**CHAPTER 7**

**MONEY MARKETS**

**CHAPTER OVERVIEW AND LEARNING OBJECTIVES**

* This is the first of six chapters related to the study of financial markets. They are: (1) Money Markets; (2) Bond Markets; (3) Mortgage Markets; (4) Equity Markets (5) Derivatives Markets; and (6) International Markets.
* In part four and five of this text we will study specific financial institutions and their involvement (investing and/or financing) in various markets. Before then we will study specific financial markets, the securities of the markets, the players in the market (buyers/sellers), and the current market trends of each. As you study each, compare and contrast the securities, traders, and characteristics of other markets.
* Here is a list of specific ways to differentiate markets, securities, etc., so that you can study and analyze any financial market structure in the future.
  1. Market Characteristics - Identify and analyze the type of security and the major buyers and sellers.
  2. Organization of the primary market (new issues) vs. secondary market.
  3. Spot (current trading for cash) vs. futures (trading in future based on prices set today).
  4. Organized exchange trading (broker) vs. over-the-counter (dealer).
  5. Trading procedures used - negotiated price or auction (NYSE).
  6. Location of market.
  7. Regulation of market.
* Securities may be compared/contrasted on the basis of the following:
* Denomination - Minimum, maximum, and average.
* Maturity.
* Claim against issuer - Debt or equity.
* Collateral involved or unsecured.
* Coupon change period – For variable-rate securities, how often the coupon rate is reset.
* Marketability of security - Extent of secondary market.
* Form of interest payment - Discount or coupon interest.
* Interest computation period - 360 or 365 days, or the effective annual compound rate.

**CAREER PLANNING NOTE: ANALYSIS OF THE ENTRY-LEVEL JOB MARKET**

In your microeconomics course you studied various market structures, from pure competition to monopoly. Ideally, in a pure competitive market study you looked at conditions that produced the largest output (Q) and minimum price (P) that maximized consumer welfare. The market conditions that producers faced were:

1. a large number of sellers.

2. ease of entry and exit from the market.

3. a homogeneous, non-differentiated product.

4. reliable information about costs, competitors, markets, futures, etc.

Now let us analyze the entry-level job market to see (1) what market situation you are facing and (2) some activities and actions that you can take to enhance your chances in that market. Most of us realize right away that we are participating in an imperfect market. Knowledge about positions is limited; few potential employers know where you are! Employers are sifting through the heterogeneous product (graduating seniors) determined to find that special person. You are writing resumes, pulling grades and part-time experience to differentiate yourself from others. You are competing with many others for the few special positions, and the employer is only able to talk to a few candidates per day when they arrive at campus.

As a seller in this market, you have to differentiate yourself (know your talents) and enhance your knowledge of positions available. Everyone on campus knows about the firms and jobs through the placement office, but you need to seek out other opportunities, mostly by meeting people. Try Wall Street, Baltimore, Chicago, San Francisco, or a city or firm where you can work on your career plan. Use every contact that you have and seek many that you don’t currently have. Remember that your competition is not just the other students in your class, but also every graduate from within the U.S. as well as abroad!

**READING *THE WALL STREET JOURNAL*: READING THE MONEY RATES**

The “Money Rates” column in the “Money & Investing” section of T*he Wall Street Journal* is useful for tracking money market rates of interest. You will notice that the differences in rates for the various money market securities are pretty small due to the fact that many of the securities act as close substitutes for one another in investment portfolios. From an investor’s perspective, there is little difference between commercial paper and banker’s acceptance, so the yields on the securities tend to be very similar.

