively traded, determining their price—and thus the impact on the banking system’s lending capacity—has been a key source of the uncertainty in financial markets. As a result, many firms have been extremely cautious in lending because of the perceived risk in lending to parties who may have substantial ABS losses. Some estimate that these losses may eventually exceed $2 trillion, but even those estimates depend importantly on the pace of economic recovery. Moreover, not all firms hold ABS on their balance sheets, so the perception of increased credit risk—arising in part from poor macroeconomic conditions—has affected markets more broadly.

A report prepared for the 2008 U.S. Monetary Policy Forum argued that the financial crisis will begin to wane when (i) banks and other financial institutions can raise enough new equity capital to improve their balance sheets and (ii) risk and uncertainty recede enough that firms are less reticent about making loans.2 A more stable macroeconomic environment will go far toward achieving this outcome.

Kevin L. Kliesen

1 This development is a by-product of the securitization of a wide swath of the U.S. credit markets that has created a so-called shadow banking system.

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Conventions used in this publication:

1. Unless otherwise indicated, data are monthly.
2. Shaded areas indicate recessions, as determined by the National Bureau of Economic Research.
3. Percent change at an annual rate is the simple, not compounded, monthly percent change multiplied by 12. For example, using consecutive months, the percent change at an annual rate in \( x \) between month \( t-1 \) and the current month \( t \) is: \( \left( \frac{x_t}{x_{t-1}} - 1 \right) \times 1200 \). Note that this differs from National Economic Trends. In that publication, monthly percent changes are compounded and expressed as annual growth rates.
4. The percent change from year ago refers to the percent change from the same period in the previous year. For example, the percent change from year ago in \( x \) between month \( t-12 \) and the current month \( t \) is: \( \left( \frac{x_t}{x_{t-12}} - 1 \right) \times 100 \).

We welcome your comments addressed to:

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On March 23, 2006, the Board of Governors of the Federal Reserve System ceased the publication of the M3 monetary aggregate. It also ceased publishing the following components: large-denomination time deposits, RPs, and eurodollars.
Data available as of January 2009. Note: Effective December 16, 2008, FOMC reports the intended Federal Funds Rate as a range.
MZM and M1

Percent change from year ago

M2

Percent change from year ago

M3*

Percent change from year ago

*See table of contents for changes to the series.

Monetary Services Index - M2**

Percent change from year ago

**We will not update the MSI series until we revise the code to accommodate the discontinuation of M3.
M1
Percent change at an annual rate

MZM
Percent change at an annual rate

M2
Percent change at an annual rate

M3*
Percent change at an annual rate

*See table of contents for changes to the series.
Adjusted and Required Reserves
Billions of dollars

Total Borrowings, nsa
Billions of dollars

Excess Reserves plus RCB Contracts
Billions of dollars

* Data exclude term auction credit

Nonfinancial Commercial Paper
Percent change from year ago

As of April 10, 2006, the Federal Reserve Board made major changes to its commercial paper calculations. For more information, please refer to http://www.federalreserve.gov/releases/cp/about.htm.

Consumer Credit
Percent change from year ago
The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph.

See the notes section for an explanation of the chart.
Monetary Trends

Short-Term Interest Rates

Long-Term Interest Rates

FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

Data available as of January 2009.

Federal Funds Rate and Inflation Targets

Calculated federal funds rate is based on Taylor's rule.

Components of Taylor’s Rule

Actual and Potential Real GDP
Billions of chain-weighted 2000 dollars

PCE Inflation

See notes on page 19.

Monetary Base Growth* and Inflation Targets

*Modified for the effects of sweeps programs on reserve demand.

