Treasury Management

Course 2079

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2019 Session
What you can expect this week

Day 1 A discussion of treasury management, liquidity management, cash forecasting, fraud management – detection/prevention

Day 2 A discussion of time value of money, determining yields on investments, short-term investments, debt management and short term investing strategies.

Day 3 A discussion of the U.S. payments system, collection processes, disbursement processes and technology in treasury management and banking.

Day 4 A discussion of risk management and hedging in treasury operations to include futures, forwards, swaps and options (as well as a course review and a discussion of the home study project/study problems.)
Tips for Success in this Class

1. Whenever I ask for a cost, I generally mean for it to be expressed as a **RATE**, not in $$$.
2. Hi-lite, bold or underline **final answer** to a problem.
3. **Calculate interim steps** w/o rounding to get to a final answer.
4. Any calculations you are asked to do on the home study project, the intent is to **calculate them as we discussed in class**.
5. Answer **all parts** of a question (A, B, C...)

**REMEMBER THESE TIPS FOLKS!!!**

Who is the single most powerful person in the U.S. when it comes to control of the U.S. financial system?
Treasury Management – Day 1

- Role of Treasury
- Typical Treasury Functions
- Treasury Management
- Liquidity and How to Manage It
- Cash Forecasting Process

Role of Treasury

- Ensure adequate liquidity for the enterprise
- Manage daily cash flows for the enterprise
- Optimize use of cash resources
- Procure cost-effective short term financing
- Assess, monitor and minimize risk(s)
- Produce timely and accurate short to medium term liquidity forecasts
- Manage bank/financial relationships
- Manage information – LOTS OF INFORMATION
Typical Treasury Functions

- Borrowing activities
- Buy vs. lease analysis
- Investor Relations

- Collection/Concentration of Funds
- Disbursements
- Short term investing
- Financial institution administration

- Interest rate volatility
- Insurance
- Foreign exchange volatility
- Employee Benefits Funds Management

Develop an Understanding of the Following

- What is treasury management?
- Why treasury management?
- Major Objectives of Treasury Management
- How treasury management interacts with the company’s business cycles
- Basic treasury management concepts
- What is liquidity management?
What is Treasury Management?

- The efficient utilization of current assets and current liabilities of a firm throughout each phase of the business operating cycle.
- The systematic planning, monitoring and management of the company collections, disbursements and cash balances.
- The gathering of and management of information to use available funds effectively and to identify risk.
Why Treasury Management?

Because of the variability of cash flows:
Cash flows are
Cash flows are
Cash flows are
Cash flows are
The treasury manager balances the company's borrowing and investing activity to maintain the minimum level of liquidity required to sustain the company through the various cycles of business.

Major Objectives of Treasury Management

- Maintaining liquidity
- Optimizing cash resources
- Establishing and maintaining access to short-term financing
- Maintaining access to medium- and long-term financing (capital budgeting)
- Maintaining shareholder relations
- Managing risk
- Coordinating financial functions and sharing financial information
Treasury Management Model

Operating, Cash Flow and Accounting Cycles

Operating Cycle

Cash Flow Cycle

Accounting Cycle
Treasury Linkages and Interfaces

**Intra**
corporate Integration

- Purchasing
- Investment Borrowing
- General Ledger
- Risk Mgmt.

**Intra**
corporate Integration

- A/R
- A/P
- Pension Mgmt.
- Internal Audit

**Inter**
corporate Integration

- Financial Markets
- Customers
- Industry Trade Groups
- Regulatory Agencies

- Banks
- Suppliers
- External Investment Mgmt.
- External Auditors

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Daily Cash Management

**Daily funds management**

- Prepare cash position worksheet.
- Monitor cash balances.
- Mobilize funds.
- Research and reconcile exception items.
- Coordinate finance functions with A/R, A/P and accounting.

**Banking system administration**

- Liquidity management
- Forecasting
- Systems design, implementation and evaluation
- Financial risk management
Treasury Management Concepts

1. Float
2. Availability
3. Finality
4. Time value of money
5. Opportunity cost
6. Idle balances
7. Risk management

1. ___________ – Delays in the process of collection, concentration or disbursement.
   - Increases in float are to the benefit of the disbursing party (___________)
   - Decreases in float are to the benefit of the receiving party (___________)
   - Depending or the context and circumstances of the transaction, every Treasury Manager is both a payor and payee of funds.
2. __________ – Refers to the time until the funds become “usable” to the depositor.
   - Availability can vary from immediate to three or four business days.
   - Banks develop availability schedules that determine the length of time customers must wait until they can used deposited funds based on where the check is drawn that was deposited.
Treasury Management Concepts

3. ______________ – Refers to the point in time at which deposited funds become irrevocable and may not be returned without the prior consent of the beneficiary.
   
   – For large transactions, finality is often more important than availability.
     
     • Wires become available and final upon confirmation of receipt of the wire by the Fed.
     
     • Checks may become available but not until several days later as they can be debited back to the account if rejected by the drawee bank.
     
     • ACH credits are final upon posting.

4. ______________ – Refers to the concept that cash has a higher value if received today rather than tomorrow. This concept is important to Treasury Managers in making a number of decisions:
   
   – Determining the cost/benefit of a cash management product
   
   – Assessing the value of cash discounts
   
   – Investing surplus funds
Treasury Management Concepts

5. ________________ – Refers to the cost of a forgone alternative use of funds.
   - Relevant in evaluating a sub-optimal situation in comparison to implementing changes toward achieving an ideal solution.
   - Measured as the cost of the alternative use of funds (i.e., lost investment income when there are idle balances in an account or the cost of early or missed payments.)

Treasury Management Concepts

6. ________________ – Sometimes referred to as transaction balances, these are funds in a bank account that are not earning interest.

   This is an ____________ cost.

While idle balances are a bankers friend (free money!!), a capable Treasury Manager will ensure this issue does not arise with accounts for which they have responsibility.
7. ________________ – "...The practice of creating economic value in a company by using financial instruments to manage exposure to different types of financial risk..."

Financial risk management focuses on when and how to hedge (or minimize the various types of risks) using financial instruments to manage costly exposures to risk.
What is Liquidity?

"...the ability or ease with which assets can be converted into cash..."
"...available cash or the capacity to obtain it on demand...
"...being in cash or easily convertible to cash; debt paying ability..."
Why Liquidity Is Needed

Requirements

Requirements

Requirements

Cash Forecasting
Objectives of Cash Forecasting

- Liquidity management
  - Schedule investment maturities
  - Anticipate borrowing requirements
- Meeting strategic objectives
- Capital budgeting
- Financial control and risk management
- Managing currency exposure

Degrees of Certainty

- Known in advance (e.g., interest costs, debt principal repayments, dividends, royalties and tax payments)

  Can be predicted with reasonable accuracy; prediction of future cash flows can be made based on past observations (e.g., cash collections from credit sales, payroll and clearing of vendor checks)

- Difficult to forecast; involves experience and judgment (e.g., new product sales, unexpected repairs and claims and strike settlements)
Forecasting Liquidity

The most commonly used forecast process for businesses is the receipts and disbursements forecast. It is comprised of a schedule of predicted cash inflows and outflows. Combining the inflows and outflows with beginning cash balances provides a projected cash position.
Fraud Management/ Detection & Prevention

Fraud/Prevention Management Optimizing Risk and Friction

The quest: Optimizing the balance between risk and friction

Level of security:
- High
- Medium
- Low

Seamless experience

High friction
Fraud/Prevention Management

Synthetic Fraud

A true-life example of synthetic identity fraud

Data from the credit bureau TransUnion shows a typical case of a nefarious individual profiting from multiple synthetic identities.

True-life example of synthetic identity fraud

One fraudster, multiple synthetic identities

<table>
<thead>
<tr>
<th>Profile 1</th>
<th>Profile 2</th>
<th>Profile 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 associated accounts, including cards, auto loans, collections, and visas</td>
<td>1 collections account</td>
<td>9 associated accounts, including credit cards, auto loan, and collections</td>
</tr>
<tr>
<td>$17k lent, $16k delinquent</td>
<td>$18k past due</td>
<td>$16k lent, $6k delinquent</td>
</tr>
<tr>
<td>Total Loss $14k</td>
<td>Total Loss $14k</td>
<td>Total Loss $197k</td>
</tr>
</tbody>
</table>

Synthetic identity fraud is growing rapidly

US Synthetic Credit Card Fraud, 2015 to 2020 (in US$ millions)

- 2015: $580
- 2016: $701
- 2017: $820
- 2018: $968
- 2019: $1,133
- 2020: $1,257

Source: Aite Group
A million children working, earning and borrowing before being born?

The young couple joyfully welcomed their first child in May. A new life, a fresh start. Or so they thought.

After they filed that year's taxes listing their new little dependent, the IRS notified them that their infant had an earnings and credit history going back five years.

Mom and Dad were taken aback, because their little one could barely pull himself up by the rails of his crib.
Fraud In Hermiston, America

Black Market Value of PII

- Credit Card: $87
- Date of Birth: $11
- Medical Insurance: $20
- Email Account: $129
- Bank Account: $300
- Complete Identity: $1,200

Fraud In Hermiston, America

An honest to goodness real life fraud attempt in the small town of Hermiston, Oregon

---
From: [Redacted]
To: [Redacted]
Subject: Direct Deposit Update
Attachments: Direct Deposit Form-15.pdf
Importance: High

---
From: [Redacted]
To: [Redacted]
Subject: Direct Deposit Update
Attachments: Direct Deposit Form-15.pdf
Importance: High

---
@hermiston.or.us wrote:
* You can send me the updated banking info using the attached. Or I can switch you to a paper check until it gets figured out.

---
From: [Redacted]
To: [Redacted]
Subject: Direct Deposit Update
Attachments: Direct Deposit Form-15.pdf
Importance: High
Fraud In Hermiston, America

Direct Deposit Agreement form:

City of Hermiston

Authorization Agreement

I hereby authorize (s) of the amount in excess of account balance to be deposited in the account on the date this authorizations is endorsed from the account. The amount that exceeds the account balance

Is this a real bank?

Is this a valid transit routing number?

Fraud In Hermiston, America

EMPOWERING

What bank routing number is 033101169?

International Money Transfers

Prefix/Routing

Routing Number: 033101169 The leading instructions routing number

Banks

Office Code: 0 Main office

Routing ID number: 0033101169 Servicing fields main office routing number

People who ask:

Do Saxony Bank accept wire transfers?

What city is Saxony Bank in?

What is the e-wallet code for Saxony Bank?

What bank routing number is 033101169?
Fraud In Hermiston, America

MAR 20, 2019

PRESS RELEASE

Today, the Umatilla County Sheriff’s Office took a report of a card skimmer incident from the Accept Age store on Hwy 327 near Hermiston. Store personnel found a fake device attached to one of their card readers next to a register inside the store. They do not know how long the skimmer has been there or if anyone was affected.

The fake device, which consists of a clear screen, keyboard, and a duplicate keypad, was placed on top of the card reader and was affixed with double-sided tape. It looks authentic. On the backside of the device are electronic components, including a battery and a device that reads the magnetic strip on a credit/debit card. The keypad could capture pin numbers as the customer types their pin number. Please see the attached photos below.

We would like to alert people who have purchased items at the Accept Age store recently to check their bank accounts for any suspicious activity and contact their bank. Please contact our office if you have any information, or have experienced a theft.

These card skimmers are becoming more and more sophisticated. They look authentic, and can be placed virtually anywhere. Protect yourself by monitoring the reader for signs of tampering or anything that looks out of place before using it. Examine the card reader device and keypad for alterations, cracks, dents or other damages, different colors on the machine, and dents or tape or glue. Use a credit card with a chip, which are less likely to be skimmed. If you have one...

For further information on how to spot and avoid card skimmers, see this article from PC Magazine:

https://www.pcmag.com/how-to-spot-and-avoid-card-skimmers
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**GSB**
GRADUATE SCHOOL of BANKING
AT LOUISIANA STATE UNIVERSITY

Treasury Management - Day 2

- Time Value of Money
- Short Term Financing
- Short Term Investing
Question

What are the distinctions between money and capital markets?

Generally have one year or less to maturity. They are highly liquid, short-term securities issued by borrowers with excellent credit status. Examples: T-bills, commercial paper ("CP"), repurchase agreements ("repos"), etc.

Generally more than one year to maturity. They are less liquid and are issued by entities of various credit quality. Examples: term loans, corporate bonds, municipal bonds, etc.

Securities and Exchange Markets

- ___________markets: Debt and equity offered for first time to investors
- ___________markets: Previously issued debt and equity are traded by brokers and bankers

- NYSE
- AMEX
- NASD
- NASDAQ (national over-the-counter exchange)
- Regional exchanges

- Continuous market with frequent fast trading reducing price volatility
- Prices subject to changing supply and demand
- Companies raise capital
- Regulated environment
What Is Time Value of Money?

is determining either present value (PV) or future value (FV) of an investment.

is today's value of any sum that is expected to be received in the future.

entails scheduling all relevant cash flows (both inflows and outflows) associated with a project.

is the value at some point in the future of a sum of money invested today.
Time Value of Money

The value of cash flow is determined by the:

Present Value

Present value is today’s value of any sum that is expected to be received in the future.

The process of calculating the present value of a cash flow is also known as discounting.

Discounting facilitates comparison of alternative transactions with cash flows that are expected to be received at a future date or dates.