**TOPIC OUTLINE AND KEY TERMS**

I. **Nature of the Money Market**

***A.*** ***Overview of the Money Market***

1. Short-term debt market - most under 120 days

2. A few high quality borrowers

3. Many diverse investors

4. Informal market centered in New York City

5. Standardized securities - one security is a close substitute for another

6. Good marketability - secondary market

7. Large, wholesale open-market transactions

8. Many brokers and dealers are competitively involved in the money market.

9. Payments in immediately available funds.

10. Physical possession of securities is rare - centralized safekeeping.

***B.*** ***Economic Role of Money Market (MM)***

1. Provides a source of liquidity for investors

2. Liquidity status of commercial banks is reflected

3. Provides a place for Federal Reserve transactions **(*open market transactions*)**

4. Indicator of economic conditions

***C.*** ***Characteristics of Money Market Instruments***

1. Low default risk

2. Short maturity

3. High marketability

Money market instruments include (see Exhibit 7.3):

a. U.S. Treasury securities.

b. negotiable certificates of deposit.

c. commercial paper.

d. federal agency securities.

e. bankers' acceptances.

f. repurchase agreements.

g. Federal Funds.

II. **Money Market Participants** (Lenders and Borrowers) (see Exhibit 7.12).

***A.*** ***Commercial Banks*** - Most Important Participant in the MM

1. Bank *assets or investments*

a. Treasury bills

b. Agency securities

c. Bankers' acceptances (from other banks)

d. Federal Funds sold

e. Repurchase agreements (securities purchased under agreements to resell)

2. Bank *liabilities or borrowing*

a. Negotiable CDs

b. Commercial paper

c. Bankers' acceptances

d. Federal Funds purchased

e. Reverse repurchase agreements (securities sold under agreements to repurchase)

3. MM securities provide sources and uses of liquidity due to wide fluctuations in loans and deposits.

***B.*** ***The Federal Reserve System***

1. Money market securities are the major asset category of the Fed.

2. Open-market operations (buying and selling of MM securities by Fed) increases and decreases member bank reserves.

a. Purchase - increases member bank reserves.

b. Sale - decreases member bank reserves.

***C.*** ***Dealers in MM Securities*** - Involved in both primary and secondary markets.

1. Purchase new treasury debt and resell it (primary). Primary dealers' trading volumes in U.S. Government securities averaged about $454 billion per day during 2003.

2. "Makes a market" by buying/selling MM securities (bid/ask).

3. Dealers have a very small capital base. They are highly leveraged, often up to 500 or 600 times the value of their equity. They borrow from various sources including banks, insurance companies, and federal agencies. Loans are usually for one day and most often in the form of repurchase agreements.

4. Little regulation until the Government Security Act of 1986.

a. Legislation was passed after several small dealers failed.

b. Security custodial arrangements were standardized.

c. Previously unregulated government security dealer firms are now regulated like other security dealers, including financial record keeping, minimum capital adequacy levels, and customer protection standards.

***D.*** ***Corporations*** invest and borrow in the money market to balance cash flows. As can be seen from Exhibit 7.12, corporations invest in a variety of money market securities. The larger firms also issue commercial paper, while smaller firms rely on bank loans and lines of credit to meet its short-term liquidity needs.

**III.** **Treasury Bills** - Ideal Money Market Instrument

***A.*** ***Characteristics***

1. Sold on discount basis

2. Maturities up to one year

3. Multiple denominations up to $1 million.

4. Minimum denomination is usually $10,000, but smaller investors can invest in multiples of $1,000 through the Treasury Direct Program (see Exhibit 7.5).

***B****.* ***Pricing Treasury Bills***

1. Treasury bills are priced on a ***bank discount yield (yd)*** basis, a traditional yield calculation.

2. The bank discount rate, yd, is:



3. In the section on **Treasury Bonds, Bills & Notes**, *The Wall Journal* lists T-Bill yields (both bid and ask) as bank discount yields as well as on a bond equivalent basis (asked yield). This bond equivalent yield (ybe) or coupon equivalent yield (CEY) allows an investor to compare more accurately a discount rate security like the T-bill to a coupon bearing security for the same maturity. This bond equivalent yield differs from the bank discount yield in two ways - the discounted price is the denominator and 365 days is used as the annualizer. This causes the bond equivalent yield (ybe) to always to be greater than the bank discount yield (yd).



***C.* *Auctioning New Bills***

1. Weekly sale by U. S. Treasury of three- and six-month maturities; longer-term bills, monthly or quarterly.

2. T-bills are sold through an auction process using both competitive and noncompetitive bids.

* ***Competitive Bids***

✓ Specify price and quantity desired.

✓ Minimum $10,000 & in multiples of $5,000 above $10,000.

