

Globalization and the Multinational Enterprise and Financial Goals and Corporate Governance

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OUTLINE OF CHAPTERS 1-2

- ◆ What is the goal of the firm in different countries
- ◆ What is a Multinational firm

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Multinational Enterprises

- ◆ This course concentrates on the financial operations of all firms
- ◆ More emphasis is placed on multinational firms (firms with operating units in more than one country) than small domestic firms. Multinationals include both manufacturing as well as service firms.

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Goal of the Firm

- ◆ Goal - Maximize Shareholder Wealth
 - ❖ maximize Capital Gains and Dividends taking into account risk
 - ❖ A company's stock price is very important (incorporates all relevant information)
- ◆ This goal applies in the Anglo-American World [U.S., U.K., Canada, Australia and New Zealand]

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Goal in Continental Europe and Japan – Stakeholder Capitalism Model

- ◆ Maximize Corporate Wealth (not only stockholder wealth but also wealth of managers, labor, local community, suppliers and creditors).
- ◆ Wealth not just financial wealth but also the firm's technical, market and human resources

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Conclusions - Goals

- ◆ There are different goals in different countries.
- ◆ What we believe in the U.S. is not necessarily followed in other countries
- ◆ There appears to be a trend toward more use of the shareholder wealth maximization model.

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Ownership Structures

- ◆ In the U.S. and U.K. there is relatively widespread ownership of shares and management owns often only a small part of the total number of shares.
- ◆ In other parts of the world there are often controlling shareholders. Examples are families in Asia and institutions such as banks in Germany.

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Ownership Structures - Continued

- ◆ In many countries, controlling shareholders often have more power than their cash flow rights (for example, dual voting rights).

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Corporate Governance

- ◆ Protect shareholders' rights
- ◆ Protect minority as well as majority shareholders
- ◆ Help (protect) all stakeholders
- ◆ Foster timely and accurate disclosure of information
- ◆ Help the board of directors

- ◆ OECD statement

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Players in Corporate Governance

- ◆ Board of Directors
- ◆ Management
- ◆ Equity and Debt markets
- ◆ Auditors and Legal Advisors
- ◆ Regulators like the SEC

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Corporate Governance Around the World

- ◆ There are differences among countries in corporate governance practices and effectiveness
- ◆ Legal systems differ on protection of shareholder rights (common law more protection than civil law)
- ◆ Differences in laws regarding disclosure and how often information must be disclosed

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Efforts to Improve Corporate Governance

- ◆ Sarbanes-Oxley Act (SOX) – 2002
 - ❖ Signature Clause - CEOs and CFOs sign for financial statements
 - ❖ Corporate boards must have audit and compensation committees picked from independent directors

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SOX - Continued

- ◆ Companies cannot make loans to corporate directors
- ◆ Firms must test their internal financial controls for fraud
- ◆ Page 37 – Multinational Business Finance

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OUTLINE OF CHAPTER 3

- ◆ Understand the Bretton Woods System and the Current Exchange Rate System

- ❖ Bretton Woods

- Problems of the 1930's which lead to the creation of the system
- How exchange rates were determined
- Problems of the Bretton Woods system and attempts to save it

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OUTLINE CONTINUED

- ❖ Current system

- Special Drawing Rights
- Currency Arrangements

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Chapter 3 International Monetary System

- ◆ Formal Definition - Structure in which foreign exchange rates are determined, international trade and capital flows accommodated and balance of payments adjustments made.
- ◆ Going to concentrate on the history of exchange rate regimes starting with some problems in the 1930's

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Problems of the 1930's

- ◆ Some of the problems exist today though they tend not to be as severe.
- ◆ Delegates to the Breton Woods Conference in 1944 wanted to avoid/eliminate these problems

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Problem 1 - Competitive Devaluation

- ◆ Devaluation - Value of the currency is reduced
- ◆ In the 1930's countries suffered unemployment problems and some countries choose to devalue their currencies in the hope of creating exports and thus jobs

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Problem 1 - Continued Competitive Devaluations

- ◆ Other countries would respond by devaluing their currencies (would not want to see additional jobs lost in their countries)
- ◆ Net result - Currency values eventually would bear little resemblance to equilibrium values

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Problem 2 - Convertibility

- ◆ The currencies of many countries were either inconvertible or only partially convertible
- ◆ Convertible currency is one in which the holder can freely convert (no government license) to any other currency regardless of purpose or identity of holder

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Problem 2 - Continued Convertibility

- ◆ Examples of Partial Convertibility
 - a) current account (only "current" transactions okay)
 - b) non-resident convertibility (only non-residents can freely convert)

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Problem 3 - Exchange Control

- ◆ Government not the market allocates the foreign currency
- ◆ Under exchange controls, often the Government would support an overvalued currency and therefore it must ration out the foreign currency

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Breton Woods System 1944-1973

- ◆ Countries fix their value in terms of gold
- ◆ Made-up example
 - U.K. → 17.5 pounds /ounce of gold
 - U.S. → \$35 / ounce of gold
- ◆ Exchange rate \$2 / pound

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Breton Woods - Continued

- ◆ In reality, countries would fix the gold value of their currency after figuring out what they wanted the exchange rate to be
- ◆ Currencies required not to deviate more than +/- 1% from par value. Fixing the value of the currency should help with the problem of competitive devaluations

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Breton Woods - Continued

- ◆ The International Monetary Fund approval was needed for devaluations greater than 10%

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Breton Woods - Continued

- ◆ Two agencies were created along with the Breton Woods System
 - ❖ 1) International Monetary Fund (IMF) - Help countries with balance of payments and/or exchange rate problems
 - ❖ 2) International Bank for Reconstruction and Development (World Bank) - Designed to help post World War II reconstruction and now economic development

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International Monetary Fund

- ◆ IMF usually gives loans to help countries with exchange rate problems

- ◆ As a country borrows more and more, the IMF puts on additional restrictions which are often not popular with countries (infringement of sovereignty)

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IMF Borrowing

- ◆ Countries can borrow up to 150 % annually of their quotas, 450 % over a 3 year period, and 600 % cumulative

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IMF Quotas

- ◆ Quotas are paid in a) gold - 25 % and b) local currency - 75 %
- ◆ Quotas have increased over time
- ◆ They are based on economic size
- ◆ They also influence voting power

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Breton Woods System

- ◆ Over time problems of competitive devaluations, exchange controls, and convertibility have decreased
- ◆ Dollar became the hub of the system. It was the one currency required to be freely convertible into gold.

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Problems of the Breton Woods System

- ◆ 1) Short - Term Private Capital - the goal of these funds is to seek the highest yield. On balance, money would flow away from currencies expected to devalue. Sometimes if people expected a currency to devalue, it could become a self-fulfilling prophecy, even if the fundamentals did not warrant a change.

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Problems of the Breton Woods System - Continued

- ◆ 2) Reserves - not enough and no easy way to increase them along with the need to increase them
 - ❖ Types of reserves - 1) gold (increases in amounts are tied to new discoveries), 2) hard currencies, and 3) later SDRs
 - ❖ Dollar was a good reserve at first (stable and could get interest on them)

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Problems of the Breton Woods System - Continued

- ◆ 3) Dollar Became Overvalued
 - ❖ Since 1959, the U.S. had a deficit on its Balance of Payments
 - ❖ By the late 1960's and early 1970's , foreign countries had accumulated too many dollars
 - ❖ Since World War II, many countries had devalued relative to the U.S. dollar
 - ❖ Also due to the Vietnam War, the U.S. had higher rates of inflation relative to our competitors and thus our goods became overpriced

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U.S. Government Tried to Correct Balance of Payments Problems

- ◆ 1) Encouraged exports
- ◆ 2) Taxed U.S. residents buying foreign securities (interest equalization tax)
- ◆ 3) Voluntary and mandatory restrictions on both borrowing funds abroad and direct investment abroad

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U.S. Government Tried - Continued

- ◆ 4) intervened in the foreign exchange markets
- ◆ 5) Used various Swap Agreements

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Crisis in 1971

- ◆ By 1971 there were too many dollars overseas and countries had lost faith in the ability of the U.S. Government to convert them into gold
- ◆ On August 15, 1971, President Nixon suspended official sales of gold by the U.S. Treasury (in previous 7 months U.S. had lost about 1/3 of its official gold reserves)

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Crisis in 1971 - Continued

- ◆ At the same time, U.S. imposed wage and price controls and put a temporary 10% tax on imports coming into the U.S.

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Smithsonian Agreement

- ◆ December 17-18, 1971 dollar was officially devalued (from \$35 / ounce of gold to \$38) which was an 8.57 % devaluation
- ◆ Other countries also changed their values relative to gold so that for these countries the net changes in currency values were not 8.57 %
- ◆ Currencies could now fluctuate by +/- 2.25 % around these par values

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Crisis - February 12, 1973

- ◆ Dollar was officially devalued again (approximately 10 %) - Gold price now \$42.22 / ounce

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Crisis Continues

- ◆ By March 1973, fixed rates no longer appeared feasible
- ◆ Markets close for a couple of weeks
- ◆ Floating rate system begins when markets reopen

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Present Exchange Rate System

- ◆ Currencies are now floating in general as opposed to being fixed
- ◆ Definitions
 - ❖ Dirty Float - Government intervention
 - ❖ Clean Float - No government intervention
- ◆ Governments intervene to
 - ❖ Smooth out fluctuations
 - ❖ Influence rates (exports, unemployment, inflation)

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Jamaica Agreement - January 1976

- ◆ Provisions:
 - ❖ 1) Floating rates are now acceptable
 - ❖ 2) Countries can intervene to even out fluctuations due to speculation
 - ❖ 3) Gold was demonetized (link between gold and value of the currency cut)

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Jamaica Agreement - Continued

- ◆ 4) IMF sold gold. Some proceeds helped poorer countries
- ◆ IMF quotas changed. OPEC countries get more votes

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** Digression - Special Drawing Rights (SDRs) **

- ◆ International Reserve Asset
- ◆ Initially discussed in meeting in Rio de Janeiro in 1967
- ◆ Idea ratified in 1969
- ◆ By 1999, a total of SDR 21.4 billion allocated to member countries

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SDRs Continued

- ◆ Problems with other reserve assets
 - ❖ Dollar - too many of them "overseas"
 - ❖ Gold - Hard to have a steady increase and benefits would flow to Russia and South Africa (not our best friends in 1970)

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SDRs Continued

- ◆ Initial allocations made in 1970
- ◆ Each country could exchange SDRs for convertible currency and use the latter for example for intervention

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SDR Valuation January 11, 1996

Currency Amount	Exchange Rate	U.S. \$ Equivalent
\$.582		.582
DM .446	\$.6942/DM	.310
Yen 27.2	\$.009542/Yen	.260
FF .813	\$.2022/FF	.164
Pound .105	\$ 1.5445/pound	.162
Actual \$1.4802 / SDR		Total \$1.478/ SDR

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SDR Valuation January 14, 2002

Currency Amount	Exchange Rate	U.S. \$ Equivalent
\$.5770		.5770
Euro .4260	\$.8929 /Euro	.380375
Yen 21.0000	Yen 131.68 /\$.159478
Pound .0984	\$ 1.4496 /pound	.142641
		Total \$1.259494/ SDR

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SDR Valuation May 16, 2006

Currency Amount	Exchange Rate	Dollar Equivalent
\$.6320		.6320
Euro .41	\$1.2815/Euro	.525415
Yen 18.4	Yen 110.33/\$.166772
Pound .0903	\$1.8811/pound	.169863
Total		1.49405

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SDRs - Continued

- ◆ Countries do not have to accept SDRs from other countries in exchange for their currencies
- ◆ If they have extra SDRs
 - ❖ Will receive interest income
[current # of SDRs - allocated #] [interest rate]
- ◆ If a country often accepts SDRs from other countries it may find that other countries are willing to accept its SDRs

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Private Uses of SDRs

- ◆ Can have a checking account in SDRs
- ◆ Bonds may be denominated in them
- ◆ The IMF uses them as a unit of account
- ◆ ** End of digression **

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Currency Arrangements

- ◆ See pages 56-59

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Exchange arrangements with no separate legal tender

- ◆ Another currency serves as legal tender (for example, the U.S. dollar) or the countries adopt a new currency as legal tender (for example, the euro) which is used by all of the member countries of the monetary union

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Exchange Arrangements with no Separate Legal Tender - Continued

- ◆ Ecuador (January, 2000) and Panama (1907) use the U.S. dollar as their official currency
- ◆ Certain Western African countries use the Central African Franc (CFA) as their common currency. Senegal, Chad, and Cameroon are members of this group.

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Currency Board Arrangements

- ◆ A currency board has 3 parts (IMF Survey - May 24, 1999 page 171)
 - ❖ a fixed exchange rate to an anchor currency
 - ❖ automatic convertibility
 - ❖ a long-term commitment to the system, often set into law
- ◆ The central bank holds enough foreign exchange to cover the entire narrow money supply so that public will have confidence in the system

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Currency Board - Continued

- ◆ Often countries choose this option to fight inflation

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Peggers

- ◆ Peggers tie their currency to one or more currencies
- ◆ A number of smaller countries tie themselves to their leading trading partner because they would not want to see major economic changes caused by exchange rate changes

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Peggers - Continued

- ◆ Countries can tie their currencies to more than one currency such as the SDR or a basket determined by their trading or investment partners
- ◆ Baskets are usually less risky (less variation) and hence purchasing power would be more stable

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Other Conventional Fixed Peg Arrangements

- ◆ In this category exchange rates don't fluctuate much around a central rate (at most +/- 1% around a central rate)

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Pegged Exchange Rates within Horizontal Bands

- ◆ A similar to the previous arrangement except that the bands are wider than +/- 1%

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Crawling Pegs

- ◆ The exchange rate adjusts in small increments or to changes in various indicators (for example, inflation)

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Exchange Rates Within Crawling Pegs

- ◆ Similar to the previous group except that the exchange rate fluctuates within a band of a central rate

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Managed Floating with no Preannounced Path for the Exchange Rate

- ◆ Often the central banks intervene to support this rate

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Independently Floating

- ◆ Countries let the value of their currencies be determined by the market
- ◆ Most of the major currencies of the world are in this category with the exception of those currencies in the European Monetary Union
- ◆ The central banks of these countries may intervene occasionally (sometimes to limit variation)

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Summary

- ◆ The currencies of most countries are not floating. Only 80/186 countries are in the last two categories.

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European Economic Relationships

- ◆ Countries in Europe have desired closer economic relations among themselves where people, goods, services and capital can move “freely”
- ◆ An example of this relationship is the European Common Market which started in 1979

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Background of the European Monetary System

- ◆ Important treaty agreed upon in Maastricht, Netherlands in December, 1991
- ◆ Single currency (euro) and full European Monetary Union by 1999

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Criteria for Full Membership in the European Monetary Union

- ◆ Nominal inflation rates should be no more than 1.5% above the average for the three members of the European Union with the lowest inflation rates
- ◆ Long-term interest rates should be no more than 2% above the average for the three members with the lowest interest rates

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Criteria for Full Membership - Continued

- ◆ The fiscal deficit should be no more than 3% of the gross domestic product
- ◆ Government debt should be no more than 60% of gross domestic debt
- ◆ page 65, [Multinational Business Finance](#)

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Single Currency

- ◆ On January 1, 1999 the European Currency Unit became the Euro
- ◆ Also on January 1, 1999 the process of replacing national currencies within banks started

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Single Currency - Continued

- ◆ On January 1, 2002 Euro banknotes and coins started to circulate
- ◆ By February 28, 2002 national banknotes/coins were withdrawn from use (end of dual circulation period)

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Member countries of the European Monetary Union that use the Euro

- ◆ Baffling Pigs + [SCMSL] (Belgium, Austria, Finland, France, Luxembourg, Italy, Netherlands, Germany, Portugal, Ireland, Greece, Spain) + [Slovenia, Cyprus, Malta, Slovakia, and Lithuania]
- ◆ U.K. and Denmark do not have to use the Euro (opt-out clause).

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Member countries cont.

- ◆ Greece did not meet the initial requirements. Greece met the requirements in 2001.
- ◆ Slovenia started using Euro in 2007. Cyprus and Malta in 2008, Slovakia in 2009, and Lithuania in 2010.

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New Member States of the European Union (EU)

- ◆ The 10 new member states (Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia, and Slovakia) who joined the EU on May 1, 2004 did not automatically adopt the euro by joining the EU
- ◆ Bulgaria and Romania joined January, 2007
- ◆ They have to satisfy the “Maastricht” criteria first.

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Slovenia

- ◆ First country of the 10 member European Union accession class of 2004 to adopt the Euro.
- ◆ Passed the requirements to join. Inflation in 2001 was 8% in 2006 it was 2.3%. Labor unions helped keep the rate low.
- ◆ Dual circulation for 14 days – Slovene tolar and the Euro. After that just the Euro.

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Slovenia

- ◆ Fear of price increases after the adoption of the Euro. Some fear shop owners will use the adoption as an excuse to raise prices.
- ◆ Hopefully the adoption of the Euro will bring more stability (no exchange rate changes with the Euro), boost exports, and increase productivity gains (get more foreign direct investment).
- ◆ It seems to be a success so far.

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Euro

- ◆ Is a currency issued by the European Central Bank
- ◆ Its value does not depend on any other constituent currency. This is not true for the ECU or the SDR.

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Euro - Continued

- ◆ Initial value set at \$1.16675/€.
- ◆ Value of Euro Oct 2000 - \$.82/€
- ◆ Value July, 2008 - \$1.60/€
- ◆ Value as of January 16, 2009 - \$1.31/€

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In Euro Zone

- ◆ Cheaper transaction costs
- ◆ Currency risks are reduced
- ◆ More price transparency and more competition among companies within the Euro zone.

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Implications for the U.S.

- ◆ The Euro is a major international reserve asset.
- ◆ U.S. businesses and travelers will benefit by not having to exchange as many currencies and thus saving money

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Implications - Continued

- ◆ With one currency instead of 17, there should be less currency risk

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Establishment of an European Central Bank

- ◆ Located in Frankfurt, Germany
- ◆ Modeled after U.S. Federal Reserve System
- ◆ Regulate issuance of euros
- ◆ Main purpose: promote price stability

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Outline of Chapter 6

- ◆ Understand the Foreign Exchange Market
 - ❖ Functions
 - ❖ Participants
 - ❖ Transactions (Spot, Forward, and Swaps)
 - ❖ How Banks Make Money
 - ❖ Quotations (Quotes and Percentage Changes)
 - ❖ Arbitrage

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Outline - Continued

- ❖ Cross Rates

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Chapter 6 The Foreign Exchange Market

- ◆ Foreign Exchange - Money of a foreign country (foreign currency bank balances, banknotes, checks and drafts)

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Functions of the Foreign Exchange Market

- ◆ 1. Transfer of Purchasing Power - when two parties use different currencies (which is typical in international trade) one or more of the parties must transfer purchasing power to or from its own currency
- ◆ could use the exporter's currency, the importer's currency, or a third currency like the dollar

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Foreign Exchange Market Functions - Continued

- ◆ 2. Provision of credit - Many business transactions involve financing. The foreign exchange market provides a source for financing through letters of credit and bankers' acceptances
- ◆ Topic will be discussed in Chapter 20

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Foreign Exchange Market Functions - Continued

- ◆ Minimize Foreign Exchange Risk - currency values can change from the time deal is signed to the time payment is received and hence the exporter may end up getting less than expected or the importer may end up paying more than expected
- ◆ Topic will be discussed in Chapter 9

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Market Participants

- ◆ Two tiers: (1) interbank (wholesale) - rates usually determined here and (2) client (retail) - price takers
- ◆ Bank and nonbank foreign exchange dealers – make money by buying at one rate and selling at another. Also often act as market makers.

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Size of the Foreign Exchange Market

- ◆ Estimated in 2007 - net turnover in the world foreign exchange markets as \$3.2 trillion per business day (turnover - value of all spot, forward, and swap transactions)
- ◆ Leading markets - (1) U.K., (2) U.S., (3) Switzerland, and (4) Japan

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Foreign Exchange Transactions Spot

- ◆ In the interbank market, purchase of foreign exchange with delivery and payment to take place normally on the second following business day
- ◆ For retail customers usually do not have to wait 2 days

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Foreign Exchange Transactions (Outright) Forward

- ◆ Requires delivery of a specified amount of foreign exchange at a specified time in the future at a rate specified today
- ◆ Typical exchange dates are 1, 2, 3, 6, or 12 months from now

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Foreign Exchange Transactions Swaps

- ◆ Simultaneous purchase and sale of a given amount of foreign exchange for two different value (settlement) dates with the same counterparty
- ◆ Example - buy 1000 pounds today from XYZ Bank and then agree to sell the 1000 pounds back to XYZ in two months - both the buying and selling rate would be agreed today

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Swaps - Continued

- ◆ The previous example was “spot against forward” - one transaction now and one later
- ◆ Can have both transactions take place in the future - “forward against forward”
- ◆ Note individual is effectively borrowing a currency for a specified time on a fully collateralized basis

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Swaps - Continued

- ◆ Swaps and outright forwards combined account for about 57% of the foreign exchange market activity

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Nondeliverable Forwards (NDFs)

- ◆ Like a forward contract except settled only in U.S. dollars
- ◆ NDFs are contracted offshore (beyond reach of home government)
- ◆ Used a lot for speculative purposes

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NDFs - Continued

- ◆ Often home currencies are emerging market ones – not open spot market currency trading, not liquid money markets, nor quoted Eurocurrency interest rates.
- ◆ Problems arise if no actual spot market on settlement day.

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Foreign Exchange Rates and Quotations

- ◆ European terms - Foreign Currency / \$1 - Example A\$ 1.5 / \$ Method used most often
- ◆ American terms - U.S. Dollars / Foreign Currency - Example \$.67 / A\$
- ◆ European and American terms are reciprocals

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Direct and Indirect Quotes

- ◆ Direct - Home Currency / Foreign Currency
- ◆ Indirect - Foreign Currency / Home Currency
- ◆ From an American perspective \$2.00 / pound is direct while .5 pound / \$1 is indirect

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Quotations on a Points Basis

- ◆ Spot rate (\$/€) Bid \$1.6000/ € and ask \$1.6050/ €
- ◆ 1 month forward rate with points 10 (bid) and 15 (ask)
- ◆ 1 month forward rates: \$1.6010/ € and \$1.6065

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Points - Continued

- ◆ Suppose points had been -20 and -10
- ◆ New rates: \$1.5980/ € and \$1.6040/ €

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Banks Making Money

- ◆ The buy and sell rates are different
- ◆ Bid is the exchange rate in one currency at which a dealer will buy another currency
- ◆ Offer is the exchange rate the dealer will sell the other currency
- ◆ Example - Bid A\$ 1.58 / \$ (buy dollars or sell Australian dollars) - Offer A\$ 1.59 / \$ (sell dollars or buy Australian dollars)

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Banks Making Money

- ◆ Often banks charge a commission in addition to the spread (difference between buy and sell rate)

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Forward Quotations in Percentage Terms

- With direct quotes:

$$\frac{\text{Forward} - \text{Spot}}{\text{Spot}} \times \frac{360}{N} \times 100$$

- where N is the number of days

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Forward Quotations in Percentage Terms - Continued

Example: Spot rate \$2 / pound and 2 month forward rate \$2.10 / pound

$$\frac{2.10 - 2}{2} \times \frac{360}{60} \times 100 = 30 \%$$

This means the 2 month forward pound is selling at a 30 % per annum premium over the dollar

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Forward Quotations in Percentage Terms - Continued

With Indirect Quotes :

$$\frac{\text{Spot} - \text{Forward}}{\text{Forward}} \times \frac{360}{N} \times 100$$

To derive this formula substitute 1/S and 1/F for S and F respectively

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Indirect Quotes - Percentage Changes - An Example

Suppose the Spot Rate is A\$ 1.8 / \$ and the 3 month forward rate is A\$ 2 / \$

$$\frac{1.8 - 2}{2} \times \frac{360}{90} \times 100 = -40\%$$

This means the forward A\$ is selling at a 40 % per annum discount

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Percent Change in Spot Rates Over a Specified Time Period

With Direct Quotes :

$$\frac{\text{End rate} - \text{Beg Rate}}{\text{Beg Rate}} \times 100$$

With Indirect Quotes :

$$\frac{\text{Beg Rate} - \text{End Rate}}{\text{End Rate}} \times 100$$

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Example of a Change in Spot Rates

Suppose spot rate 1 year ago was Yen 115 / \$ and today it is Yen 100 / \$

$$\frac{115 - 100}{100} \times 100 = 15\%$$

Over the course of the year the Yen got stronger by 15 %

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Arbitrage

- ◆ You can make a riskless profit
- ◆ Discrepancies between rates will be eliminated after consideration for transaction costs

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Arbitrage Example 1

- ◆ In New York the exchange rate is \$ 2 / pound and in London it is \$ 2.10 / pound
- ◆ Individuals and banks will buy pounds in New York and sell them in London causing rates to move together
- ◆ In real life the banks would pick up any small discrepancy long before it would be profitable for an individual to do so

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Arbitrage Example 2

- ◆ Suppose rates in New York are \$ 2.50 / pound, \$.30 / A\$, and A\$10 / pound
- ◆ Individual could make money by (1) buy a pound for \$ 2.50, (2) get A\$ 10 for the pound, and (3) receive \$ 3.00 for the A\$ 10
- ◆ In equilibrium:
 $\$ / \text{pound} = (\$ / \text{A\$}) \times (\text{A\$} / \text{pound})$

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Arbitrage Example 2 - Continued

- In this case, \$ 2.50 / pound does not equal \$ 3.00 / pound, so an arbitrage opportunity exists
- Exchange Rates will change:
 - \$ 2.50 / pound ⬆
 - A\$ 10 / pound ⬇
 - \$.30 / A\$ ⬇

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Cross Rates

- ◆ For the exchange rate between two currencies that are not traded frequently, the exchange rate between the two can be calculated if one knows the exchange rates of the two currencies vis-a-vis the dollar
- ◆ Example: Dkr 6.00 / \$ and Pesos 4 / \$ would yield Dkr 1.50 / peso

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Chapters 3 and 6 Homework

- ◆ Chapter 3 - #2, 3
- ◆ Chapter 6 - #1, 7, 11, 13, 14, and 15.

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OUTLINE FOR CHAPTER 8

- ◆ Comparison of Forwards and Futures
- ◆ Understand foreign currency options and speculation
 - ❖ What is an option
 - ❖ The difference between American and European options
 - ❖ Premiums
 - ❖ Differences between Over-the-Counter and Organized Exchanges

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OUTLINE - CONTINUED

- ❖ When will calls and puts be exercised
- ❖ Profit Profiles for calls and puts both from the perspective of a buyer and a writer
- ❖ Speculation in the spot, forward and options markets

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Chapter 8 - Foreign Currency Derivatives

- ◆ Read pages 197-212

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Futures

- ◆ Both Forward and Future contracts allow one to purchase currencies for future delivery
- ◆ In the U.S. the most important market for foreign currencies futures is the International Money Market (IMM), a division of the Chicago Mercantile Exchange started in 1972

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Futures - Continued

- ◆ At the IMM can trade for nine currencies, gold, 90-day U.S. Treasury Bills, and Eurodollar time deposits
- ◆ Contracts traded on IMM are interchangeable with those on the Singapore International Monetary Exchange

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Speculation

- ◆ Purpose: Trying to make a profit
- ◆ Can gain or lose
- ◆ Speculation often performed in the futures market

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Speculation with Futures

- ◆ Short positions – if you believe the foreign currency will fall in value (relative to the futures price). You agree now to sell in the future at a fixed price without owning the foreign currency and then before the selling date you must buy the foreign currency. For example, sell a peso for \$.10 (delivery in 3 months) and hope to buy the peso for \$.09 before 3 months.

122

Speculation with Futures - Continued

- ◆ Long position – if you think the foreign currency will rise in value (relative to the futures price). In this case you would buy the foreign currency futures. For example, you would take a long position in pesos if the 3 month futures price for pesos is \$.11 and you expect it to be \$.12 in 3 months.

123

Futures and Forwards

Characteristic	Futures	Forwards
Size of contract	Standard contracts like 25,000 pounds	Custom made contracts
Exchange	Organized	No single location
Settlement	Rarely settled by delivery	Almost always settled by delivery

124

Futures and Forwards

Characteristic	Futures	Forwards
Maturity	Mature on selected Wednesdays of certain months	Can expire on any day
Counterparty	Contracts between client and exchange	Contracts between "bank" and client

125

Foreign Currency Option

- ◆ A contract that gives the buyer the right to buy (call) or sell (put) a given amount of foreign exchange at a fixed price per unit (exercise or strike price) for a specified period of time
- ◆ Buyer of an option is the holder while the seller of an option is the writer or grantor.

126

American vs. European Option

- ◆ European options can only be exercised at the expiration date
- ◆ American options can be exercised at any time between the time the contract is written and the expiration date

127

Premiums

- ◆ Cost of option, usually paid in advance
- ◆ It is the value of the option
- ◆ In options offered by banks, premiums are quoted as a percentage of the transaction amount
- ◆ In options offered on exchanges, premiums are quoted as domestic currency amount per unit of foreign currency

128

Options Markets for Foreign Currency

- ◆ Over-the-counter market (bank) gives custom-made options (principal, strike price, and maturity) on major currencies for up to several years
- ◆ Organized Exchanges also offer options like the Philadelphia Stock Exchange and Chicago Mercantile Exchange

129

Over-the-Counter Market

- ◆ Transactions of a minimum of \$ 1 million

130

Organized Exchanges

- ◆ Clearinghouse is counterparty to all transactions
- ◆ Variety of alternatives are offered to clients

131

Calls

- ◆ A European call will be exercised when the exercise price is less than the spot rate
- ◆ Suppose the spot price is \$.60 / SF and the exercise price is \$.55 / SF, the buyer will want to exercise - the buyer could buy a SF for \$.55 and turn around and sell it for \$.60

132

Profits from Calls

- ◆ Profit = Spot Rate - (Strike Price + Premium)
- ◆ For the previous example assume that the premium is \$.01 / SF then
Profit = \$.60 - (\$.55 + \$.01) = \$.04 / SF
- ◆ For spot rates less than exercise price the buyer will not exercise and the loss is the premium

133

Writer (Grantor) of a Call

- ◆ The profit and loss for a writer of a call is just the opposite the profit and loss for the buyer of a call

134

Profit Profile for Both a Buyer and Writer of a Call

- ◆ Example from the book:
- ◆ Strike price: \$.585 / SF and premium \$.005 / SF
- ◆ See pages 217 and 219

135

Puts

- ◆ The buyer of a put makes money when the exercise price is higher than the spot price
- ◆ Profit for a buyer of a put:
- ◆ Profit = strike price - (spot rate + premium)
- ◆ Example: strike price = \$.60 / SF premium = \$.01 / SF, and spot rate = \$.58 / SF
- ◆ Profit = \$.60 - (\$.58 + \$.01) = \$.01 / SF

136

Profit and Loss Profile for Both a Buyer and Writer of a Put

- ◆ Example from book:
Strike price = \$.585 / SF and premium of \$.005 / SF
- ◆ See pages 220 and 221

137

Speculation - Spot Market

- ◆ Can buy a currency and hope the currency increases in value
- ◆ In this case no time that you must sell the currency you bought
- ◆ Maximum gain is unlimited and maximum loss is the purchase price.

138

Speculation - Forward Market

- ◆ Investor compares forward rate with investor's assessment of future spot rate
- ◆ Example: 6 Month Forward rate = \$ 2.00 / pound and investor believes future spot rate will be \$ 2.05 / pound in 6 months
Investor will buy forward pounds now
- ◆ Investor may or may not be required to put down collateral

139

Speculation - Forward Market - Continued

- ◆ Another possibility is that prior to maturity the speculator could purchase an offsetting contract
- ◆ In the prior example, suppose the 2 month forward rate in 4 months is \$2.04 / pound. The individual could sell pounds forward then and as a result, lock in some profit.

140

Homework - Chapter 8

- ◆ # 1, 3, 4, 7, and 8.

141

OUTLINE OF CHAPTER 7

- ◆ Understand the following Parity conditions and be able to solve problems involving these relationships (for example, forecasting exchange rates and where to invest your money)
 - ❖ Purchasing Power Parity
 - ❖ Fisher Effect
 - ❖ Interest rate Parity (and also Covered Interest Arbitrage)

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OUTLINE - CONTINUED

- ❖ International Fisher Effect
- ❖ Forward Rate as an Unbiased Predictor of the future Spot Rate
- ◆ Exchange Rate Determination
 - ❖ The influences of Interest Rates and Inflation on Exchange Rates

143

Chapter 7 International Parity Conditions

- ◆ The first part of this chapter explains some basic economic relationships between prices, interest rates, forward rates and spot rates.
- ◆ These relationships (parity conditions) are often helpful in forecasting long-term exchange rates

144

Prices and Exchange Rates

- ◆ Countries with high inflation rates should see their exports become less desirable (their prices are climbing fast) and their imports more desirable
- ◆ As a consequence, the value of the currency should drop

145

Law of One Price

- ◆ If an identical good or service is sold in two markets with no selling restrictions or transportation costs, the real price of the good or service should be the same
- ◆ In two different countries:
 $P^H = S \times P^F$ where S is the exchange rate (Home / Foreign), P is the price, and H and F stand for home and foreign respectively

146

Law of One Price - Continued

- ◆ In reality, real prices differ considerably across countries - Big Mac (see page 166 for a comparison of prices)
- ◆ Another form of this principle would be that the real prices of a basket of goods should be the same in different markets

147

Absolute Version of Purchasing Power Parity

- ◆ Hence $PI^H = S \times PI^F$ or $S = PI^H / PI^F$ where PI stands for price index
- ◆ Absolute Version of Purchasing Power Parity (PPP) says that the spot rate is determined by relative prices of a basket of goods

148

Relative Version of Purchasing Power Parity

- ◆ Assuming that the spot rate was in equilibrium at one time, the relative version of PPP says that a change in the differential rate of inflation between countries tends to be offset in the long run by an opposite change in the exchange rate

149

PPP

- ◆ With direct quotes (home / foreign):
 $(S_{t+1} - S_t) / S_t = (I_H - I_F) / (1 + I_F)$ where I is inflation and t+1 and t stand for time at t+1 and t respectively
- ◆ With indirect quotes (foreign / home):
 $(S_t - S_{t+1}) / S_{t+1} = (I_H - I_F) / (1 + I_F)$

150

Forecasting Exchange Rates with PPP

- ◆ What is expected exchange rate a year from now if the current spot rate is \$ 2 / pound and expected inflation rates in the U.S. and the U.K. are 5 % and 10 % respectively

$$(S_{t+1} - 2) / 2 = (.05 - .1) / (1 + .1)$$
$$S_{t+1} = \$ 1.91 / \text{pound}$$

151

Example 2 - Forecasting

- ◆ the spot rate is A\$ 1.6 / \$ and expected inflation rates are 10 % and 6 % in the U.S. and Australia respectively. What is the expected exchange rate 1 year from now and 3 years from now?

152

Tests of PPP

- ◆ PPP not accurate
- ◆ Better at predicting the direction of the exchange rate
- ◆ More accurate in the long-run than the short-run
- ◆ Better when one country has a very high rate of inflation and/or has an underdeveloped capital market

153

Problems with PPP Tests

- ◆ Use of indices (countries have different consumption tastes and some goods are not traded)
- ◆ Theory assumes no governmental interference in trade and zero transportation costs
- ◆ Ignores other factors like income and productivity
- ◆ Cause and effect (inflation causes exchange rates to change but also exchange rates changes cause inflation to change)

154

Exchange Rate Index: Nominal

- ◆ Nominal effective exchange rate index calculates on a weighted average basis the value of the currency at different times. Often the weights are trade weighted.
- ◆ Can tell you whether the value of the currency has gone up or down compared to some base period

155

Exchange Rate Index: Real

- ◆ Real effective exchange rate index - nominal effective exchange rate index times the ratio of U.S. dollar costs over foreign currency costs
- ◆ In a sense it measures deviations from PPP
- ◆ A value greater (less) than 100 would indicate the currency was "overvalued" ("undervalued")

156

Exchange Rate Pass - Through

- ◆ Pass - through is complete or 100 % if the price in the home currency increases by the same percent as the foreign exchange rate increase
- ◆ If the price increase is less than the increase in exchange rates (for example exchange rate increases by 10 % and prices increase by only 6 %) then pass - through is partial and the company absorbs the difference

157

Example – Exchange Rate Pass-Through

- ◆ In this case would say that the pass through was 60% (6/10)

158

Price Elasticity of Demand

- ◆ Price elasticity of demand = $\% \Delta Q_d / \% \Delta P$ (percentage change in quantity demanded as a result the percentage change in price)
- ◆ If a good is price inelastic (price elasticity less than 1) may have high pass through. The demand for the good does not suffer much as a result of the price increase.

159

Fisher Effect

- ◆ Approximation formula: $i = r + E[\pi]$ where i is the nominal interest rate, r is the real interest rate (the interest rate when inflation is zero) and $E[\pi]$ is the expected inflation
- ◆ As inflation increases investors demand higher interest rates to compensate for the loss of purchasing power

160

Fisher Effect

- ◆ True form of Fisher Effect:
- ◆ $i = (1 + r)(1 + \pi) - 1$ π = expected inflation
- ◆ So $i = r + \pi + r\pi$
- ◆ Last term is the product of two small numbers and so it is dropped to get the approximation form.

161

Fisher Effect - Continued

- ◆ This suggests that countries have relatively high interest rates due to relatively high inflation rates

162

Fisher Effect - Continued

- ◆ Empirical tests indicate that Fisher Effect holds for short-term government maturity securities (T-bills and Notes)

163

Where to Invest Money

- ◆ Suppose the spot rate is \$.91 / C\$ and the 180 day forward rate is \$.9025 / C\$. Interest rates (per annum) are 6.75 % and 9 % in the U.S. and Canada respectively

164

Invest - Continued

- ◆ Method 1:
 - ❖ Invest in the U.S. - will have after 6 months
 $\$1000 \times (1 + .0675/2) = \1033.75
 - ❖ Invest in Canada - will have
 $(\$1000 / \$.91) \times (1 + .09/2) \times (\$.9025) = \$1036.39$
 - ❖ Better to invest in Canada

165

Invest - Continued

- ◆ Note the 6 month forward rate is selling for a $-.82\%$ discount which comes from $[(.9025 - .91) / .91] \times 100$
- ◆ Method 2 (involves a small approximation)
 - Net return in U.S. is $.0675 / 2 = 3.375\%$
 - Net return in Canada is $.045 - .0082 = 3.68\%$
 - Better to invest in Canada

166

Covered Interest Arbitrage (CIA)

- ◆ One could borrow funds in the U.S. and use those funds for the Canadian investment and make a riskless profit of $\$2.64$ ($\$1036.39 - \1033.75) for each $\$1000$ borrowed

167

Equilibrium

- ◆ Since it is possible to make money through CIA in this example, this suggests that markets are not in equilibrium
- ◆ In this example, investors will bid up the spot Canadian dollar, forward U.S. dollar will get stronger, interest rates in the U.S. (Canada) will get larger (smaller)
- ◆ CIA will cause markets to move toward equilibrium

168

Uncovered Interest Arbitrage

- ◆ Like CIA except investor does not sell higher yielding proceeds forward.
- ◆ Investor accepts currency risk.

169

Example 2 - Making Money

- ◆ Spot rate – Yen 130 / \$, 1 year forward rate is Yen 125 / \$, interest rates in U.S. (Japan) are 6 % (1 %)

170

Interest Rate Parity

- ◆ Assuming similar (maturity and risk) securities and no transaction costs
- ◆ Forward Premium or discount = interest rate differential

171

Interest Rate Parity - Formulas

- ◆ Direct quote:

$$(F - S) / S = (i^H - i^F) / (1 + i^F)$$

- ◆ Indirect quote:

$$(S - F) / F = (i^H - i^F) / (1 + i^F)$$

where S = spot, F = forward, i = interest rate, and H and F over the interest rates stand for home and foreign

172

International Fisher Effect or Fisher Open

- ◆ The expected change in the exchange rate should equal but in the opposite direction to the difference in interest rates between the two countries
- ◆ If the U.S. has a higher interest rate (4%) than the U.K. (3%) then expect the pound to appreciate 1%
- ◆ Note the formulas are very close to those for Interest Rate Parity

173

International Fisher Effect

- ◆ For direct quotes:

$$(S_2 - S_1) / S_1 = (i^H - i^F) / (1 + i^F)$$

- ◆ For indirect quotes:

$$(S_1 - S_2) / S_2 = (i^H - i^F) / (1 + i^F)$$

- ◆ where S_1 is the spot rate at the beginning of the period and S_2 is the (expected) exchange rate at the end of the period

174

Forecasting with the International Fisher Effect

- ◆ Just a rough estimate
- ◆ Example 1: Spot rate is \$2 / pound and interest rates are 6 % (10 %) per annum in the U.S. (U.K.) - What is the exchange rate 3 years from now?

175

Example 1 - Continued

- ◆ compound interest in the U.S. is $(1.06)^3 - 1 = .19$ and in the U.K. it is $(1.1)^3 - 1 = .33$ so using the formula:
 $(S_2 - 2) / 2 = (.19 - .33) / (1 + .33)$
 $S_2 = \$1.79 / \text{pound}$
where S_2 is the expected exchange rate after three years

176

Example 2

- ◆ Spot = Yen 130 / \$ and interest rates in the U.S. and Japan are 8 % and 2 % respectively. What is the expected exchange rate 4 years from now?

177

Forward Rate

- ◆ Book argues that Forward rate can be calculated by the spot rate and the ratio of comparable interest rates.
- ◆ $F = S (1 + i_f)/(1 + i_h)$ for indirect quotes
- ◆ $F = S (1 + i_h)/(1 + i_f)$ for direct quotes

178

Forward Rates - Continued

- ◆ Example: spot rate = SF1.5/\$, $i_{sf} = 8%$ p.a., $i_{U.S.} = 4%$ p.a., 180 day forward rate?
- ◆ $F = 1.5 (1.04)/(1.02) = SF1.529/\$$

179

Forward Rates as Unbiased Predictors of Future Spot Rates

- ◆ Unbias suggests that the expected value of the future spot rate is the forward rate today - it would not on average over or under estimate the future spot rate
- ◆ Unbias does not mean the forward rate is a good predictor
- ◆ The empirical results indicate that the forward rate is probably not an unbiased predictor of the future spot rate

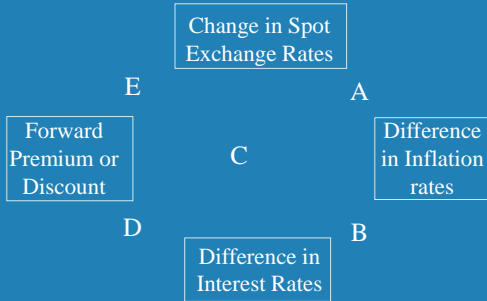
180

Unbias - Continued

- ◆ The empirical results suggest that some forecasting services would probably be better than just using the forward rate to predict future spot rates
- ◆ Of course, the forward rate is a cheap forecast

181

Prices, Interest Rates, Inflation, and Exchange Rates in Equilibrium



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Prices, Interest Rates, Inflation, and Exchange Rates in Equilibrium

- ◆ where
 - A = PPP
 - B = Fisher Effect
 - C = International Fisher Effect
 - D = Interest Rate Parity
 - E = Forward Rate as an Unbias Predictor

183

Interest Rates and Exchange Rates

- ◆ How do changes in interest rates affect exchange rates?
- ◆ Recall $i = r + E[\dot{I}]$
- ◆ if r increases relatively to other countries then the home currency should get stronger
- ◆ if $E[\dot{I}]$ increases relatively to other countries then the home currency should weaken

184

Homework - Chapter 7

- ◆ # 6a, 7, 9, and 18 (assume real rates are equal in U.S. and London)

185

Outline of Chapter 10

- ◆ Role of Expectations in Determining exchange rates
- ◆ Asset Market Approach to Forecasting

186

Foreign Exchange Rate Determination

- ◆ We are going to concentrate on the Asset Market Approach to Forecasting

187

Exchange Rate Forecasting

- ◆ Most decisions (capital budgeting, pricing, timing of remittances, portfolio investments etc.) of international corporations depend in part on estimates of future exchange rates
- ◆ Book (pages 161-167) provides some practical information on forecasting

188

Exchange Rate Changes

- ◆ My own view about exchange rate changes is that they reflect changes in expectations
- ◆ suppose the market expects inflation to be 15 % in the U. S. next year and tomorrow the forecast is revised to 10 % - what should happen to the dollar tomorrow?

189

Exchange Rate Changes

- ◆ My own view about exchange rate changes is that they reflect changes in expectations
- ◆ suppose the market expects inflation to be 15 % in the U. S. next year and tomorrow the forecast is revised to 10 % - what should happen to the dollar tomorrow?

190

Expectations - Continued

- ◆ Dollar should get stronger tomorrow because the news is good (inflation is better than expected).
- ◆ Previously the dollar should have weakened due to the bad news about inflation (expected to be 15 %)

191

Asset Market Approach to Forecasting

- ◆ Individuals have a choice as to which currency to hold
- ◆ In the short-term, exchange rates determined a lot by real interest rate differentials (which country has the highest real rates), economic growth and profitability

192

Asset Market Approach to Forecasting - Continued

- ◆ Other important considerations
 - ❖ Capital market liquidity
 - ❖ Economic, social, and political infrastructure
 - ❖ Corporate governance practices

193

Homework Chapter 10

- ◆ 10.2-10.3

194

Foreign Exchange Risk

- ◆ Transaction Exposure - Chapter 11
- ◆ Operating Exposure - Chapter 12
- ◆ Translation Exposure - Chapter 13

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OUTLINE FOR CHAPTER 11

- ◆ Understand Transaction Risk
 - ❖ Definition of Transaction Risk
 - ❖ How to hedge a receivable
 - ❖ How to hedge a payable
 - ❖ Picking the best alternative
 - ❖ Should a firm hedge

196

Chapter 11 - Transaction Risk

- ◆ Measures changes in the value of outstanding financial obligations incurred prior to a change in exchange rates but not due to be settled until after an exchange rate change

197

Transaction Exposure Arises From:

- ◆ Buying or selling goods and services on credit whose prices are stated in a foreign currency
- ◆ Borrowing or lending in a foreign currency
- ◆ Being a party to an underperformed foreign exchange forward contract
- ◆ Acquiring other assets or incurring other liabilities denominated in a foreign currency

198

Transaction Exposure Example

- ◆ Exporter sells an item for 40,000 pounds and expects exchange rate to be \$ 2 / pound in 60 days
- ◆ Exporter expects to receive \$ 80,000
- ◆ Risk is that the exporter will receive more or less than \$ 80,000

199

Transaction Exposure

- ◆ Note if exporter invoices in home currency the exporter avoids transaction risk
- ◆ In this case risk is transferred to the importer

200

Management of Transaction Exposure

- ◆ Contractual Hedges - Chapter 11
- ◆ Operating Hedges - Chapter 12
- ◆ Financial Hedges - Chapter 12

201

Hedging

- ◆ Firm has an asset or liability that can rise or fall in value. Hedging takes an action that will counter the rise or fall in the asset or liability.
- ◆ Hedging reduces the possible losses of the firm at the expense of reducing possible gains. It reduces the variance of cash flows.

202

Hedging a Receivable- Example

- ◆ U.S. exporter has 1 million pound receivable due in 6 months
- ◆ Spot rate - \$ 2.00 / pound
- ◆ Forward rate - \$ 1.90 / pound (assume this is also the expected spot rate)
- ◆ U.S. borrowing (lending) rate - 9 (8) % p.a.
- ◆ U.K. borrowing (lending) rate - 14 (12) % p.a.

203

Hedging Example - Continued

- ◆ Weighted Average Cost of Capital (W.A.C.C.) - 12 %
- ◆ Put option - strike price of \$ 1.90 / pound with a premium of 1 %

204

Alternatives

- ◆ Want to pick the alternative that gives the exporter the most number of dollars
- ◆ (1) Do nothing
 - Assuming $F = E(S)$, expected receipts are \$ 1,900,000
 - Amount is uncertain (could receive more or less than \$1,900,000)

205

Alternatives - Continued

- ◆ (2) Buy forward dollars today for pounds
 - In 6 months exchange pounds from receivable for dollars
 - Receive for certain \$ 1,900,000

206

Alternatives - Continued

- ◆ (3) Money market hedge
 - Borrow pounds today, convert to dollars, invest funds in U.S.
 - Repay the pound loan with 1 million pound receivable

207

Money Market Hedge - Continued

- ◆ How much to borrow?
Borrow the Present value of 1 million pounds -
 $[(1\text{million pounds}) / (1.07)] = 934,579$
pounds
- ◆ Note in 6 months repay principal
(934,579) plus interest $[(934,579) (.07) = 65,421]$ which totals 1 million pounds

208

Converting Pounds to Dollars

- ◆ Exporter would convert 934,579 pounds to dollars at the spot rate of \$ 2 / pound which equals \$ 1,869,158

209

Investing Funds in the U.S.

- ◆ Exporter would invest \$ 1,869,158 in the U.S.
- ◆ What rate (arguments could be made for at least 3 different rates)
Investment rate - (8 % / 2)
Borrowing rate - (9 % / 2) assumed here
investor would have borrowed funds in the U.S. and the pound loan substitutes for the \$ loan

210

What Rate - Continued

Invest funds in the operation of the firm - use the W.A.C.C. rate - (12 % / 2)

- ◆ For this problem I will use the investment rate of 4 %

211

Proceeds in 6 Months

- ◆ Using the investment rate of 4 % , proceeds will be:
 $(\$1,869,158) (1.04) = \$1,943,925$
- ◆ Would accumulate different amounts if used either the 4.5 % or 6 % rates

212

Alternatives - Continued

- ◆ (4) Put option (right to sell pounds)
 - ❖ Cost of premium:
 $(1 \text{ million pounds}) (.01) (\$ 2 / \text{pound}) = \$20,000$
 - ❖ Future value of premium:
 $(\$ 20,000) (1.04) = \$ 20,800$
- One could argue that other interest rates (4.5 % or 6 %) would be appropriate. In this case using different interest rates would not change the final results much

213

Options - Continued

- ◆ In 6 months exporter is guaranteed to have at least \$ 1,900,000
- ◆ If future spot rate is \$ 1.85 (\$ 2.00) / pound the exporter will receive \$ 1,900,000 (\$ 2,000,000)
- ◆ Net proceeds will be at least \$ 1,900,000 - 20,800 = \$ 1,879,200
- ◆ Unlimited upside potential

214

Best Alternative

- ◆ Depends - (1) how much risk company is willing to accept and (2) company's expectation of the future exchange rate (amount and variability)
- ◆ Note: Unless the firm's foreign exchange department is very sophisticated, I do not think the company should try and outguess the market

215

Best Alternative - Continued

- ◆ In this problem can say money market hedge is better than forward hedge no matter which of the three interest rate assumptions is made
- ◆ Choosing between the money market hedge and the put option is more difficult. How much risk is the company willing to accept for potentially more gain.

216

Hedging a Payable - Example

- ◆ Suppose a firm owes HK\$ 1 million in 6 months
- ◆ Spot rate is \$.20 / HK\$ and 6 month forward is \$.25 / HK\$
- ◆ Lending (borrowing) rate in U.S. is 18 % (20 %) p.a.
- ◆ Lending (borrowing) rate in Hong Kong is 2 % (3 %) p.a.

217

Example - Continued

- ◆ Call option with a strike price of \$.22 / HK\$ with a premium of 1 %

218

Alternatives

- ◆ Pick the least costly alternative
- ◆ (1) Do nothing
 - if the $F = E(S)$, then the firm is expected to pay \$ 250,000
 - This amount is uncertain

219

Alternatives - Continued

- ◆ (2) Forward market hedge (buy forward Hong Kong dollars)
Guaranteed to pay \$ 250,000
(\$.25 / HK\$) (HK\$ 1million]

220

Alternatives - Continued

- ◆ (3) Money market hedge
Lend the present value of 1 million Hong Kong dollars. Likely the importer would borrow dollars first and then convert the proceeds to Hong Kong dollars.

221

How Much to Lend?

- ◆ At 2 % lending rate in Hong Kong, will need to lend:
 $[(\text{HK\$ } 1\text{million}) / (1.01)] = \text{HK\$ } 990,099$
- ◆ This is the equivalent of \$ 198,020
 $[(\text{HK\$ } 990,099) (\$.20 / \text{HK\$})]$

222

Amount of Dollars to Repay

- ◆ Assuming the importer had to borrow the funds in the U.S., the amount to repay:
 $[(\$ 198,020) (1.1)] = \$ 217,822$

223

Alternatives - Continued

- ◆ Call option (the right to buy HK\$ in this case)
 - ❖ Cost of Premium today:
 $[(\text{HK\$ } 1\text{million}) (.01) (\$.20 / \text{HK\$})] = \$ 2000$
 - ❖ Future value of premium using same interest rate assumption of 10 % :
 $[(\$ 2000) (1.1)] = \2200

224

Call - Continued

- ◆ The maximum the firm will have to pay is
 $[(\$.22 / \text{HK\$}) (\text{HK\$ } 1\text{million})] = \$ 220,000$ plus \$2200 (premium) for a total of \$ 222,200
- ◆ Note if the exchange rate turns out to be \$.21 / HK\$ the firm will pay only \$ 212,200

225

Best Alternative

- ◆ In this example, money market is better than the forward hedge. Both the call option and the money market hedge appear to be attractive possibilities.
- ◆ The best solution will depend on management's risk tolerance and their assessment of exchange rate movements

226

Should a Firm Hedge

- ◆ Hedging reduces uncertainty (variability is lower with hedging)
- ◆ Hedging may lessen the chance a firm goes bankrupt or have financial distress
- ◆ However, given that there are costs to hedging (transaction costs and time spent), the expected profits from hedging are slightly negative

227

To Hedge - Continued

- ◆ Stockholders can diversify some currency risks by investing in many companies
- ◆ But, managers of firms know currency risks of their firms better than their stockholders. Selective hedging may be beneficial to stockholders.

228

To Hedge - Continued

- ◆ By reducing uncertainty, managers may be able to plan better and perhaps can undertake some more profitable investment projects
- ◆ Conclusion: there are pros and cons to hedging

229

Who Should Hedge

- ◆ Occasional exporter (importer) with a big foreign sale (purchase) does not want to take the risk of a big loss
- ◆ A multinational with many relatively small foreign transactions probably does not need to hedge since losses will probably even out with gains

230

Complex Options

- ◆ A synthetic forward (receivable) =
 - ❖ Long position in the foreign currency (say 1£)
 - ❖ A put on the foreign currency with a strike price at the forward with a premium of x
 - ❖ Sell a call with strike price at the forward earning a premium of x
- ◆ Assume forward = strike price of \$1.50/ £
- ◆ Premiums should be equal (both at the ATM)

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Complex Options - Continued

- ◆ At exchange rates below \$1.50/£ (say \$1.48/ £)
 - ❖ Receive 1 £
 - ❖ Call option not exercised
 - ❖ Exercise put option and get a value of \$1.50
 - ❖ Premiums cancel out

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Complex Options - Continued

- ◆ At exchange rates above Forward rate (say 1.52/ £)
 - ❖ Receive 1 £
 - ❖ Put option not exercised
 - ❖ Call option exercised (lose 1 £ and receive the strike price (forward rate))
 - ❖ Premiums cancel out

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Complex Options - Continued

- ◆ In either case, the value of your position is = Forward rate
- ◆ No matter what the exchange rate turns out the value of your position = Forward rate
- ◆ By manipulating the options strike prices you can end up with a gain or loss on the premiums and various types of protection (see the appendix to chapter 11)

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A Synthetic for a Payable

- ◆ Pay 1 £ in the future
- ◆ Buy a call option at a strike price of the forward rate (pay premium)
- ◆ Sell a put with a strike price of the forward rate (receive premium)

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Homework - Chapter 11

- ◆ #1 in book
- ◆ Given the following facts:
- ◆ Spot rate - \$2/£
- ◆ 3 month Forward rate - \$1.98/£
- ◆ 3 month U.K. (U.S.) interest rate - 4% (3%) per year.
- ◆ 3 month put contract with a strike price of \$1.99/£ with a 4% premium

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Homework - Continued

- ◆ 3 month call option with a strike price of \$1.99/£ with a 3.5% premium
- ◆ A) How would company ABC hedge a £200 million receivable? Which alternative would you pick?
- ◆ B) How would company ABC hedge a £400 million payable? Which alternative would you pick?

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OUTLINE FOR CHAPTER 12

- ◆ Understand Operating Exposure
 - ❖ Definition
 - ❖ What firms are the most vulnerable to this risk?
 - ❖ Calculating Cash Flows under different exchange rates
 - ❖ The impact of inflation on Operating risk
 - ❖ Management of Operating Exposure through diversification

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OUTLINE - CONTINUED

- ❖ Managing Operating and Transaction Exposure by changing operating procedures

- ❖ Managing Operating and Transaction Exposure by changing financial policies

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Operating Exposure - Chapter 12

- ◆ Measures the change in the present value of a firm resulting from changes in future operating cash flows caused by an unexpected change in the exchange rate
- ◆ Sometimes called economic exposure, competitive exposure, or strategic exposure

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Operating Exposure - An Example

- ◆ How will a devaluation of the local currency affect the value of a firm in Mexico?
- ◆ Will the firm be worth more or less after the exchange rate change?

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Example - Continued

- ◆ Answer - it depends on the characteristics of the firm
- ◆ For the moment lets count our money in pesos (for an American owned firm counting in dollars would probably be more appropriate)

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Example - Continued

- ◆ Value of the firm is based on the present value of the firms expected cash flows
- ◆ What should happen to revenues and costs

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Revenue Changes

- ◆ Export revenues should increase (if the firm keeps the same foreign price abroad this will translate into more pesos / sale or if they drop the foreign price - volume should increase)
- ◆ The more the firm's competitors are non-Mexican, the better off the firm in general

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Revenues - Continued

- ◆ Domestic sales may stay relatively constant
- ◆ Foreign (non-Mexican) companies may want to raise prices in Mexico so the Mexican firm may be able to steal some market share
- ◆ Aggregate demand may increase in Mexico as a result of the devaluation. If that is true sales of the firm's products may increase

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Revenues - Continued

- ◆ On the negative side, there may be an increase in inflation which would negate some of the benefits of the devaluation

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Cost Changes

- ◆ Import costs will tend to rise
- ◆ Domestic costs may rise a little due to inflation and / or a general increase in demand for raw materials and labor

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Example - Continued

- ◆ The Mexican firm that exports a lot and sources domestically may be helped by the devaluation
- ◆ On the other hand, the Mexican firm that sells locally and sources outside Mexico will likely be hurt from the devaluation

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Operating Exposure

- ◆ A first generalization is that firms that source and sell in different markets are more subject to operating exposure than those that sell and source in the same market (an example of this is an exporter who sources externally)

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Generalization - Continued

- ◆ This generalization is subject to an important caveat - a lot depends on the firm's competitors
- ◆ Suppose there is an American firm that sells and sources entirely in the U.S. and its competitors are Japanese - this firm could have a lot of exchange risk if the Yen / dollar exchange rate changes

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Numerical Example of Operating Exchange Risk

- ◆ British firm sells 500,000 units to the U.S. at \$ 40 / unit and 500,000 units to the U.K. at 20 pounds each. When exchange rates change volume remains constant
- ◆ Costs / unit for the 1 million units are \$ 6 and 12 pounds each (raw materials from the U.S. and labor from the U.K.)
- ◆ Tax rate - 50 %
- ◆ Depreciation - 2 million pounds / year

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Example - Continued

- ◆ Assume the expected exchange rate is \$ 2 / pound and 2 other (unexpected) exchange rate possibilities are \$ 1.50 / pound and \$ 2.50 / pound
- ◆ This example assumes the firm sells in constant foreign prices and its costs remain constant in foreign prices
- ◆ What are the cash flows for the 3 exchange rates?

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Cash Flow from Operations

<i>Various Exchange Rates</i>	<i>\$2.00</i>	<i>\$1.50</i>	<i>\$2.50</i>
Sales - U.S.	10	13.33	8
Sales - U.K.	10	10	10
Total Sales	20	23.33	18
Direct Costs - U.S.	3	4	2.4
Direct Costs - U.K.	12	12	12
Depreciation	2	2	2
EBIT	3	5.33	1.6

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Cash Flow from Operations - Continued

<i>Various Exchange Rates</i>	<i>\$2.00</i>	<i>\$1.50</i>	<i>\$2.50</i>
Tax	1.5	2.67	.8
Earnings After Tax	1.5	2.67	.8
Depreciation	2	2	2
Cash Flow in Pounds	3.5	4.67	2.8
Cash Flow in \$	7	7	7
<i>(numbers in millions of pounds or dollars)</i>			

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Implications of the Example

- ◆ Operating exposure depends on what currency the firm counts its money (in this case no risk in \$ but moderate risk in pounds)
- ◆ The example is unusual in that there is no risk when the currency of denomination is the \$

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Operating Exposure with Inflation

- ◆ Example: a car company imports cars from the U.K. for 10,000 pounds and expects to pay \$ 20,000 (at \$ 2 / pound). What happens if the pound appreciates to \$ 2.20 / pound?
- ◆ The company will have to pay \$ 22,000

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Operating Exposure with Inflation - Continued

- ◆ Suppose inflation causes the price of cars to rise by 10 % , then the company is not any “worse” off
- ◆ Point of the example is that one must consider inflationary effects along with exchange rate effects in calculating operating exposure

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Example of Operating Exposure with Inflation

- ◆ Assume the base case is a U.S. exporter who sells 1 million units at 5 pounds each that costs \$ 6 / unit, tax rate = 50 % , depreciation is \$ 2 million per year, and spot rate is \$ 2.00 / pound

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Example of Operating Exposure with Inflation - Continued

- ◆ What happens: (1) if dollar depreciates to \$ 2.50 / pound and selling price in pounds, cost in dollars, volume all stay the same and (2) same as case 1 above but cost of goods sold increases due to inflation from \$ 6 to \$ 7 / unit?

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Management of Operating Exposure through Diversification

- ◆ Key idea: Management must recognize a disequilibrium and be able to react quickly and effectively
- ◆ A diversified firm can react quickly because it has many options to pursue
- ◆ Diversification - Operations and Financing

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Diversifying Operations

- ◆ Want to diversify sales, production facilities and sourcing to take advantage of exchange rate changes
- ◆ If the home currency falls in value the firm would want to stress exports
- ◆ If it becomes cheaper to produce in Italy, would want to shift marginal (example overtime) production there, if feasible

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Diversifying Operations - Continued

- ◆ If it becomes cheaper to buy raw materials in China due to exchange rate changes, then would want to source there
- ◆ Note a purely domestic firm is not in a position to switch sales, production facilities and perhaps sourcing

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Diversifying Financing

- ◆ The firm would want to be in a position to take advantage of deviations from the International Fisher Effect or Interest Rate Parity
- ◆ Only companies with the ability to borrow in more than one market or currency can do this

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Managing Operating and Transaction Exposure

- ◆ Examples:
 - ❖ Leads and lags
 - ❖ Risk Sharing
 - ❖ Re invoicing centers
 - ❖ Matching currency cash flows
 - ❖ Back to Back or Parallel loans
 - ❖ Currency swaps

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Leading and Lagging

- ◆ To lead (lag) is to pay early (late)
- ◆ Suppose a firm has a receivable in a soft currency, it would like to be paid early before its currency depreciated. Unfortunately the other firm would not want to do this.

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Leading and Lagging - Continued

- ◆ Leading and lagging between independent firms usually results in one winner and one loser and hence it is hard for independent firms to agree on a mutually satisfying strategy
- ◆ Between affiliates of the same company can agree to lead and lag for the betterment of the entire firm

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Risk Sharing

- ◆ Works for firms that have a continual relationship
- ◆ Might set up an arrangement as follows:
 - ❖ Use actual exchange rate if exchange rate turns out to be between \$ 1.80 / pound and \$ 2.00 / pound
 - ❖ For exchange rates below \$ 1.80 / pound (above \$ 2.00 / pound) use average of actual and \$ 1.80 / pound (actual and \$ 2.00 / pound)

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Risk Sharing - Continued

- ◆ Suppose as in the previous slide a firm had a £100 million receivable and the exchange rate turned out to be \$1.60/£
- ◆ Instead of receiving a \$160 million (with an exchange rate of \$1.60/£) the firm would receive \$170 million (with an exchange rate of \$1.70/£ per the risk sharing agreement)
- ◆ Of course this same firm would lose with the risk sharing agreement for exchange rates above \$2.00/£.

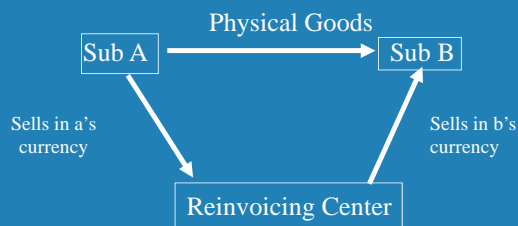
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Currency Clauses - Continued

- ◆ Purpose of this arrangement is to avoid having one company take a big loss on a transaction

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Reinvoicing Center



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Reinvoicing Center - Continued

- ◆ No transaction risk for sub a or sub b
- ◆ One advantage to a reinvoicing center is that personnel can become experts in hedging and can manage transaction risk in a big scale
- ◆ Since dealing in bigger amounts of money make get better quotes from banks

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Reinvoicing Center - Continued

- ◆ However there is a cost in setting up this unit (set up and a continual cost)

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Matching Currency Cash Flows

- ◆ If a firm receives a lot of cash flows from a country it could reduce its exposure by borrowing in that country (repay the debt and principal in that currency) or buying raw materials from that country and paying in that currency
- ◆ Works best if cash inflows are reasonably constant and predictable

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Matching Currency - Continued

- ◆ Could also use the foreign currency to pay expenses to a third party (currency switching)
- ◆ Works best if cash inflows are reasonably constant and predictable

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Back-to-Back Loans or Parallel Loan or Credit Swap

- ◆ Two firms both in two countries borrow from each other and agree to return the currencies at a later time
- ◆ No transaction exposure is created
- ◆ Example: Suppose a German firm wants to send money to a German sub in Japan and a Japanese firm wants to send money to a Japanese sub in Germany

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Example of a Back-to Back Loan

In Germany

German parent



Japanese sub

In Japan

Japanese parent



German sub

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Example - Continued

- ◆ In this example the German parent loans Euros to the Japanese sub and the Japanese parent loans Yen to the German sub
- ◆ Each sub must repay in the same currency as it received - no transaction risk on either loan
- ◆ Of course it is difficult to find a partner who has the exact opposite desires as your firm

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Currency Swap

- ◆ Suppose there is a Japanese firm that borrows in Japan but would prefer to borrow in dollars but since it is not known in the U.S. it would be expensive to borrow there
- ◆ The Japanese firm could contact a swap dealer who could arrange to have the Japanese firm service the debt in dollars

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Currency Swap - Continued

- ◆ Meanwhile the swap dealer would try and find a U.S. firm that had the opposite wish - to service debt in Yen. The U.S. firm would borrow dollars but swap its payments so that it was paying in Yen
- ◆ This arrangement is attractive if both firms have regular inflows in each other's currency

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