Present value may be used to determine how much an investor would be willing to pay for an investment that provides a particular future stream of cash flows.

\[ PV = \frac{FV}{(1 + i)^n} \]
Present Value Example

Hot 100, Inc. has been offered an investment that will provide a cash flow of $1,000,000 at the end of 3 years. Other investments with the same level of risk are earning 8%. What is the maximum price that Hot 100 should pay for this investment?

\[
PV = \frac{FV}{(1 + i)^n}
\]

\[
PV = \frac{1,000,000}{(1 + 0.08)^3} = \frac{1,000,000}{(1.08) \times (1.08) \times (1.08)}
\]

\[
PV = \frac{1,000,000}{1.2597} = 793,839.80
\]

Net Present Value ("NPV")

NPV is mostly used in Capital budgeting as the process by which strategic plans are developed and assessed to determine a company’s investment in capital assets.

- Examples include the expansion of existing facilities, purchase of new equipment, replacement of existing equipment, and the introduction of new produce lines.
- **Net Present Value** is one decision model used for capital budgeting.
- The decision rule for the NPV model is to accept a project if the NPV is greater than or equal to zero. If the NPV is negative, the project should be rejected.
Net Present Value Example

The treasurer of Hot 100, Inc. is evaluating the replacement of some existing production equipment. The initial cost of replacing the existing machinery will be $15,000,000. Due to increased production efficiency and flexibility, the incremental cash flows generated by the replacement are expected to be $3,000,000 in the first year, $6,000,000 in year 2, $6,000,000 in year 3, and $4,000,000 in year 4. There are no expected benefits after the fourth year. Given that Hot 100's cost of capital is 10.36%, calculate the project's NPV?

\[
NPV = \sum_{t=0}^{n} \frac{C_t}{(1 + i)^t} = C_0 + \frac{C_1}{(1 + i)^1} + \frac{C_2}{(1 + i)^2} + \ldots + \frac{C_n}{(1 + i)^n}
\]

Net Present Value Example

\[
NPV = \sum_{t=0}^{n} \frac{C_t}{(1 + i)^t} = C_0 + \frac{C_1}{(1 + i)^1} + \frac{C_2}{(1 + i)^2} + \ldots + \frac{C_n}{(1 + i)^n}
\]

NPV = -15,000,000 + \frac{3,000,000}{(1 + 0.1036)^1} + \frac{6,000,000}{(1 + 0.1036)^2} + \frac{6,000,000}{(1 + 0.1036)^3} + \frac{4,000,000}{(1 + 0.1036)^4}

NPV = -15,000,000 + 2,718,376.22 + 4,926,379.53 + 4,463,917.66 + 2,696,579.47

NPV = ($194,747.12)

(or a loss 1.239831% of investment)
**Future Value**

The **future value** of an investment is the value at some point in the future of a sum of money invested today.

______________ assumes that any periodic payments received from an investment are reinvested at the same rate.

\[ FV = PV \times (1 + i)^n \]

---

**Future Value Example**

What is the future value of $50,000 invested at 6% for 4 years?

\[ FV = PV \times (1 + i)^n \]

\[
FV = 50,000 \times (1 + 0.06)^4 = 50,000 \times (1.06)^4 = 50,000 \times 1.26248 = 63,124
\]

\[ FV = \$50,000 \times 1.26248 = \$63,124 \]
Weighted Average Cost of Capital (WACC)

Cost of capital can be measured by the combined cost of equity and cost of debt. What is the WACC of a company with a:

- Capital structure of 45% debt to 55% equity
- Marginal tax rate of 33%
- Cost of debt of 11.5%
- Cost of equity of 15%?

\[
\text{WACC} = (\text{After-tax Cost of Debt} \times \% \text{ of debt}) + (\text{Cost of Equity} \times \% \text{ of Equity})
\]
\[
= [0.115 \times (1-0.33) \times 0.45] + (0.15 \times 0.55)
\]
\[
= (0.0771 \times 0.45) + 0.0825
\]
\[
= 0.0347 + 0.0825
\]
\[
= 0.1172, \text{ or } 11.72\%
\]

Note: The debt is adjusted by the amount of the tax rate because interest is a tax-deductible expense. The after-tax cost of debt is calculated by multiplying the cost of debt times one minus the marginal tax rate.

Short Term Financing
The Five C’s of Credit

- Perceived honesty or integrity of the applicant
- Current and future financial resources that can be committed to pay obligations
- Short- and long-term financial resources to supplement insufficient cash flow for payments
- Assets or guarantees available to secure an obligation if payment is not made
- General economic environment and economic conditions for the customer and the seller

Short Term Financing Objectives

The objective of short term financing is to ensure adequate credit availability at:

The amount and timing of short term financing can be determined through cash forecasting. The cost of borrowing depends on the type of credit facility used.
Factors Influencing Financing Costs

A determinant of interest rate
A reflection of the company’s overall creditworthiness
A third-party guarantee of the borrower’s debt obligations
The life span of the debt instrument

Short Term Financing Alternatives

Trade Credit – This financing method arises when a buyer receives goods but payment is not made until some later date. The cost of this type of credit ("annualized trade credit") can be calculated.

Annualized Cost of Trade Credit = \frac{\text{Disc.} \%}{(100 - \text{Disc} \%)} \times \frac{365}{(\text{Net Terms} - \text{Disc. Terms})}
Cost of Trade Credit Example

Tropical Palms, Inc. has received an invoice with credit terms of 3/15, net 60. The company’s cost of borrowing is 9.5%. Should Tropical Palms borrow and pay on day 15, or skip the discount and pay on day 60?

Annualized Cost of Trade Credit = \( \frac{\text{Disc. \%}}{(100 - \text{Disc \%})} \times \frac{365}{(\text{Net Terms} - \text{Disc. Terms})} \)

Annualized Cost of Trade Credit = \( \frac{3}{(100 - 3)} \times \frac{365}{(60 - 15)} \)

Annualized Cost of Trade Credit = \( \frac{3}{(97)} \times \frac{365}{(45)} \)

Annualized Cost of Trade Credit = 0.0309 \times 8.1111 = 0.2509 = 25.1\%

Short Term Financing Alternatives

Factoring – Refers to the outright sale of a company’s accounts receivable /invoices to a third party. The sale of the A/R is, in effect, a proxy for a short-term loan. The receivables are sold at a discount to the “factor.” The firm receives a % of the total receivables at the time of the sale, and the remainder of the A/R invoice amount (less the factoring discount) when the invoices are collected.

Advantages of factoring:
- Cash flow from the sales of receivables grows automatically with an increase in sales.
- Cost of maintaining a credit dept. is reduced/eliminated.
- Uncertainty in timing of payments is reduced.
- Range of customers to whom credit can be extended is greater.

Disadvantages of factoring:
- High fees could be charged, especially in without recourse agreements.
- Seller loses control over the credit granting decision.
- Factoring is now a standard practice in industries that have a long cash conversion cycle (such as furniture manufacturing and the garment industry.)
Short Term Financing Alternatives

Line of Credit ("LOC")—Refers to an agreement in which the lender gives the borrower access to funds up to a maximum amount for a specific period of time.

- LOCs are usually revolving.
- LOCs frequently include clean-up periods and material adverse condition (MAC) clauses.
- LOCs can be secured or unsecured.
- LOCs can be committed or uncommitted.
- Compensating balances might also be utilized with an LOC to “buy” down the rate.

Line of Credit Cost Example

Tropical Palms, Inc. is considering a $5,000,000 line of credit for liquidity purposes. Over the year, the average loan amount outstanding is expected to be $1,400,000. The line of credit will have an interest rate of LIBOR + 1.50%, and the bank will charge a commitment fee of 12.5 basis points on the unused portion of the line. What is the effective annual borrowing rate if LIBOR is 3.0%?

\[
\text{Effective Annual Borrowing Rate} = \frac{\text{Total Interest} + \text{Total Commitment Fees Paid}}{\text{Average Usable Funds Borrowed}}
\]
Line of Credit Cost Example

Effective Annual Borrowing Rate = \( \frac{\text{Total Interest} + \text{Total Commitment Fees Paid}}{\text{Average Usable Funds Borrowed}} \)

Total Interest Paid = Average Borrowing x All-In Rate

Total Interest Paid = 1,400,000 x 0.045 = $63,000

Total Commitment Fee = Average Unused Portion of Line x Commitment Fee

Total Commitment Fee = 3,600,000 x 0.00125 = $4,500

Effective Annual Borrowing Rate = \( \frac{63,000 + 4,500}{1,400,000} = \frac{67,500}{1,400,000} \)

Effective Annual Borrowing Rate = 0.0482 = 4.82%

Short Term Financing Alternatives

Commercial Paper – Commercial paper ("CP") is a short term, unsecured promissory note issued in the money markets.

- Often the least expensive available source of short term debt for creditworthy companies with large, ongoing short term funding requirements.
- Limited to a maximum of _________________________
- Many times CP issues have a backup line of credit in order to repay the CP in the event it cannot be rolled over or paid off at maturity.
- CP is issued at a discount, therefore proceeds to the issuer are less than the face amount of the issue.
- Other costs associated with a CP issue might include dealer fees, rating agency fees and credit enhancement costs.
Commercial Paper Example

The Pinnacle Corporation issued $40,000,000 of commercial paper with a 60-day maturity at a discount of 2.7%. The annual dealer fee was 20 basis points and the fee for the back-up line of credit was 25 basis points. What was the effective annual interest cost for the commercial paper?

\[
\text{Effective Annual Interest} = \frac{\text{Discount + Dealer Fee + Backup Fee}}{\text{Usable Funds}} \times \frac{365}{\text{Days to Maturity}}
\]

Discount = Discount Rate \times \text{Face Amount} \times \frac{\text{Days to Maturity}}{360}

Discount = 0.027 \times 40,000,000 \times \frac{60}{360} = $180,000

Usable Funds = \text{Face Value} - \text{Discount} = 40,000,000 - 180,000 = $39,820,000

Prorated Dealer Fee = \text{Annual Dealer Fee} \times \text{Face Amount} \times \frac{\text{Days to Maturity}}{360}

Prorated Dealer Fee = 0.0020 \times 40,000,000 \times \frac{60}{360} = $13,333

Prorated Backup Credit Fee = 0.0025 \times 40,000,000 \times \frac{60}{360} = $16,667

Effective Annual Interest = \frac{180,000 + 13,333 + 16,667}{39,820,000} \times \frac{365}{60}

Effective Annual Interest = \frac{210,000}{39,820,000} \times \frac{365}{60} = 0.0321 = 3.21\%
Short Term Investing

Why Companies Hold Short-Term Investments

Reserve liquidity
Temporary surplus funds
  • Ongoing operations
  • Asset sales
  • Seasonal performance
Minimize foregone interest income
Short-Term Investment Objectives

Investment Policy

Must address key issues:
- Establish criteria for security selection and portfolio configuration and risk tolerance
- Delineate individual responsibilities for developing the policy
- Implement the policy on a day-to-day basis
- Require periodic review of investment performance, broker performance and compliance with investment policy guidelines
Credit / Default Risk

Risk that payments on a security will not be made under the original terms
Credit evaluation assesses default likelihood
Credit ratings based on default risk, seniority and any collateral
  • Moody’s
  • Standard and Poor’s (S&P)
  • Fitch (not so much anymore)
Credit enhancement

Liquidity Risk

Risk a security cannot be sold quickly without taking a significant loss

• Existence of active secondary market?
• Unrated securities may not be liquid; must perform credit analysis

• Date on which obligation is settled
• Holding investments over longer time periods increases price risk
Market / Price Risk

Uncertainty over the price at which a security can be sold prior to maturity

- Threat that interest rates may rise during holding period of fixed-rate security
- Intent or necessity to sell prior to maturity

- Risk of change in FX rates between currency of security and home currency

- Risk of having to invest proceeds from an investment maturity or sold security at a relatively lower return

Short Term Investment Strategies

This strategy involves leaving idle collected balances in the corporate bank accounts. Since the bank uses the earnings from these idle balances to offset service fees this approach can be viewed as the equivalent of a modest rate of return for the enterprise.
Short Term Investment Strategies

This strategy involves purchasing securities that mature when funds are required to meet an expected obligation or obligations.

- This practice allows companies to invest for extended periods and potentially increase yields.
- Companies utilizing this strategy tend to do so conservatively, covering a portion, but not the entire amount, of the expected capital need.

Short Term Investment Strategies

This strategy calls for establishing a pattern of rolling maturity dates for a portfolio of relatively short-term fixed-income investments.

- A laddered portfolio hedges interest rate changes by providing liquidity with relatively short-term securities while at the same time providing a relatively steady source of income with relatively longer-term, fixed-income investments.
- For example, an investor with $50,000 might invest $10,000 in bonds with a six month maturity, $10,000 in bonds with a one year maturity, $10,000 in bonds with an eighteen month maturity, and so forth.
Short Term Investment Strategies

This strategy involves buying highly liquid marketable securities (such as T-bills) that mature on a date different from when the investor intends to sell the securities.

- When the yield curve is normal (upward sloping), an investor purchases securities that mature beyond the time period when the funds are needed. Then the securities are sold prior to maturity.
- When the yield curve is inverted (downward sloping), an investor purchases securities for shorter than the time period when funds are needed, reinvesting the funds when the first set of securities mature.
- The overall risks in this strategy are that interest rates may rise or fall further than expected or the yield curve may shift.

Yield Curves

% Yield

Maturity

Normal Yield Curve

% Yield

Maturity

Inverted Yield Curve
Determining Investment Pricing/Yields

Taxable Equivalent Yield – The *tax status* of an investment *affects its yield*. Tax-exempt securities provide a lower pre-tax yield than taxable securities of similar maturity and default risk.