✓ Mostly professionals - dealers & banks.

✓ No more than 35 percent of an issue is sold under the competitive bidding process in order to ensure a competitive secondary market.

* ***Non-competitive Bids***

🗸 All non-competitive bids accepted.

🗸 Specify quantity only.

🗸 Maximum $5,000,000.

🗸 Mostly individuals & small businesses.

🗸 Accept the yield resulting from the auction.

* Participants in Treasury Direct program are book-entry accounts.

***D.* *Book-entry Securitie****s*

1. No physical securities: only record entries.

2. Book-entry record keeping only since 1976

3. Most of marketable Treasury debt is now in book entry form.

**IV. Federal Agency Securities** - Issued federal agencies whose job is to promote credit flows into disadvantaged sectors of the economy (originally agriculture and housing).

***A.* *Types of Federal Agencies (See Exhibit 7.7)***

1. Farm credit agencies - loans to farmers.

a. Federal Land Bank (1916) - Twelve banks providing agricultural credit

b. Federal Intermediate Credit Banks (1923)

c. Bank of Cooperatives (1933)

d. The financial crises of the farm sector threatened system. Farm Bill of 1985 strengthened federal implicit guarantees.

2. Housing credit agencies - loans and secondary market support for mortgage market. Other agencies - special purposes.

3. Federal Financing Bank - purchases securities of agencies and issues its own obligations.

***B.* *Short-term Issuers***

1. Bonds

a. Coupon

b. Advance notice needed before sale.

2. Discount notes

a. Sold at a discount; redeemed at par.

b. May be sold by agency without advance notice on a continuous basis.

***C.* *Characteristics of Agency Debt (See Exhibit 7.8)***

1. Most are not guaranteed by federal government; federal guarantee is implicit, not explicit.

2. Marketability varies with the development of the secondary market.

3. Yields are higher than T-Bills.

a. Greater default risk

b. Lower marketability

**V. Negotiable Certificates of Deposit** - Major Source of Funds for Large Money Center Banks

***A. Characteristics of Negotiable CDs***

1. Large denomination time deposit, less than six month's maturity

2. Negotiable - may be sold and traded before maturity

3. Issued at face value with coupon rate. Interest computed on a 360 day year.

4. Primary market sales have CDs of denominations of at least $100,000.

5. Secondary market deals are for $1 million or more.

6. Interest rates on CDs are higher than on T-Bills because they carry a higher credit risk, as well as, lower marketability and higher taxability.

***B. Development of the CD Market***

1. First ***negotiable*** CD issued by Citibank in 1961

2. Offset declining demand deposits as a source of funds

***C. The NCD Market***

1. Rate negotiated between buyer and seller.

2. Market is sensitive to rates above or below the market rates.

3. Rates are lower for money center banks and are tiered upward for regional banks.

4. Purchased mainly by corporate businesses (70% to 80% of all NCDs issued)

a. Seek liquidity and income

b. Maturity related to needs of corporate bank customers

c. May be sold prior to maturity

**VI. Commercial Paper**

***A. Characteristics of Commercial Paper***

1. Short term - one to 270 days

2. Unsecured

3. Large denominations - $100,000 and up

4. Issued by high-quality borrowers

5. A wholesale money market instrument – no individual investors

6. Sold at a discount from par – similar to T-Bill bank discount yield

7. Directly or dealer sold

8. Backed by bank lines of credit

***B. History of Commercial Paper***

1. One of the oldest money market securities - started in early 1800s.

2. Rapid growth as finance companies grew in post WWII.

***C. The Commercial Paper Market***

1. Major investors

a. Originally banks, now . . .