Components of McCallum's Rule
**Monetary Trends**

**Velocity**
Nominal GDP/MZM, Nominal GDP/M2 (Ratio Scale)

**Interest Rates**
Percent

**MZM Velocity and Interest Rate Spread**
Ratio Scale

**M2 Velocity and Interest Rate Spread**
Ratio Scale

[Graphs and charts showing velocity and interest rate trends for MZM and M2 over time.]
Bank Credit
Percent change from year ago

Investment Securities in Bank Credit at Commercial Banks
Percent change from year ago

Total Loans and Leases in Bank Credit at Commercial Banks
Percent change from year ago

Commercial and Industrial Loans at Commercial Banks
Percent change from year ago
Recent Inflation and Long-Term Interest Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Consumer Price Inflation Rates</th>
<th>Long-Term Government Bond Rates</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Percent change from year ago</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td>2008Q1 2008Q2 2008Q3 2008Q4</td>
<td>Oct08   Nov08   Dec08   Jan09</td>
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<tr>
<td>United States</td>
<td>4.17  4.29  5.27  1.52</td>
<td>3.81   3.53   2.42   2.52</td>
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<td>Canada</td>
<td>1.78  2.35  3.43  .</td>
<td>3.67   3.56   2.98   .</td>
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<tr>
<td>France</td>
<td>2.95  3.30  3.25  .</td>
<td>4.18   3.98   .     .</td>
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<tr>
<td>Germany</td>
<td>2.92  2.90  3.07  .</td>
<td>3.88   3.56   3.05   .</td>
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<tr>
<td>Italy</td>
<td>3.06  3.57  3.97  2.80</td>
<td>4.78   4.74   .     .</td>
</tr>
<tr>
<td>Japan</td>
<td>0.96  1.37  2.16  .</td>
<td>1.51   1.47   1.31   1.25</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2.38  3.37  4.81  .</td>
<td>4.58   4.26   3.62   3.67</td>
</tr>
</tbody>
</table>

Inflation and Long-Term Interest Rate Differentials

Inflation differential = Foreign inflation less U.S. inflation
Long-term rate differential = Foreign rate less U.S. rate
### Money Stock

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3*</th>
<th>Bank Credit</th>
<th>Adjusted Monetary Base</th>
<th>Reserves</th>
<th>MSI M2**</th>
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<tbody>
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<td><strong>2004</strong></td>
<td>1344.402</td>
<td>6556.928</td>
<td>6248.406</td>
<td>9234.718</td>
<td>6595.613</td>
<td>776.768</td>
<td>96.129</td>
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<tr>
<td><strong>2005</strong></td>
<td>1371.752</td>
<td>6897.133</td>
<td>6515.975</td>
<td>9798.477</td>
<td>7247.386</td>
<td>806.628</td>
<td>96.560</td>
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<tr>
<td><strong>2006</strong></td>
<td>1347.058</td>
<td>6968.483</td>
<td>6842.763</td>
<td>10072.74</td>
<td>7958.671</td>
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<td>94.913</td>
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<td><strong>2007</strong></td>
<td>1359.76</td>
<td>7619.362</td>
<td>7235.304</td>
<td>8742.766</td>
<td>94.129</td>
<td>94.200</td>
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<td><strong>2008</strong></td>
<td>1423.574</td>
<td>8686.158</td>
<td>7727.788</td>
<td>9555.782</td>
<td>1009.761</td>
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<td>8242.801</td>
<td>9809.100</td>
<td>1727.933</td>
<td>869.916</td>
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</table>

**Note:** All values are given in billions of dollars. *See table of contents for changes to the series.

**We will not update the MSI series until we revise the code to accommodate the discontinuation of M3.**
### Monetary Trends

#### Federal Funds Credit Rate and Primary Credit Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Federal Funds</th>
<th>Primary Credit Rate</th>
<th>3-mo CDs</th>
<th>3-mo Treasury Yields</th>
<th>10-yr Treasury Yields</th>
<th>Corporate Aaa Bonds</th>
<th>Municipal Aaa Bonds</th>
<th>Conventional Mortgage</th>
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<tbody>
<tr>
<td>2004</td>
<td>1.35</td>
<td>2.34</td>
<td>4.34</td>
<td>1.56</td>
<td>1.40</td>
<td>2.78</td>
<td>4.27</td>
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</tr>
<tr>
<td>2005</td>
<td>3.21</td>
<td>4.19</td>
<td>6.19</td>
<td>3.51</td>
<td>3.21</td>
<td>3.93</td>
<td>4.29</td>
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<td>2006</td>
<td>4.96</td>
<td>5.96</td>
<td>7.96</td>
<td>5.15</td>
<td>4.85</td>
<td>4.77</td>
<td>4.79</td>
<td>5.59</td>
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<td>5.86</td>
<td>8.05</td>
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<td>4.34</td>
<td>4.63</td>
<td>5.56</td>
</tr>
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<td>2.97</td>
<td>1.39</td>
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#### Federal Reserve Bank of St. Louis

Note: All values are given as a percent at an annual rate.
## Monetary Trends

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<table>
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<td>4.45</td>
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<tr>
<td></td>
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<td>1.49</td>
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<td>23.07</td>
<td>13.05</td>
<td></td>
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</tbody>
</table>

*See table of contents for changes to the series.
Definitions

M1: The sum of currency held outside the vaults of depository institutions, Federal Reserve Banks, and the U.S. Treasury, travelers checks; and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions), minus cash items in process of collection and Federal Reserve float.

M2: M1 plus savings deposits (including money market deposit accounts) and small-denomination (under $100,000) time deposits issued by financial institutions; and shares in retail money market mutual funds (funds with initial investments under $50,000), net of retirement accounts.

M3: M2 plus large-denomination ($100,000 or more) time deposits; repurchase agreements issued by depository institutions; Eurodollar deposits, specifically, dollar-denominated deposits due to nonbank U.S. addresses held at foreign offices of U.S. banks worldwide and all banking offices in Canada and the United Kingdom; and institutional money market mutual funds (funds with initial investments of $50,000 or more).

Bank Credit: All loans, leases, and securities held by commercial banks.

Domestic Nonfinancial Debt: Total credit market liabilities of the U.S. Treasury, federally sponsored agencies, state and local governments, households, and nonfinancial firms. End-of-period basis.

Adjusted Monetary Base: The sum of currency in circulation outside Federal Reserve Banks and the U.S. Treasury, deposits of depository financial institutions at Federal Reserve Banks, and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This series is a spliced chain index; see Anderson and Rasche (1996a,b, 2001, 2003).

Adjusted Reserves: The sum of vault cash and Federal Reserve Bank deposits held by depository institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This spliced chain index is numerically larger than the Board of Governors’ measure, which excludes vault cash not used to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required clearing balance contracts; see Anderson and Rasche (1996a, 2001, 2003).

Monetary Services Index: An index that measures the flow of monetary services received by households and firms from their holdings of liquid assets; see Anderson, Jones, and Nesmith (1997). Indexes are shown for the assets included in M2, with additional data at research.stlouisfed.org/missi/index.html.

Note: M1, M2, M3, Bank Credit, and Domestic Nonfinancial Debt are constructed and published by the Board of Governors of the Federal Reserve System. For details, see Statistical Supplement to the Federal Reserve Bulletin, tables 1.21 and 1.26. MZM, Adjusted Monetary Base, Adjusted Reserves, and Monetary Services Index are constructed and published by the Research Division of the Federal Reserve Bank of St. Louis.

Notes

Page 3: Readers are cautioned that, since early 1994, the level and growth of M1 have been depressed by retail sweep programs that reclassify transactions deposits (demand deposits and other checkable deposits) as savings deposits overnight, thereby reducing banks’ required reserves; see Anderson and Rasche (2001) and research.stlouisfed.org/aggrep/swdata.html. Primary Credit Rate, Discount Rate, and Intended Federal Funds Rate shown in the chart Reserve Market Rates are plotted as of the date of the change, while the Effective Federal Funds Rate is plotted as of the end of the month. Interest rates in the table are monthly averages from the Board of Governors H.15 Statistical Release. The Treasury Yield Curve and Real Treasury Yield Curve show constant maturity yields calculated by the U.S. Treasury for securities 5, 7, 10, and 20 years to maturity. Inflation-Indexed Treasury Yield Spreads are a measure of inflation compensation at those horizons, and it is simply the nominal constant maturity yield less the real constant maturity yield. Daily data and descriptions are available at research.stlouisfed.org/ftse2/. See also Statistical Supplement to the Federal Reserve Bulletin, table 1.35. The 30-year constant maturity series was discontinued by the Treasury as of February 18, 2002.

Page 5: Checkable Deposits is the sum of demand and other checkable deposits. Savings Deposits is the sum of money market deposit accounts and passbook and statement savings. Time Deposits have a minimum initial maturity of 7 days. Large Time Deposits are deposits of $100,000 or more.

Retail and Institutional Money Market Mutual Funds are as included in M2 and the non-M2 component of M3, respectively.

Page 7: Excess Reserves plus RCB (Required Clearing Balance) Contracts equals the amount of deposits at Federal Reserve Banks held by depository institutions but not applied to satisfy statutory reserve requirements. (This measure excludes the vault cash held by depository institutions that is not applied to satisfy statutory reserve requirements.) Consumer Credit includes most short- and intermediate-term credit extended to individuals. See Statistical Supplement to the Federal Reserve Bulletin, table 1.55.

Page 8: Inflation Expectations measures include the quarterly Federal Reserve Bank of Philadelphia Survey of Professional Forecasters, the monthly University of Michigan Survey Research Center’s Surveys of Consumers, and the annual Federal Open Market Committee (FOMC) range as reported to the Congress in the February testimony that accompanies the Monetary Policy Report to the Congress. Beginning February 2000, the FOMC began using the personal consumption expenditures (PCE) price index to report its inflation range; the FOMC then switched to the PCE chain-type price index excluding food and energy prices (“core”) beginning July 2004. Accordingly, neither are shown on this graph. CPI Inflation is the percentage change from a year ago in the consumer price index for all urban consumers. Real Interest Rates are ex post measures, equal to nominal rates minus year-over-year CPI inflation.

From 1991 to the present the source of the long-term PCE inflation expectations data is the Federal Reserve Bank of Philadelphia’s Survey of Professional Forecasters. Prior to 1991, the data were obtained from the Board of Governors of the Federal Reserve System. Realized (actual) inflation is the annualized rate of change for the 40-quarter period that corresponds to the forecast horizon (the expectations measure). For example, in 1965:Q1, annualized PCE inflation over the next 40 quarters was expected to average 1.7 percent. In actuality, the average annualized rate of change measured 4.8 percent from 1965:Q1 to 1975:Q1. Thus, the vertical distance between the two lines in the chart at any point is the forecast error.

Page 9: FOMC Intended Federal Funds Rate is the level (or midpoint of the range, if applicable) of the federal funds rate that the staff of the FOMC expected to be consistent with the desired degree of pressure on bank reserve positions. In recent years, the FOMC has set an explicit target for the federal funds rate.

Page 10: Federal Funds Rate and Inflation Targets shows the observed federal funds rate, quarterly, and the level of the funds rate implied by applying Taylor’s (1993) equation

\[ f_t = 2.5 + \pi_{t-1} + \left( \pi_{t-1} - \pi_s \right) / 2 \]

to five alternative target inflation rates, \( \pi_s = 0, 1, 2, 3, 4 \) percent, where \( f_t \) is the implied federal funds rate, \( \pi_{t-1} \) is the previous period’s inflation rate (PCE) measured on a year-over-year basis, \( \pi_{t-1} \) is the log of the previous period’s level of real gross domestic product (GDP), and \( \pi_{t-1} \) is the log of an estimate of the previous period’s level of potential output. Potential Real GDP is as estimated by the Congressional Budget Office.