- This calculation is used to compare tax-exempt instruments and their yields with other taxable investment alternatives.

\[
\text{Taxable Equivalent Yield} = \frac{\text{Tax - Exempt Yield}}{(1 - \text{Marginal Tax Rate of Investors})}
\]

Taxable Equivalent Yield

The city of Slapout, Oklahoma has issued municipal bonds with a yield of 4.4%. Your firm is evaluating these securities as a possible investment. The firm’s marginal tax rate is 36%. Taxable bonds with similar maturity and default risk are yielding 6.0%. Should the firm invest in the municipal bonds?

\[
\text{Taxable Equivalent Yield} = \frac{4.4}{(1 - 0.36)} = \frac{4.4}{0.64} = 6.875\%
\]
Determining Investment Pricing/Yields

**Annual Yield** — Yields are quoted on an annualized basis that is obtained by adjusting the holding period yield for the number of days to maturity

- The two most commonly quoted yields that are calculated using the annual yield formula are the money market yield and the bond equivalent yield.
- The *money market yield* uses a 360-day year basis and the *bond equivalent yield* uses a 365-day basis.
- A *commercial paper nominal yield* uses a 365-day year basis.

\[
\text{Annual Yield} = \frac{\text{Holding Period Yield} \times \text{Days in Year}}{\text{Days to Maturity}}
\]

---

**Annual Yield Example**

A bond is currently selling at a price of $1,000. The bond will repay the face value of $1,000 plus $40 in interest at maturity. Given that the bond matures in 180 days, calculate the annual yield using a 360-day year basis.

\[
\text{Holding Period Yield} = \frac{1,040 - 1,000}{1,000} = 0.04 = 4.0\%
\]

\[
\text{Annual Yield} = \text{Holding Period Yield} \times \frac{\text{Days in Year}}{\text{Days to Maturity}}
\]

\[
\text{Annual Yield} = 0.04 \times \frac{360}{180} = 0.08 = 8.0\%
\]

**This yield can be converted to a 365-day year basis as follows:**

\[
365 - \text{Day Basis Yield} = 360 - \text{Day Basis Yield} \times \frac{365}{360}
\]

\[
365 - \text{Day Basis Yield} = 0.08 \times \frac{365}{360} = 0.0811 = 8.11\%
\]
Determining Investment Pricing/Yields

Discount — Discount instruments (such as Treasury bills and commercial paper) are typically quoted using a discount rate.

- The discount rate is used to calculate the dollar amount of the discount from face value, and the price is the face value minus the amount of the dollar discount.

Discount = Discount Rate \times \text{Face Amount} \times \frac{\text{Days to Maturity}}{360}

Purcha ce Price = \text{Face Amount} - \text{Discount}

Discount Calculation Example

What is the purchase price of a 60-day Treasury bill, with a face value of $100,000, and a discount quote of 3.4%?

Discount = \text{Discount Rate} \times \text{Face Amount} \times \frac{\text{Days to Maturity}}{360}

Discount = 0.034 \times 100,000 \times \frac{60}{360}

Discount = 3,400 \times 0.1667 = $566.67

Purchase Price = \text{Face Amount} - \text{Discount}

Purchase Price = 100,000 - 566.67

Purchase Price = $99,433.33
Determining Investment Pricing/Yields

Money Market Yield — The money market yield on a discount instrument (T-bill or commercial paper) is calculated using the annual yield formula with a 360-day year basis.

\[
\text{Money Market Yield} = \frac{\text{Discount}}{\text{Purchase Price}} \times \frac{360}{\text{Days to Maturity}}
\]

Money Market Yield Example

What is the money market yield for a 60-day Treasury bill, with a face value of $100,000, and a discount quote of 3.4%? (This is the same T-bill that is used in the prior example.)

Money Market Yield = \frac{\text{Discount}}{\text{Purchase Price}} \times \frac{360}{\text{Days to Maturity}}

\[
\text{Discount} = 0.034 \times 100,000 \times \frac{60}{360} = 566.67
\]

\[
\text{Purchase Price} = 100,000 - 566.67 = 99,433.33
\]

\[
\text{Money Market Yield} = \frac{566.67}{99,433.33} \times \frac{360}{60} = 0.0057 \times 6
\]

\[
\text{Money Market Yield} = 0.03419 = 3.419\%
\]
Determining Investment Pricing/Yields

**Bond Equivalent Yield** – The bond equivalent yield on a Treasury-bill (or any other discounted instrument) is calculated using the annual yield formula and a 365-day year basis.

\[
\text{Bond Equivalent Yield} = \frac{\text{Discount}}{\text{Purchase Price}} \times \frac{365}{\text{Days to Maturity}}
\]

---

**Bond Equivalent Yield Example**

What is the bond equivalent yield for a 60-day Treasury bill, with a face value of $100,000, and a discount quote of 3.4%? (This is the same T-bill that is used in the prior examples.)

\[
\text{Discount} = 0.034 \times 100,000 \times \frac{60}{360} = 566.67
\]

\[
\text{Purchase Price} = 100,000 - 566.67 = 99,433.33
\]

\[
\text{Bond Equivalent Yield} = \frac{\frac{566.67}{99,433.33}}{\frac{365}{60}} \times 0.005699 \times 6.083
\]

\[
\text{Bond Equivalent Yield} = 3.467\%
\]
The "Rule" of Pricing Yields

The Bond Equivalent Yield is

The Money Market Yield is

The Discount Rate

---

Short-Term Investment Markets and Instruments

Market for debt and equity
- **Money market** for short-term debt securities
  - Group of over-the-counter markets
  - Very large and efficient
- **Capital market** for longer-term debt and equity instruments (stocks and bonds)
  - Sometimes in short-term portfolio directly or via mutual funds

Virtually all short-term securities issued in book-entry form
- Registered and transferred electronically by U.S. Treasury (treasury securities only) or commercial book-entry system
Money Market Participants

- Treasury bills/notes & Federal agency and Government Sponsored Enterprise ("GSE") securities
- Bank issues
- Commercial Paper ("CP")
- Municipal notes and "CP"
- Money market mutual funds
What you can expect this week

Day 1  A discussion of treasury management, liquidity management, cash forecasting, fraud management – detection/prevention

Day 2  A discussion of time value of money, determining yields on investments, short-term investments, debt management and short term investing strategies.

Day 3  A discussion of the U.S. payments system, collection processes, disbursement processes and technology in treasury management and banking.

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Tips for Success in this Class

1. Whenever I ask for a cost, I generally mean for it to be expressed as a **RATE**, not in $\$$.
2. Hi-lite, bold or underline **final answer** to a problem.
3. **Calculate interim steps** w/o rounding to get to a final answer.
4. Any calculations you are asked to do on the home study project, the intent is to **calculate them as we discussed in class**.
5. Answer **all parts** of a question (A, B, C...)

**REMEMBER THESE TIPS FOLKS!!!**

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**GRADUATE SCHOOL OF BANKING AT LOUISIANA STATE UNIVERSITY**

Treasury Management - Day 3

- U.S. Payments System
- Collection Processes
- Disbursement Processes
- Technology in Treasury Management and Banking
U.S. Payments System

The Federal Reserve System (the "Fed")

Organization:
- Board of Governors
- Federal Open Market Committee (FOMC)
- 12 banks and 25 branches of the Federal Reserve

Roles:
- Supervision and regulation
- Set monetary policy
- Banking services' wholesaler
- Fiscal agent of the U.S. Treasury
- Consumer protection
The Federal Reserve System (the "Fed")

Federal Reserve Banks

Question

Which component of the Fed has the most impact on monetary policy and why?
Five Reasons Digital Money (Virtual Currency) Will Not Replace Cash In a Payments System

- 
- 
- 
- 
- 
- 

Deadlines and Deposit Timing

- Defines the start and end of a banking day
- The time of day when a deposit must be received to be posted to the depositor’s account
- Established by individual banks

- The time of day, based on an item’s drawee endpoint, by which an item must be at the depository bank’s processing center ready for transit in order to qualify for the availability stated on that bank’s availability schedule
**Funds availability**

- **Balances**: All entries to a bank account, regardless of whether the deposited items have been collected and are available for withdrawal.

- **Balances**: The dollar amount in an account for which the bank of deposit has received settlement.

- **Balances**: Amount of funds available for withdrawal from an account — they are equal to the sum of:
  - collected balances
  - balances scheduled to be collected by the end of the business day
  - those additional amounts for which availability must be granted under Reg CC

---

**Payment Systems Costs**

- Potential for excess borrowing costs
- Potential for lost investment income
- Cost of missing a payment
- Cost of a late payment
- Cost of making a payment early

- Fixed costs (account maintenance, balance reporting)
- Variable costs (checks paid, reconciliation, stop payments, zero balance transfers)
## Payment Systems Risk

<table>
<thead>
<tr>
<th>Failure of one bank potentially causing other banks to fail and the potential of a collapse of the entire banking system</th>
</tr>
</thead>
<tbody>
<tr>
<td>The party funding a transaction defaults on its settlement obligation</td>
</tr>
<tr>
<td>- Account holder daylight overdrafts</td>
</tr>
<tr>
<td>- ODFI has credit exposure from ACH file release until settlement</td>
</tr>
<tr>
<td>- Presented items exceed funds in account</td>
</tr>
<tr>
<td>Altered transactions or false items that could cause a loss for the disbursing party</td>
</tr>
</tbody>
</table>

## Paper Payment System

![Image of a check with annotations](image)

1. (1)  
2. (2)  
3. (3)  
4. (4)  
5. (5)  
6. (6)  
7. (7)
The MICR Line of a Check

1) __________
2) __________
3) __________
4) __________
5) __________
6) __________

The Check Clearing Process

- **Presentment** is the delivery of a "check" to the paying bank (which can happen in a number of ways)
- Value is subtracted from the payor's bank's account with a Federal Reserve bank (the "Fed"), a correspondent bank or some other clearing institution
- Normally funds are also deducted from the payor's account on the same day
Check Clearing Process

Role of the ____________ Bank

- Receives checks for credit to its customer's accounts
- Bank images each check deposited & verifies validity of check images
- Images of checks are sorted by appropriate paying bank to make a file for transmission
- Files then transmitted for clearing

Check Clearing Process

Role of the ____________ Bank

- Responsible for inspecting the check for alterations, appropriate dating, stop payments and positive pay instructions
- Also review account for active status, adequate funds, and holds
- Drawee bank has until midnight local time on the banking day following presentment to conduct a review of the check and authorize final payment
Question

How do you define the term "commercial bank"?

Deposit Accounts

Checking account
Can be interest-bearing for virtually any entity: individuals, sole proprietorships, government entities and nonprofits, and corporations
Purposes for holding balances:
– Transaction balances
– Compensating balances
– Correspondent balances

Must be held for specified period
CDs (under $100K)
Jumbo CDs (over $100K)
Fully negotiable CDs ($1 million blocks)
Savings accounts
MMDAs
NOW accounts
Usually penalties assessed for early withdrawals
Collections Processes

- Major objectives of collections systems
- Lockboxes
- ACH system
- Credit card and card systems
- Wire transfer systems (FedWire)
- Concentration systems
Major Objectives of a Collection System

- To collect receivables in a cost-effective manner.
- To convert collections into available funds as rapidly as possible.
- Provide accurate and timely information on cash flows, levels of bank balances and availability of funds.
- Updating accounts receivable records promptly and accurately.
- Provide audit trails for the institution’s internal and external auditors.

Deposit Checks by Phone

Nearly two-thirds of mobile bankers would be likely to deposit checks by phone, especially the young

- 18-25 years old: 61%
- 26-34: 66%
- 35-44: 69%
- 45-54: 41%
- 55-64: 38%
- 65 and older: 13%
- All respondents: 59%

Source: Mercatus
Lockboxes

What’s the difference in Remote Deposit Capture (RDC) and check conversion?

Check ________ transforms a check to electronic settlement.

Check ________ transforms a check into an image-enabled electronic transaction for settlement.

Checks have been and will still be governed by the Uniform Commercial Code (UCC) provisions.

The consumer must receive notice that a check they write will be converted to an ACH item so they can pay some other way if they choose to do so.

Check conversion via POS, ARC and BOC are governed by Reg E and NOT the UCC.
Components of Collection Float

-------------------------- float: Interval between the time a check is mailed and the date it is received by the payee or at the processing site

-------------------------- float: Interval between the time the payee or processing site receives the check and the time the check is deposited at a financial institution.

-------------------------- float: Interval between the time a check is deposited and the time a company’s account is credited with collected funds.

Mail Processing Systems

Company Lockbox Processing
- Company does its own processing and deposit preparation.
- Typically used for a large volume of relatively small-dollar amounts.

3rd Party Lockbox Processing
- A third party receives payments at a specified lockbox address, processes the remittances and deposits them in the payee’s account.
- Can be electronic, paper-based or a combination of the two
Types of Lockboxes

------- Lockbox

Provider receives, processes and deposits company’s receipts via P.O. box (possibly with a unique ZIP)
- Receipts usually processed in a **highly automated** fashion
- Usually **small dollar**, consumer-to-company (retail) payments
- A **standard remittance advice** typically accompanies payment
- Information provided to customer in **standard report format** (magnetic tape, disk or transmission) to allow for rapid update of company’s receivables
- **High volume** of payments (compared to wholesale lockbox)
- **Minimizing processing costs** is determining factor, not float

------ Lockbox

Lockbox receives, processes and deposits company’s receipts via P.O. box (possibly with a unique ZIP)
- Receipts typically processed in a **manual** fashion
- Usually **large dollar**, company-to-company payments
- **No standard remittance** advice accompanies payment
- Information provided to customer in **unique, customer specific formats** (typically)
- Very **labor intensive**
- **Low volume** of payments (compared to retail lockbox)
- **Minimizing collection float** is primary consideration
Types of Lockboxes

Lockbox

Has attributes of both retail and wholesale lockbox -- payments are processed manually and automatically

- Payments received with and without remittance advices
- Manual intervention is required for larger dollar payments with non-standard characteristics
- Data capture process must be flexible and varied -- usually customized
- Requires combination of data input for delivery of information to customer for account updating
- Dollar volume of payments varies widely
ACH Systems – The Players

- The Originator
- The Originating Depository Financial Institution (ODFI)
- The ACH Operators(s)
- The Receiving Depository Financial Institution (RDFI)
- The Receiver

ACH Systems Overview

ACH Credit Transaction (Credit “PUSH”)

ODFI Information Flow RDFI

Originator ACH Operator(s) Receiver

$$_$$
ACH Systems Overview

ACH Debit Transaction (Debit “Pull”)

ODFI  Information  Flow  RDFI

Originator  ACH Operator(s)  Receiver (provided an authorization)

$\$\$

ACH Systems Update

Same Day ACH
- Credits launched September, 2016
- 75.1 million transactions through year-end 2017
- $87.1 billion in value
- Debits launched September, 2017
- Implemented funds being available by 5:00 PM local time, March, 2018
- Studying increasing transaction $ amount to $100,000 for same day processing

ACH System
- Reviewing possibility of later processing windows
- Exploring processing on weekends and bank holidays
Credit Card and Card Systems

Anatomy of an electronic purchase

START!
The consumer makes a purchase

.5 SEC.
Bank sends the Card brand authorization

1.3 SEC.
Bank sends the decision back to the merchant, it is either approved or denied

1 SEC.
The system sends the receipt to the consumer's bank

FINISH!
1.7 SEC.
Card brand authorization is completed

.76 SEC.
Bank sends the receipt to the consumer's bank

Less Than 2 SEC.

Courtesy of Elavon
Card Payment/Collections

- Credit cards/Debit cards
- Procurement cards (P-cards)
- Offline Debit cards
- Online Debit cards
- Smart Cards
  - Stored value cards
  - Security/Access card function
- Payroll cards
- Electronic benefit transfers and payroll cards
Wire Transfer Systems

Wire Transfer Security

- Physical security and limited access
- **Passwords** and personal identification numbers (PINs)
- Test keys and codes to validate wire transfers
- Repetitive wires to limit where and to whom funds can be transferred
- Dual approval
  - Electronic security measures (e.g., encryption, message authentication and digital certificates)
- Security devices or keys
Wire Transfer Overview

FedWire

An institution that maintains an account at a Federal Reserve bank is generally allowed to be a participant in FedWire.

- Transfers originated in 2018
- Dollar Value of those transfers
- Average value per wire
- Average daily volume of wires
- Average total daily value of wires

Wire Transfer Overview

Types of FedWires

- wire
  The only information that can vary is the due date and the amount.
- wire
  All information may vary except the sending and receiving parties.
- wire
  All information may vary.
- wire
  Request to a sending bank for an incoming transfer.
- wire
  Request to transfer funds whenever account balances reach a designated level or threshold.
Concentration Systems

Objectives of a Cash Concentration System

- Minimize "field" bank balances
- Pool funds in one account
- Facilitates daily liquidity management
- Allows for the active investment of more funds to increase income
- Pay debt down faster/reduce interest expense
- Take advantage of vendor discount terms
Concentration Methods

- **Electronic Deposit Transfers** ("EDTs") and wire transfers are most frequent.
- Field offices, field banks, headquarters or concentration banks can originate EDTs.
- Some large retail networks transmit information from **POS terminals** to headquarters.
- **Repetitive wires** used for large dollars for same-day value and finality.
- Local managers/headquarters can initiate wires or field bank may have standing instructions.
- Could use a **drawdown wire**.
- Multiple branches of a single bank
  - **ZBAs**

---

Disbursement Processes
Disbursement Products

Controlled disbursement
Zero balance account (ZBA)
Payable through draft (PTD)
Positive Pay/Payee Positive Pay

Controlled Disbursement

- A bank service providing notification of the dollar amount of checks that will clear against a controlled disbursement account that day.
- Daily clearings usually available by early or mid-morning.
- Adequate funds must then be provided to the account to cover the value of the checks presented.
Zero Balance Account (ZBA)

- Disbursement account on which a company issues checks, ACH debits or wires—even though the account balance is kept at zero.
- A transfer of funds from a master account (usually located in the same bank) covers checks debited against a ZBA for payment.
- May be multi-tiered so multiple divisions or subsidiaries can write checks on separate accounts, all funded by a master account.

Positive Pay/Payee Positive Pay

- Used to combat check fraud
- Company transmits file of check information to the disbursement bank.
- Bank matches numbers and amounts and only pays matches.
- Reverse positive pay
- Payee Positive Pay
- Fraud that cannot be prevented
  - Fraudulent endorsement
  - Holder in due course
Electronic Disbursement Methods

- ACH credit origination
  - Direct deposit
  - Vendor payables
- Purchasing/procurement cards
- Tax payments

Trends in Payment Systems
Trends in Payment Systems

1. Gen Z Rising – 1/3 of Gen Z consumers want to share their payments on social media while only 3% of Baby Boomers would. (P2P)

2. The ties that bind customers to traditional payments players are fragile at best. ("I want to use any mobile app and see it now.") (UX)

3. 23% of consumers would give up their mobile banking app for a digital wallet with all their payments information in one place.

4. Consumers want more and more – and still more – in rewards and are willing to switch cards to get it.

5. The power of "the network" is essential to win the future of payments, meaning that "collaboration" is back in vogue.

6. Innovation in payments could lose is luster without fintechs and banks partnering.
Trends in Payment Systems

7. Everyone can be a merchant – and every device can be an acceptance advice. (Venmo, Stripe, Square, PayPal, etc.)
8. Fraudsters (criminals) are making it their full time job to “out-innovate” the payments industry. (Identity theft/impostering efforts are growing/evolving)
9. Traditional payments players cannot survive without a complete overhaul of existing systems.

Real Time Payments ("RTP")

September, 2017 – Zelle Network & Banking
But we already have Same – Day ACH!
Bad assumption that Zelle is only for P2B, P2P
RTP optimized for B2B, but also for P2P, P2B
“My customers don’t want to pay faster…”
How to charge for RTP transactions?
Real Time Payments ("RTP")

If you are a smaller bank, one option is to connect directly to any of the faster payment networks offered by a larger financial institution that provides both network connectivity and operational servicing.

Your bank can then focus on designing and promoting your "customer value proposition."

Maybe begin with "receive only" implementation.

(You can always enhance with initiation later.)
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Risk Management: Hedging and Speculation
Using Futures, Forwards, Swaps, Options
Instant Polling of the Class

Poll Everywhere Slides
What does Speculation Mean to YOU
Make up definition of speculation with the real definition as the right one

Develop an Understanding of the Following

- The risk management process
- What "derivatives" are and how they are used to manage risk in the enterprise
- Uses of Forwards (and an example)
- Uses of Futures (and an example)
- Uses of Swaps (and an example)
- Uses of Options (and an example)
- Review of the week's discussions
Risk Management Process

- Determine risk attitude/tolerance
- Identification of the exposure
- Measuring the exposure(s)
- Implementing the appropriate risk management strategy
- Monitoring the exposure and evaluating the strategy

Instruments Used In Risk Management

- Futures, forwards, swaps and options are all derivatives
- A derivative "derives" its value from an underlying instrument
- The underlying asset can be a financial instrument, a currency or a commodity
- There are four basic types of derivatives: Forwards, Futures, Swaps and Options
Forwards

A forward contract is a **private, customized** agreement between two parties to buy or sell a fixed amount of an asset to be delivered at a future date for an agreed upon price today.

The following are characteristics of a forward:

- The future date to settle is referred to as the **“maturity”** date.
- The price is called the **“delivery”** price.
- The **purchaser** of the forward is one party and the other participant is the **“counterparty”**.
- Party buying the asset is said to be in a **“long”** position.
- The **“long”** position **gains value** when the underlying asset price rises and **loses value** when the asset price falls.
- Party selling the asset is said to be in a **“short”** position.
- The **“short”** position **gains value** when the underlying asset price falls and **loses value** when the asset price rises.

Forward – An Example

- U.S. importer needs to pay an invoice in GBP 50,000 in 90 days.
- The importer purchases a forward contract today for GBP quoted at 1.69 USD/GBP, deliverable in 90 days.
- At the end of 90 days, importer pays USD 84,500 (USD 1.69 x GBP 50,000) and receives GBP 50,000 to pay the invoice.
- The forward locked in the price of GBP to pay the invoice no matter what fluctuations occurred in the exchange rate during the 90 days leading up to the deliverable date.
Forward Contract - Long Position
(payoff from a long forward)

Profit

Asset Price

Forward Contract - Short Position
(payoff from a short forward)

Profit

Asset Price
Futures

A futures contract is similar to a forward contract in the sense the payoff profile from a long position and a short position in a futures contract look exactly the same.

- The main difference between the two is that futures are standardized contracts traded on organized exchanges (Chicago Board of Trade, Chicago Mercantile Exchange, New York Mercantile Exchange as examples).
- Futures contracts are standardized and have a range of delivery dates.
- Futures trading requires the existence of a “margin account” that is “marked to market” on a daily basis.
- Futures contracts are rarely settled by delivery and are usually closed out prior to maturity.

Swaps

A swap is an agreement between two parties to exchange (or swap) a set of cash flows at a future point in time.

- An interest rate swap is the most common type of swap.
- A currency swap is an agreement to convert an obligation in one currency to an obligation in another currency.
- Commodity swaps involve the exchange of a floating price for a commodity for a fixed price.
Example of An Interest Rate Swap Between Fred and Barney

Funds borrowed

Lender ← Fred
4.25% interest paid by Fred to lender
Net Interest Rate Paid by Fred

Barney → Lender
LIBOR + 1% interest paid by Barney to lender
Net Interest Rate Paid by Barney

Options

An option is a contract between two parties in which the buyer of the option has the right (but not the obligation) to either buy or sell a fixed amount of some underlying asset at a fixed price on or before a specified date.

- Party offering the option is called the writer of the option.
- Options may be either exchange-traded or negotiated with a specific counter-party.
- Exchange-traded options share many of the same characteristics of futures contracts.
Options (cont.)

- A **call option** gives the owner the right to **buy** the underlying asset at a fixed price.
- A **put option** gives the owner the right to **sell** the underlying asset at a fixed price.
- The fixed price is the "strike" or "exercise" price of the contract.
- The specified date is the "maturity" or "exercise" date of the contract.
- The **seller** of the option ("writer") receives a premium from the buyer. In return, the "writer" has the obligation to fulfill the contract if the **holder** chooses to exercise the option.

Options (cont.)

There are five possible payoff scenarios with options:

- An **option is at-the-money** if the underlying asset price is equal to the strike price of the option.
- A **call option is out-of-the-money** if the asset price is less than the strike price of the option.
- A **call option is in-the-money** if the asset price is greater than the strike price of the option.
- A **put option is out-of-the-money** if the asset price is greater than the strike price of the option.
- A **put option is in-the-money** if the asset price is less than the strike price of the option.
Payoff from a Long (Buy) Call

Investor buys 3-month call option on crude oil – strike price of $40/bbl. Investor pays a $2 premium. If at maturity, market price < or = $40/bbl, does not exercise the option. If at maturity, market price > $42/bbl the investor makes a profit.

Payoff from a Long (Buy) Put

Investor buys 1-month put option on crude oil – strike price of $35/bbl. Investor pays a $1 premium. If at maturity, market price > or = $35/bbl, does not exercise the option. If at maturity, market price < $34/bbl the investor makes a profit.
Commodity Exposure

Results from changes in the price of a commodity used or sold
- Rising prices for a commodity used creates exposure.
- Declining prices for a commodity sold creates exposure.

Occurs when regular supply of a commodity is crucial
Can be mitigated by entering into a long-term agreement with a producer

Interest Rate Options

Interest rate options are options in which the payoff depends on the level of interest rates. There are three basic types of interest rate options:

- **Interest rate option**
  - ________ ensure that the borrower of a floating rate loan receives a ceiling rate if interest rates rise above a specified level (the ________ rate.)
  - The price of this insurance is the premium paid for the ________.

- **Interest rate option**
  - ________ ensure that the owner of a floating rate asset receives a ________ rate if interest rates fall below a specified level.

- **Interest rate option**
  - The price of this insurance is the premium paid for the _________. A company that buys a cap and sells a floor is effectively locking in a range of borrowing rates.
  - A ________ has no cost when the income received from the sale of the floor matches the premium paid for the cap.
Interest Rate Exposure

Falling rates with variable interest rate investments may mean ____________

Rising rates with debt tied to variable interest rates may mean ____________

Course Review

Things you should probably know for the exam tomorrow

Remember the "good to knows" in our discussion over the last four days of the material.
Tips for the Home Study Problems

**YOU** decide how much time and effort you want to expend on the home study problems.

Tips for the Home Study Project

How your final project answers looks (grammar, layout, format, organization, etc.) **DOES MATTER**.

The only format requirements that apply are what the GSB guidelines for case submission say they are – be as creative or innovative as you want to be (within those guidelines).

You shouldn’t have to use any more than four pages to complete your project.

If you have any questions, send me an e-mail – you probably won’t get me on the phone.
Home Study Problem **DON'TS**

**DON'T** do any kind of binding of the proposal.

**DON'T** use more than 6 pages (at least try.)

**DON'T** re-state the problems, it just wastes paper.

**DON'T** "fluff" your answers (this means no B.S.)

**DON'T** write a letter with your answers.

**DON'T** use any color – only black and white.

**DON'T** wait until October to do these problems.

**DON'T** ignore the directions for the problems.

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How To Reach Me

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