(1) Insurance companies

(2) Non-financial business firms

(3) Bank trust departments

(4) State and local pension funds

2. Banks are involved.

a. Backup lines of credit

b. Act as agents in issuance

c. Hold notes in safekeeping

d. Facilitate payments

3. Credit ratings are available for commercial paper.

4. Backup lines of credit from banks support or guarantee quality.

5. Placement

a. Directly by a sales force of the borrowing firm

(1) Mostly by large financial institutions

(2) Save dealer's commission

b. Indirectly through dealers

(1) Dealers issue and make a market

(2) Not as liquid as negotiable CDs

**VII. Bankers' Acceptances –** Used in international trade

***A. Characteristics of Bankers' Acceptances***

1. Time draft - order to pay in future

2. Drafts are drawn on and/or accepted by commercial bank.

3. Direct liability of bank

4. Mostly relate to international trade

5. Secondary market - dealer market

6. Discounted in market to reflect yield

7. Standard maturities of 30, 60, or 90 days - max of 180

***B. History of Bankers' Acceptances***

1. Oldest money market instrument - twelfth century

2. Developed in the U.S. with international trade and beginning of the Federal Reserve System in 1913

3. Foreign banks and non-bank financial institutions are the most important investors, followed by domestic banks

***C. Creating a Banker's Acceptance (See Exhibits 7.10 & 7.11)***

1. Importer initiates purchase from foreign exporter, payable in future

2. Importer needs financing; exporter needs assurance of payment in future

3. Importer's bank writes irrevocable letter of credit for exporter

a. Specifies purchase order

b. Authorizes exporter to draw time draft on bank

4. Importer's bank accepts draft (liability to pay) and creates a banker's acceptance

5. Advantage of a banker's acceptance (BA)

a. Exporter receives funds by selling BA in the market

b. Exporter eliminates foreign exchange risk

c. Importer's bank guarantees payment of draft in future

***D. The Market for Banker’s Acceptances***

1. Limited number of market participants - originators and dealers

2. Large denominations - small transactions may be grouped

**VIII. Federal Funds**

***A. Characteristics of Federal Funds***

1. Interbank loans = market for depository institutions

2. Most liquid of all financial assets

3. Related to monetary policy implementation

4. Yields related to the level of excess bank reserves.

5. Originally a market for excess reserves - Now a source of investment (***federal funds sold***) and continued financing (***federal funds purchased***).

6. Most are one-day, unsecured loans

7. Bookkeeping Entry, Interest Paid Separately

8. Traded in Immediately Available Funds

9. Transaction size is typically $1,000,000 or more

***B. Growth in Fed Funds Market***

1. Small banks accumulate balances to sell the excess reserves to their correspondent banks which in turn consolidate for investment in the fed funds market.

2. Non-bank financial institutions such as S&L’s, foreign banks, or government securities dealer have become suppliers of funds in this market.

**IX. Repurchase Agreements (Repo)**

***A. Characteristics of the Repo***

1. Security sold under agreement to repurchase at given price in future

a. Method used by banks to effectively pay market interest rate on deposits to corporate customers

b. Specific bank investments are designated in sale

2. Way to include corporate business in Federal Funds market

3. Negotiated market rate

4. The interest rate on repos is ***lower*** than the fed funds rate, since repos are backed by securities (usually T-bills, T-bonds, or federal agency debt).

5. The repo is used as a source of funds (***liability***) by borrowers who sell securities with the agreement to buy them back as well as a use of funds (***asset)*** by investors with excess funds who buy the securities with the agreement to sell them back ***– Reverse Repo.***

***B. The Market for Repurchase Agreements***

1. Repos are used by the Federal Reserve in open market operations.

2. Government securities dealers use repos to secure funds to invest in new Treasury issues.

3. Banks participate in the repo market to secure funds to meet temporary liquidity needs as well as lend funds when they have excess reserves.

**X. The Relationship of Money Market Interest Rates (See Exhibit 7.13)**

A. Money market rates of various instruments fluctuate closely with one another.

1. Money market instruments are close substitutes.

2. Investors hold a variety of money market securities.

B. Interest Rate Arbitrage - Selling one security and buying another keeps yield differentials among money market securities consistent.

**COMPLETION QUESTIONS**

1. The money markets are distinct from other financial markets in that they are \_\_\_\_\_\_\_\_\_ markets because of the large transactions involved.

2. Money market securities are standardized debt obligations which provide investors with \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_.

3. Large commercial banks dominate the money market with money market instruments appearing on both sides of the balance sheet. List the money market assets and liabilities of large commercial banks and their parent bank holding companies.