Monetary Base Growth and Inflation Targets shows the quarterly growth of the adjusted monetary base (modified to include an estimate of the effect of sweep programs) implied by applying McCallum’s (1988, 1993) equation

\[ \Delta MB_t = \pi + (10-year moving average growth of real GDP) - (4-year moving average of base velocity growth) \]

\[ - (10-year moving average growth of real GDP) \]

\[ - (4-year moving average growth of real GDP) \]

\[ - (4-year moving average growth of real GDP) \]

\[ - (4-year moving average growth of real GDP) \]

\[ - (4-year moving average growth of real GDP) \]

\[ - (4-year moving average growth of real GDP) \]

\[ - (4-year moving average growth of real GDP) \]
((y_t - y_{t-40})/40) \equiv 400, \text{ where } y_t \text{ is the log of real GDP. The 4-year moving average of base velocity growth is calculated similarly. To adjust the 4-year moving base for the effect of retail-deposit sweep programs, we add to the monetary base an amount equal to 10 percent of the total amount swept, as estimated by the Federal Reserve Board staff. These estimates are imprecise, at best. Sweep program data are found at research.stlouisfed.org/aggreg/swdata.html.}

Page 11: Implied One-Year Forward Rates are calculated by this bank from Treasury constant maturity yields. Yields to maturity, R(m), for securities with m = 1, ..., 10 years to maturity are obtained by linear interpolation between reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987).
\begin{align*}
R(m) &= a_0 + (a_1 + a_2)(1 - e^{-m(50)})(m/50) - a_2 \cdot e^{-m(50)},
\end{align*}
and forward rates are calculated from these smoothed yields using equation (a) in table 13.1 of Shiller (1990),
\begin{align*}
f(m) &= [D(m)R(m) - D(m-1)I(D(m) - D(m-1)],
\end{align*}
where duration is approximated as \(D(m) = (1 - e^{-R(m) \cdot m})/R(m).\) These rates are linear approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see Sharpe (1997).

Rates on 3-Month Eurodollar Futures and Rates on Selected Federal Funds Futures Contracts trace through time the yield on three specific contracts. Rates on Federal Funds Futures on Selected Dates displays a single day’s snapshot of yields for contracts expiring in the months shown on the horizontal axis. Inflation-Indexed Treasury Securities and Yield Spreads are those plotted on page 3. Inflation-Indexed 10-Year Government Notes shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2015, the current U.K. note has a maturity date of 8/16/2013, and the current U.S. note has a maturity date of 1/15/2018. Inflation-Indexed Treasury Yield Spreads and Inflation-Indexed 10-Year Government Yield Spreads equal the difference between the yields on the most recently issued inflation-indexed securities and the unadjusted security yields of similar maturity.

Page 12: Velocity (for MZM and M2) equals the ratio of GDP, measured in current dollars, to the level of the monetary aggregate. MZM and M2 Own Rates are weighted averages of the rates received by households and firms on the assets included in the aggregates. Prior to 1982, the 3-month T-bill rates are secondary market yields. From 1982 forward, rates are 3-month constant maturity yields.

Page 13: Real Gross Domestic Product is GDP as measured in chained 2000 dollars. The Gross Domestic Product Price Index is the implicit price deflator for GDP, which is defined by the Bureau of Economic Analysis, U.S. Department of Commerce, as the ratio of GDP measured in current dollars to GDP measured in chained 2000 dollars.

Page 14: Investment Securities are all securities held by commercial banks in both investment and trading accounts.

Page 15: Inflation Rate Differentials are the differences between the foreign consumer price inflation rates and year-over-year changes in the U.S. all-items Consumer Price Index.

Page 17: Treasury Yields are Treasury constant maturities as reported in the Board of Governors of the Federal Reserve System’s H.15 release.

Sources

Agence France Trésor: French note yields.

Bank of Canada: Canadian note yields.


Board of Governors of the Federal Reserve System:


Bureau of Economic Analysis: GDP.

Bureau of Labor Statistics: CPI.

Chicago Board of Trade: Federal funds futures contract.

Chicago Mercantile Exchange: Eurodollar futures.

Congressional Budget Office: Potential real GDP.


Federal Reserve Bank of St. Louis: Adjusted monetary base and adjusted reserves, monetary services index, MZM own rate, one-year forward rates.

Organization for Economic Cooperation and Development: International interest and inflation rates.

Standard & Poor’s: Stock price-earnings ratio, stock price composite index.

University of Michigan Survey Research Center: Median expected price change.


References