Assets Liabilities

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. The money market is comprised of \_\_\_\_\_\_\_\_ who issue and make a market in the securities.

5. The Federal Reserve System conducts \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ in the money market by buying and selling money market securities from dealers and thus affecting the level of bank \_\_\_\_\_\_\_\_.

6. A non-financial corporation may be involved in the money market as an investor by buying \_\_\_\_\_\_\_\_ and as a borrower by issuing \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.

7. Federal agency securities have higher yields than T-Bills because they have less \_\_\_\_\_\_\_\_ and more \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ because there is no explicit government guarantee of the debt.

8. Money market instruments are either \_\_\_\_\_\_\_\_ issues paying a specific rate of interest, or they are sold on a \_\_\_\_\_\_\_\_ basis, below face value.

9. Because the minimum \_\_\_\_\_\_\_\_ traded in the market is rather large, many small investors invest in the money market by buying \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.

10. Commercial paper is sold two ways: \_\_\_\_\_\_\_\_ by large finance companies, or underwritten by \_\_\_\_\_\_\_\_.

**TRUE-FALSE QUESTIONS**

T F 1. Many diverse institutions borrow in the money markets, while relatively few invest.

T F 2. Commercial banks purchase commercial paper by issuing backup lines of credit.

T F 3. Interest arbitrage keeps the interest rates of the many money market securities equal.

T F 4. Banker’s acceptances are bank liabilities.

T F 5. A repurchase agreement is a secured obligation.

T F 6. The money market is a market where liquidity is bought and sold.

T F 7. Competitive bids in T-bill auctions require the bidder to specify only the quantity desired.

T F 8. Dealers bring buyers and sellers together; brokers make a market.

T F 9. Much of the added yield (relative to T-bills) required by investors in federal agency issues is attributed to the higher default risk.

T F 10. Treasury bills are sold on a discount basis, with interest paid separately at maturity.

**MULTIPLE-CHOICE QUESTIONS**

1. The money market security with the lowest yield to the investor is likely to be

a. a Treasury bill.

b. commercial paper.

c. agency issues.

d. negotiable CDs.

2. All of the following represents a characteristic of money market instruments *except*:

a. low default risk

b. guaranteed marketability

c. debt obligation

d. short term

3. The fed funds rate is very important to the economy because:

a. it measures the return on the most liquid of all the financial assets traded

b. it is closely related to the conduct of monetary policy

c. it measures directly the availability of excess reserves in the banking system

d. all of the above

4. ***All*** of the following money market participants are major investors in money market securities ***except***:

a. Federal Reserve banks.

b. the U.S. Treasury.

c. commercial banks.

d. corporate business.

5. A ***competitive*** bid in the Treasury securities auction market has all of the following characteristics ***except***

a. the bidder specifying the quantity of bills desired

b. the price the investor wishes to pay

c. large, institutional investors

d. bids for a maximum of $5,000,000

6. A ***reverse*** repurchase agreement calls for

a. a firm to first sell securities with the agreement to buy them back in a short period at a higher price.

b. a firm to first buy securities with the agreement to sell them back in a short period at a higher price.

c. a firm to first sell securities with the agreement to buy them back in a short period at a lower price.

d. a firm to first buy securities with the agreement to sell them back in a short period at a lower price.

7. Which of the following money market securities is usually not likely to be found on a commercial bank's balance sheet?

a. commercial paper

b. Treasury bills

c. certificates of deposit

d. bankers' acceptances

8. Money market securities have very little

a. default risk.

b. price risk.

c. marketability risk.

d. all of the above

9. Calculate the ***holding period return*** on a 52-day T-bill selling for 98.555% of its face value.

a. 10.85%

b. 10.75%

c. 10.54%

d. 10.29%

10. The bank discount rate on a $100,000 face value T-bill priced at $97,500, maturing in 181 days is:

a. 4.84%

b. 4.97%

c. 5.10%

d. 5.17%

**SUPPLEMENTARY ASSIGNMENTS**

**FINDING MONEY MARKET STATISTICS**

A. Using the following sources, list the current rates for several money market securities. What are the yield differences between T-bills and other instruments? (Make sure the term or maturity is the same.)

"Treasury Bonds, Notes and Bills", The Wall Street Journal

"Government Agency Issues", The Wall Street Journal

"Money Rates", The Wall Street Journal and Barrons

"Banxquote Online Deposits”, The Wall Street Journal (Bank rates)

"U.S. Financial Data", Federal Reserve Bank of St. Louis (rates are plotted weekly)

"Monetary Trends", Federal Reserve Bank of St. Louis, monthly (money and capital market rates are plotted for five years)

"Interest Rates: Money and Capital Market", from "Financial and Business Statistics," Federal Reserve Bulletin, Monthly.

B. Update Exhibit 7-1 "Money Market Instruments Outstanding" using the Federal Reserve Bulletin and Flow of Funds Accounts, Assets and Liabilities Outstanding (annual).

C. From the Quarterly Flow of Funds Accounts, "Open Market Paper," note and support two ideas:

1. Discuss the major changes (flows) in open market paper in the last five years.

2. What factors may explain the major changes (flows) in the question above?

D. Instruments of the Money Market, Federal Reserve Bank of Richmond, c/o Publications; Richmond, VA 23261. This is an excellent resource and is available online under their publications list at <http://www.rich.frb.org/pubs/>.

**SOLUTIONS TO COMPLETION QUESTIONS**

1. money; a few; many; safety and liquidity with income

2. safety; marketability or liquidity; and income

3. **Assets Liabilities**

Federal Funds sold Federal Funds sold

Treasury bills Negotiable CDs

Agencies Bankers' acceptances

Securities Securities

purchased/resold sold/repurchased

Commercial paper Commercial paper (bank

Bankers' holding companies)

acceptances Fed discount window borrowing

Eurodollar borrowing

4. dealers

5. open market operations; reserves

6. Bank CDs, T-Bills or other MM securities; commercial paper

7. marketability; default risk

8. coupon; discount

9. denomination; money market mutual funds

10. directly; dealers

**SOLUTIONS TO TRUE-FALSE QUESTIONS**

1. F Only a relatively few "finance" in the market; many more invest.

2. F Commercial banks support the credibility of the commercial paper market by pledging to backup the paper if needed by extending loans to the paper issuers to pay off investors.

3. F There is a difference in default and marketability risks among money market securities and thus the yields differ. Interest arbitrage (buying/selling) keeps the yields in reasonable proximity.

4. T The commitment to pay the trade acceptance is "accepted" by the bank.

5. T Specific securities are sold or purchased and serve as collateral for the obligation.

6. T Liquidity is stored and sought (borrowed) in the money market.

7. F Both the quantity desired and the bid price need to be specified.

8. F Dealers own (take a position) and buy/sell (make a market) on a bid/ask basis. Brokers bring buyers and sellers together for a trade.

9. F Most of the yield differential is related to marketability differences.

10. F Treasury securities are sold at a discount off the face value and appreciate to the face value at maturity. No additional interest is paid.

**SOLUTIONS TO MULTIPLE-CHOICE QUESTIONS**

1. a T-bills have the lowest default risk and the best secondary market (marketability).

2. b While most instruments have some secondary market or a buy-back option, it is not guaranteed.

3. d All three factors are important to gauge the economy and the state of liquidity in the banking system and the fed funds rate in rate will dictate borrowing and lending decisions of businesses, consumers and other borrowers.

4. b The U.S. Treasury borrows, and borrows, and borrows!

5. d Institutional investors in the new Treasury issue market make bids to purchase Treasury securities in excess of $1,000,00 and usually to the tune of several million dollars.

6. b. A firm(the lender) will first buy securities with the agreement to sell them back (to the borrower) in a short period at a higher price. The higher price includes the payment of interest on the secured loan.

7. a Commercial paper is least likely, relative to the other answers, to be found on a commercial bank balance sheet; however, bank holding companies issue commercial paper, so one will find commercial paper liabilities on consolidated bank and bank holding company statements.

8. d Money market securities have minimal risk.

9. d. The holding period return may be calculated as follows:



10. b The bank discount rate on a $100,000 face value T-bill priced at $97,500, maturing in 181 days is:

