Global Financial Markets

Fall 2013

Stephen Sapp


I'VE GOT A STOCK HERE THAT COULD REALLY EXCEL
REALLY EXCEL?
EXCEL?
SELL?
SELL?
SELL
SE
SELL!
SELL!
ELL!
SELL!
SELL!
SELL!
THIS IS MADNESS! I CAN'T TAKE ANYMORE
GOOD BYE!
GOOD BYE?
BYE?
Buy?
Buy!
Buy!
BUY!!
Buy!
Buy!
I'VE GOT A STOCK HERE..

What is a Market?

- A *market* is any system, institution, procedure and/or infrastructure that brings people together to trade goods, services and/or information.

- Competition is required in a market. It differentiates a market from straight trade between individuals.
  - As more people want to trade, markets and competition develop.

- The willingness of buyers and sellers to transact at different prices determines the price, the market clearing price.
  - This helps to efficiently allocate resources to those willing to pay the most and get the most from each asset.

What are Financial Markets?

- *Financial markets* bring people together to buy and sell financial securities, commodities, and other *fungible* financial assets with low transaction costs.
  - Financial markets develop as more people want to buy and sell the financial assets.
  - Why are some securities sold Over-the-Counter (OTC)?

- Prices are determined by the current and future expected supply and demand for different assets. Supply and demand depend on the nature of the expected cashflows.

- Markets require a degree of trust between the buyer and seller. How does that trust develop?

Examples of Financial Markets

- Standard markets
  - Stock, bond, foreign exchange and commodity
  - Derivatives – futures, forwards, options and swaps
- Alternative markets
  - Islamic Finance
    - a system of banking or banking activities that are consistent with Islamic law (Sharia) principles and guided by Islamic economics.
  - Microfinance
    - loans, savings, and other basic financial services to small investors.
    - Crowd financing…
  - Other?

Types of Financial Markets

- Capital markets (stock, bond etc.)
  - Unites suppliers and demanders of capital
- Foreign exchange markets
  - Conversion of currencies to facilitate trade or, increasingly, to speculate.
- Commodity markets
- Derivatives markets (futures, options, swaps etc.)
  - Their value is based on the value of another financial asset (is “derived” from a relationship to another financial asset)
  - Derivative products are financial products which are used to control risk or, in some cases, to exploit risk.

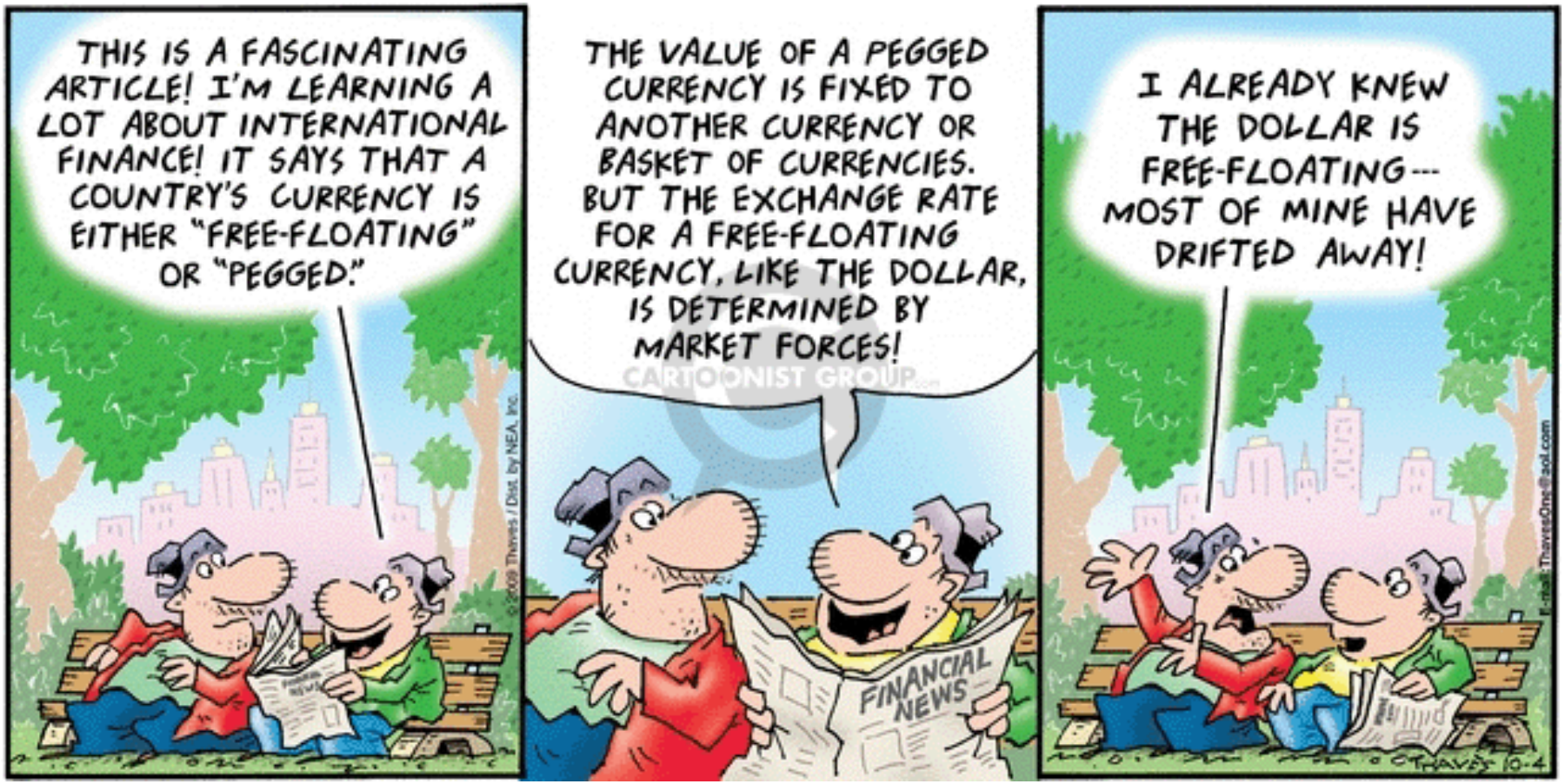
Functioning of Financial Markets

- Financial markets are inter-connected (coupled?)
  - In Canada, the stock market and Canadian dollar increase in value as the price of commodities increases.
  - In the US, the stock market and US dollar decrease in value as the price of commodities increases.
- In general, stock markets increase in value as interest rates decrease. Why?
- Are these “hard and fast” rules for financial markets?
  - January 2012: equities went down, commodities went down, the US dollar was steady and bond yields went down!
- We will start by discussing the FX market.

Do We Need a Market for Currencies?

- People need currencies to buy and sell goods. The FX market developed as trade increased and there was growth in demand to buy and sell currencies.
  - Transfer of Purchasing Power
    - Example: A British firm buys US equipment; this requires the exchange of pounds for U.S. dollars.
  - Hedging of Foreign Exchange Risk
    - There are contracts that allow market participants to convert currencies at a known rate on a future date.
- Participants
  - Mainly banks, importers, and exporters.
  - Recently speculators, hedge funds, and other large institutional investors have also entered. Why?

Currency Markets



Factors Affecting the Exchange Rate

- With a floating currency, the exchange rate is determined by supply and demand.

- If consumers want Canadian “products” they will buy Canadian dollars. This increases the demand for dollars and thus the Canadian dollar will appreciate in value.
  - Current account vs capital account? Balance of payments? (India at present?)
  - Politics? If investors are concerned about the Canadian political situation, they will sell their Canadian assets and thus sell Canadian dollars. This increases the supply of Canadian dollars and thus decreases its value.
  - What happens as uncertainty increases about Greece?
  - What happens if the price of oil increases?

- What is the role of a Central Bank or Monetary Authority?
  - How does this influence the value of the currency?

Factors Affecting the Exchange Rate

- The role of economic forces such as: inflation and interest rates?
  - If inflation is higher in Canada than elsewhere, the value of the Canadian dollar will decrease faster than other currencies.
  - If interest rates are higher (after adjusting for inflation) in Canada, investors may choose to invest in Canada in the short-term increasing demand for the dollar.
- What do higher interest rates in Canada imply about investing in Canada?
  - Why would Canadian interest rates increase? What about in the US? In Mexico? In China?

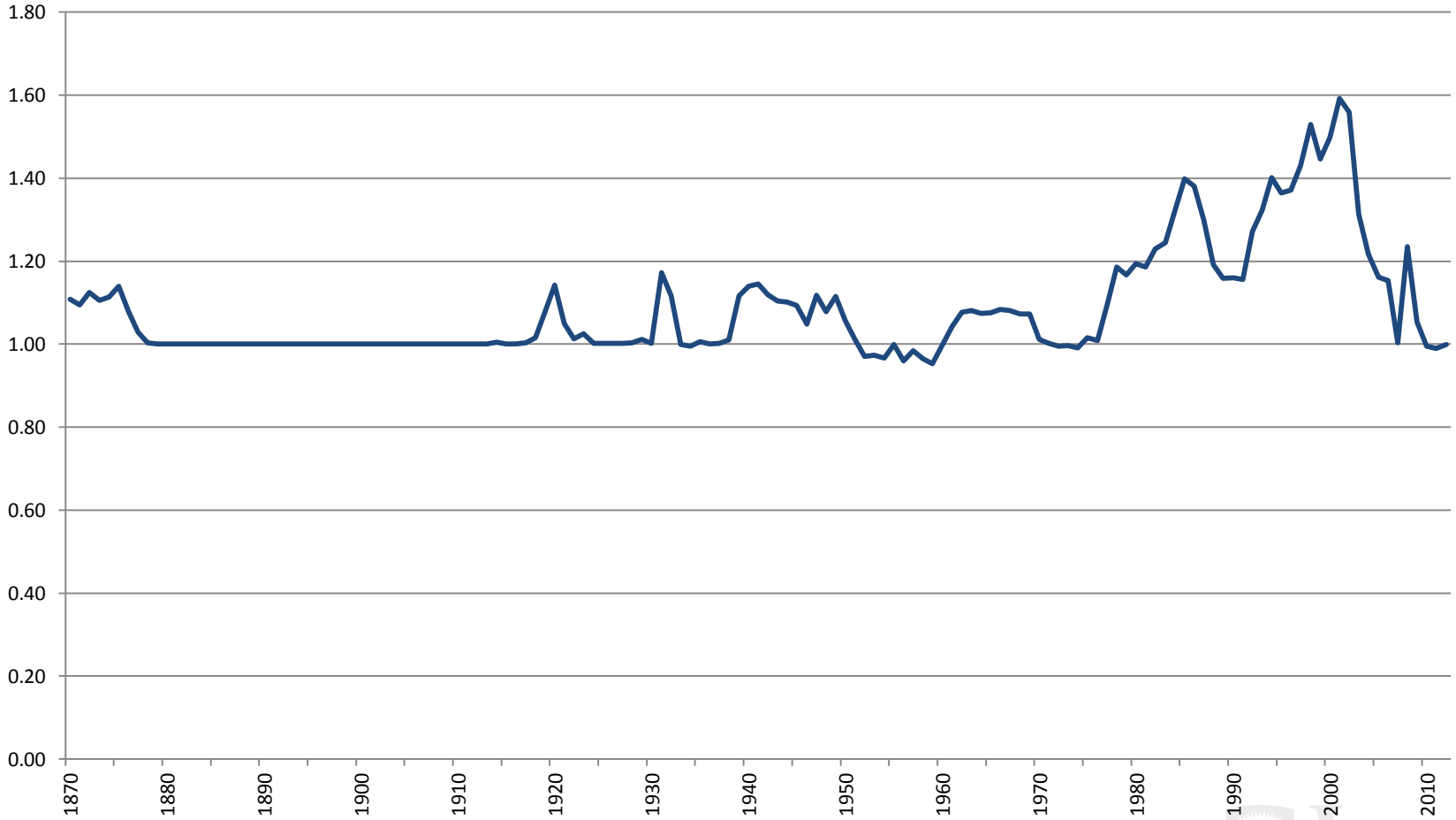
History of the Foreign Exchange Market

- Following WW II, the world's major currencies were fixed relative to the U.S. dollar (Bretton Woods). Changes were rare and the result of sustained imbalances in global capital flows.
- Since 1973 many of these currencies have been floating and attempts to explain and predict their movements have been largely unsuccessful.
- Currently the foreign exchange (FX) market is the largest financial market in the world operating 24 hours a day 7 days a week (mainly in Tokyo, London and NY):
  - Avg trading volume in 2010 was $5.1 trillion US dollars/day
    - 37% in the spot market,
    - 57% in the forward and swap markets, and
    - 5% in options

History of the Canadian Dollar

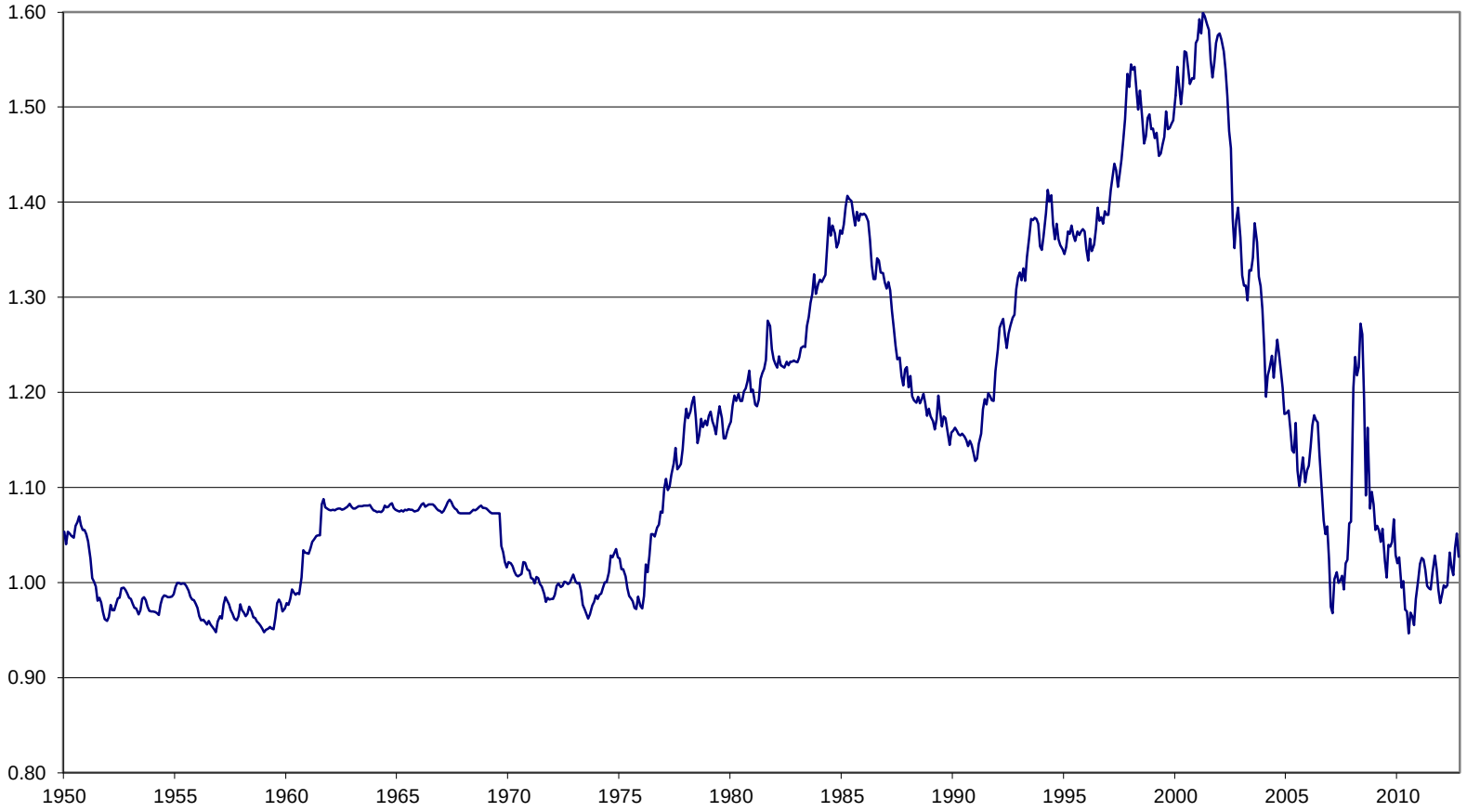
- Created for the Province of Canada in 1854 to facilitate trade. Set at a fixed exchange rate versus gold. This lasted until 1914.
  - Due to the war, the government froze gold's convertibility and the ability to move it abroad.
- Re-instated the Gold Standard in 1926, but broke down again in 1929.
- Bretton Woods "fixed" or "pegged" the value of major currencies against the U.S. dollar after World War II (in 1944).
- Except … in Canada we had "flexible" or "floating" exchange rate from 1950 until 1961. In 1961 reverted to a "fixed" exchange rate.
- "Floating" exchange rate since 1970 (other major currencies have been floating since 1972 and 1973).

Canada – US dollar, 1870 to present



Source: GlobalFinancialData.com and Bank of Canada

Canada – US dollar, 1950 to present

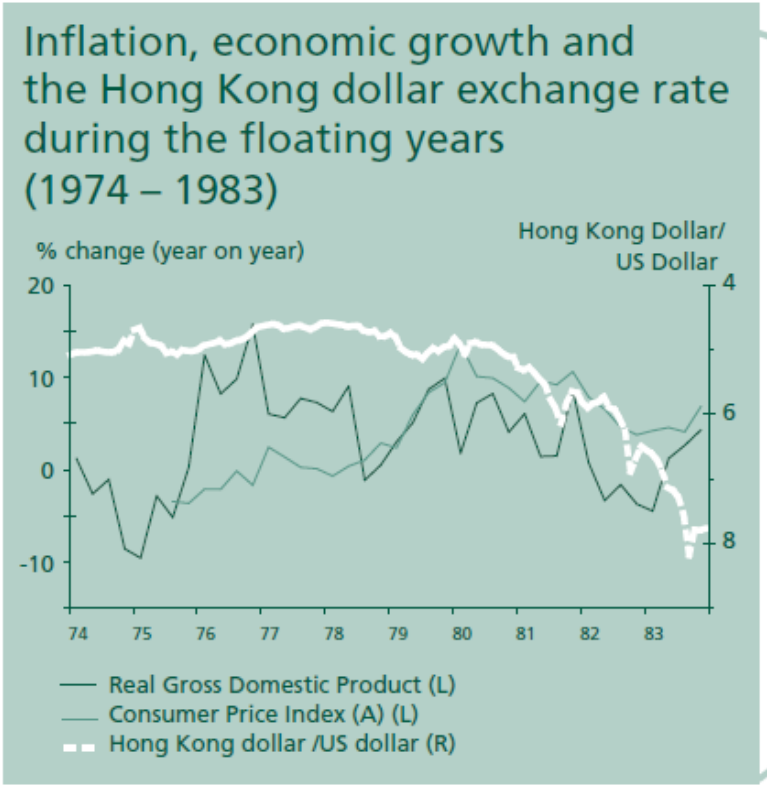


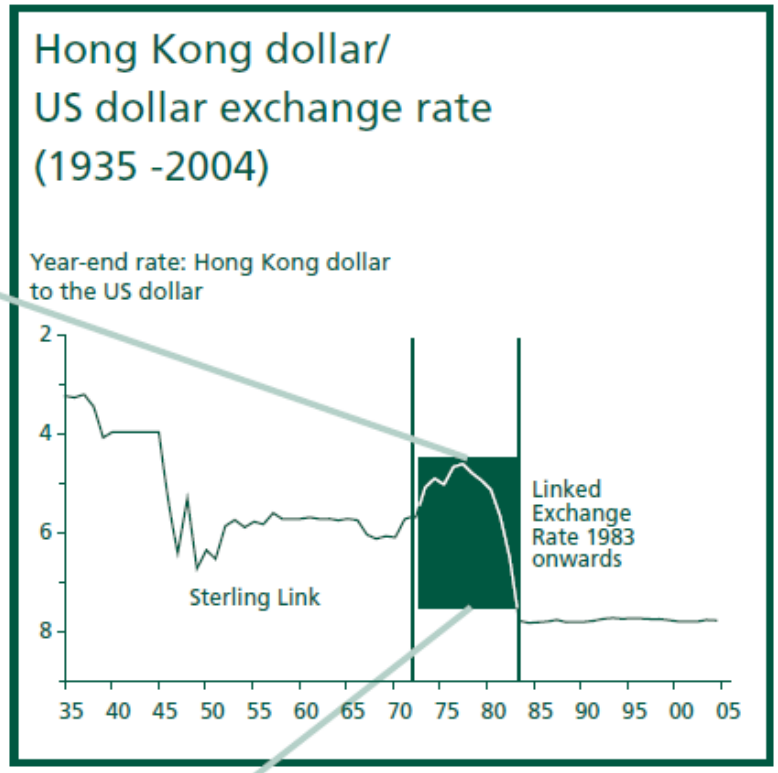
Source: Bank of Canada

History of the Hong Kong Dollar

- The Hong Kong Dollar (HKD) has been fixed relative to something for much of its existence.
- The first HKDs were linked to silver from 1866 to 1935.
- Following a crisis in the value of silver in 1935, it was linked to the British Pound.
- When the Pound was floated in 1972, the HKD was linked to the US dollar at different values in 1972, 1973 and 1974.
- The HKD was allowed to float from 1974 to 1983.
- In 1983 with inflation and bank crises, the HKD was pegged to the US dollar.

History of the Hong Kong Dollar





Source: www.hkma.gov.hk/media/eng/publication-and-research

Location of FX Trading Activity

	2004		2007		2010	
	Amount	Share (%)	Amount	Share (%)	Amount	Share (%)
United Kingdom	$753	31.3	$1,359	34.1%	$1,854	36.7%
United States	$461	19.2	$664	16.6%	$904	17.9%
Japan	$199	8.3	$238	6.0%	$312	6.2%
Singapore	$125	5.2	$231	5.8%	$266	5.3%
Germany	$118	4.9	$99	2.5%	$109	2.1%
Switzerland	$79	3.3	$242	6.1%	$263	5.2%
Hong Kong	$102	4.2	$175	4.4%	$238	4.7%
France	$63	2.6	$120	3.0%	$152	3.0%
Australia	$81	3.4	$170	4.3%	$192	3.8%
Netherlands	$49	2.0	$24	0.6%	$18	0.4%
Canada	$54	2.2	$60	1.5%	$62	1.2%
Italy	$20	0.8	$36	0.9%	$29	0.6%
Other countries	$302	12.6	$571	14.3%	$692	12.2%
Total	$2,406	100.0	$4,281	100.0	$5,056	100.0

Source: Bank for International Settlements

Global FX Activity by Currency

	1992	1995	1998	2001	2004	2007	2010
US dollar	82.0	83.3	87.3	90.4	88.7	86.3	84.9
Euro	-	-	-	37.6	37.2	37.0	39.1
Deutsche Mark	39.6	36.1	30.1	-	-	-	-
French Franc	3.8	7.9	5.1	-	-	-	-
Other EU currencies	11.8	15.7	17.3	-	-	-	-
Japanese Yen	23.4	24.1	20.2	22.7	20.3	16.5	19.0
Pound Sterling	13.6	9.4	11.0	13.2	16.9	15.0	12.9
Swiss Franc	8.4	7.3	7.1	6.1	6.1	6.8	6.4
Canadian Dollar	3.3	3.4	3.6	4.5	5.5	4.2	5.3
Australian Dollar	2.5	2.7	3.1	4.2	4.2	6.7	7.6

Note: these add to 200% because each foreign exchange transaction involves two currencies

Source: Bank for International Settlements

FX Terminology (cont'd)

- **American terms**
  - number of $US *per unit of foreign currency*
  - e.g., $US 0.8614 = $CAD 1.00 *or* 0.8614 USD/CAD
- **European terms**
  - number of foreign currency units *per $US*
  - e.g., $CAD 1.1609 = $US 1 or €0.8248 = $US 1
- **Direct quote**
  - number of *home* currency units bought with one *foreign currency* unit (e.g. $CAD 1.41 = 1EUR)

FX Terminology (cont'd)

- **Bid** – the price at which a *dealer* is willing to buy another currency.
- **Ask** or **Offer** – the price at which a *dealer* is willing to sell another currency.
  - The Bid is always smaller than the Ask. Banks make a profit from the spread between the rates at which they are willing to buy and sell (why is there a spread?).
  - The "rip-off rule" can be used to help identify the buying and selling price.
    - Buy low – Sell high (for the dealers … for me?)

Direct Quotes and Cross Rates

- *Cross Rates* are exchange rates between two currencies neither of which is the US dollar (example EUR/GBP).
- *Triangular arbitrage* keeps these exchange rates in line with exchange rates quoted relative to the dollar.
- Example: Suppose that the pound sterling is $1.9800-20 in New York and the Euro is $0.9250-55 in Frankfurt. At the same time London banks are offering pounds sterling at Euro 2.1390-95 (€ / £).
  - Cross-rates can be calculated to be: 2.1394 – 2.1427

Computing Cross Rates

1/0.9250 = 1.081 (E/$)

1/0.9255 = 1.080 (E/$)

What is the implied Euro/Pound cross rate?

- We know: 1.9800-20 USD/GBP and 0.9250-55 USD/EUR
- Cross-rate Bid = How many Euros would you get if you sold a Pound? (the price the bank will pay you in Euros to buy a Pound)
  - You sell 1 pound to get dollars, convert these dollars to Euros.
- Bid = 1.9800USD/GBP, then convert the 1.98 USD you would have from the Pound you sold to Euros:

  $1.98\text{USD} \times 1/0.9255\ \text{USD/EUR} = 2.1394\ \text{EUR for 1 GBP}$

- Cross-rate Ask = How many Euro for you to buy a Pound?
  - Sell Euros to buy 1 Dollar, convert these to Pounds
- Ask = $1/0.9250\ \text{USD/EUR} \times 1.9820\ \text{USD/GBP} = 2.1427\ \text{EUR/GBP}$

Terminology

What are Eurodollars?

- U.S. dollar-denominated assets held in a bank *outside the US* (Note: this is different from the Euro, €).
  - The bank may be a foreign bank or the overseas branch of a US bank.
- This started in the 1950's during the Cold War.
  - The Soviet Union no longer wanted to hold its US dollar reserves at the Federal Reserve Bank of NY. The reserves were left in Western Europe, mainly London.
  - Being held outside the US these funds remain beyond the influence of the Fed and thus not at risk of being "frozen".

Terminology (cont'd)

What is the Eurocurrency market?

- The system of international banks which hold deposits or issue bonds/loans in any currency outside its domestic market (e.g., EuroYen are Japanese Yen outside of Japan).
  - Centered in London, but not limited to London or Europe.
- Thrives because it remains relatively free from government interference and has significant competition.
- LIBOR (London Interbank Offered Rate) is based on the interest rate charged on Eurocurrency loans between banks in London (LIBOR scandal?).
  - Also FIBOR (Frankfurt), PIBOR (Paris), HKIBOR (Hong Kong)…

Types of Transactions

- Spot currency trading
  - A spot transaction involves payment of one currency and receipt of another in 2 business days (one business day for the North American currencies).
    - One day for back office paperwork and a second day because of time zone differences.
  - It is the most active part of the foreign exchange market.

Current Spot Rates

Benchmark Currency Rates								
	USD	EUR	JPY	GBP	CHF	CAD	AUD	HKD
USD		1.3383	0.0101	1.5569	1.0847	0.9528	0.9030	0.1290
EUR	0.7473		0.0076	1.1632	0.8100	0.7114	0.6747	0.0963
JPY	98.72	132.10		153.69	107.06	94.05	89.11	12.7304
GBP	0.6423	0.8595	0.0065		0.6967	0.6119	0.5800	0.0828
CHF	0.9222	1.2332	0.0093	1.4363		0.8785	0.8325	0.1189
CAD	1.0496	1.4048	0.0106	1.6341	1.1385		0.9478	0.1354
AUD	1.1075	1.4822	0.0112	1.7241	1.2018	1.0550		0.1428
HKD	7.7548	10.3787	0.0785	12.0725	8.4055	7.3879	6.9968	

Source: www.Bloomberg.com August 23, 2013

Types of Transactions (cont'd)

- Forward contract
  - A forward transaction involves both the payment of one currency and the receipt of another at a set point in the future. No upfront payment is required. The most commonly used maturities are 30, 60, 90 or 180 days. Negotiated with a financial intermediary according to your needs.

- Futures contract
  - A futures contract is similar to a forward contract except that it involves a standardized quantity (e.g. €125,000) and standardized settlement dates (e.g. the last day of March, June, Sept and Dec). This standardization allows futures to be traded on exchanges. Futures require a small upfront payment and are marked-to-market.

Futures Quotations (CAD/USD)

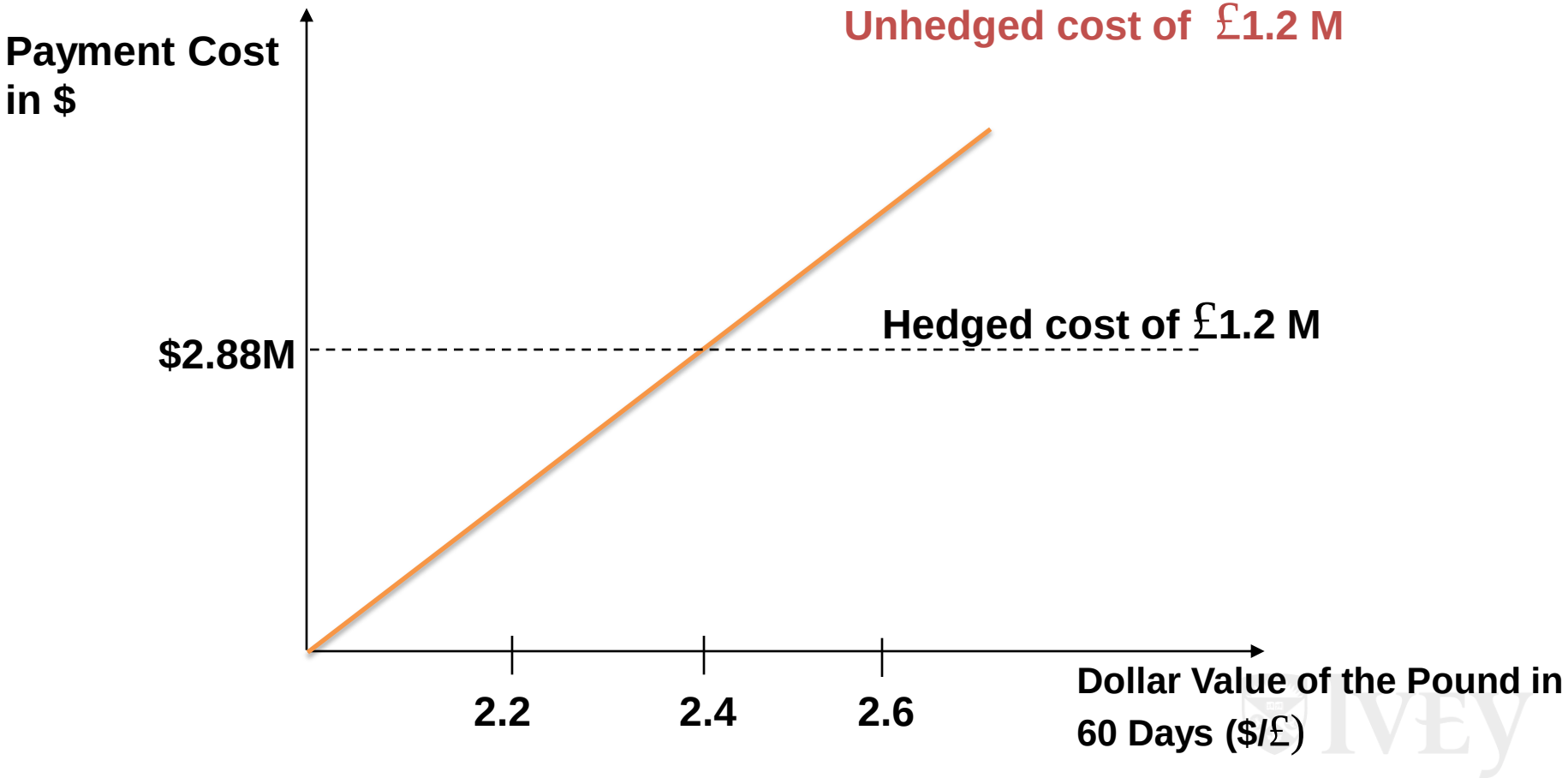
Month	Last	Volume	Open Interest
Sept-13	0.9502	75,508	113,765
Dec-13	0.9481	1,513	7,578
Mar-14	0.9462	109	908
June-14	0.9420	35	331
Sept-14	0.9427	25	70

Source: www.cmegroup.com August 23, 2013

Examples: The Forward Market

- A Canadian company imports £1.2 M worth of cars from England. This amount has to be paid in 60 days.
- Since the price of the pound might vary over the 60-day period, the Canadian company is subject to exchange rate risk.
- This risk can be avoided by entering into a 60-day forward contract at, say, a rate of £1 = $2.4.
- According to this contract, in 60 days the Canadian firm will pay $2.88 M to the bank and receive £1.2 M with which it can pay the British company (Note: $2.88M = £1.2 M × 2.4 $/ £).

The Forward Market



Types of Transactions (cont'd)

Options

- A foreign currency option gives the buyer of the option the right but not the obligation to buy or sell a specified amount of foreign currency at a given exchange rate.

- Call Option
  - Gives the right to ***buy*** a specific amount of foreign currency at the exchange rate stated in the contract.
- Put Option
  - Gives the right to ***sell*** a specific amount of foreign currency at the exchange rate stated in the contract.

Foreign Currency Options Quotations

Option And Underlying	Strike Price	Calls-Last Sep	Calls-Last Oct	Calls-Last Nov	Puts-Last Sep	Puts-Last Oct	Puts-Last Nov
10,000 USD CAD cents per USD	103.00	2.35	2.60	2.89	0.19	0.42	0.62
	103.50	1.90	2.25	2.54	0.30	0.57	0.78
	104.00	1.55	1.92	2.22	0.45	0.75	0.98
	104.50	1.24	1.62	1.93	0.65	0.95	1.21

Source: www.m-x.ca August 2013

- What factors influence the value of options?

Examples: Foreign Currency Options

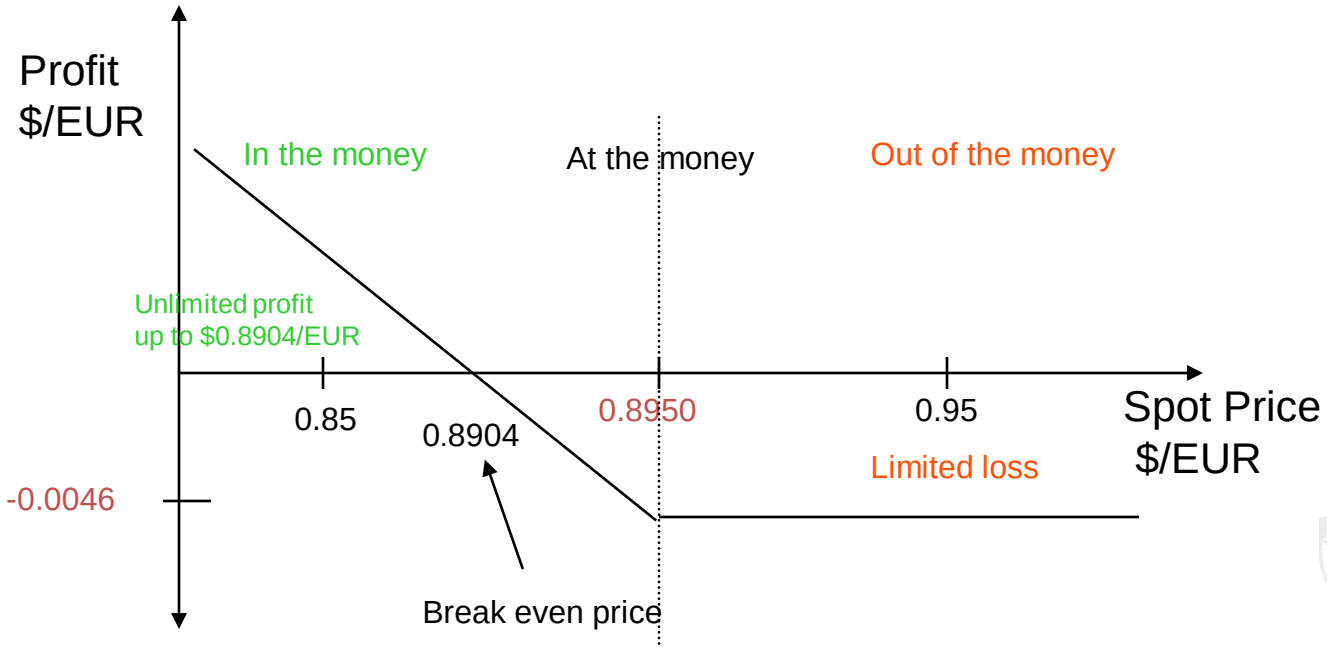
- A German company is purchasing computer equipment for US$12.5 million. This has to be paid in 6 months.
- Since the price of the Euro has been fluctuating significantly over the past year, the German firm is worried about this risk.
- The CFO believes the Euro can not got down much further, but he can not afford to have the chips cost any more.
- He can limit the increase in cost if the Euro continues to depreciate against the U.S. dollar, and profit if the Euro appreciates against the U.S. dollar by buying an option.

Euro Put Option Against US Dollars

- Assume the current exchange rate is US$0.90/Euro
- Suppose you buy a put option on Euros with a strike price of $0.895/Euro to limit the downside of your investment.
- This gives you the right, but not the obligation, to sell Euros for dollars at the rate of $0.895/Euro.
- To buy US$12.5 million, you would need to buy about 112 put option contracts (why?).
  - This would allow the German firm to profit from an appreciation of the Euro, but not suffer too much if it were to continue to depreciate.

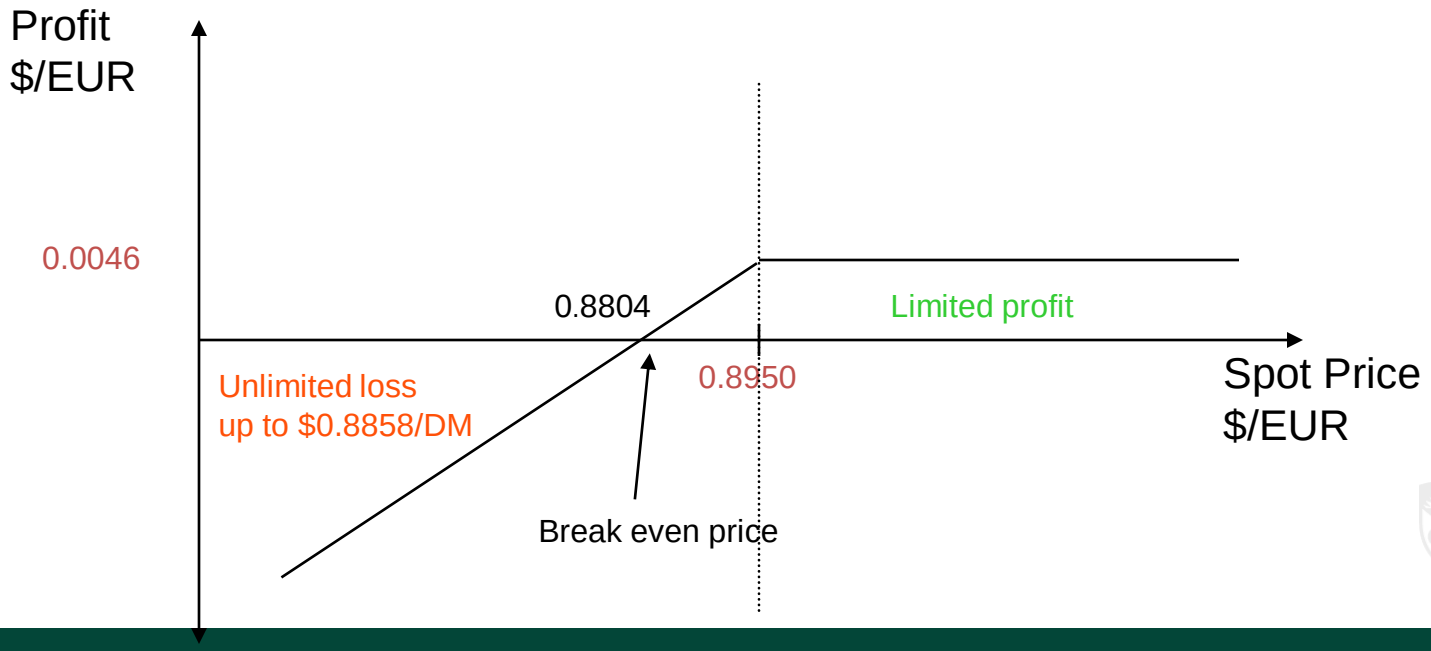
Profit / Loss for Buyer of a Put Option

Suppose you bought a January ***put option on Euros*** with a strike price of 8950 ($0.8950/EUR), which sells for $0.0046/EUR



Profit / Loss for Writer of a Put Option

Suppose you wrote a January put option on Euros with a strike price of 8950 ($0.8950/EUR), which sells for $0.0046/EUR



Types of Transactions (cont'd)

Swaps

- Simultaneous sale and purchase of contracts in different currencies with different maturities.

- *Credit market swaps* –firms borrow the same principal but in different currencies. They make the other's payments. This allows firms to effectively have a liability in a different currency, without having to go to the foreign market.

- *Foreign Exchange swaps* – one firm simply exchanges one currency for another today (or some day in the future) for the reverse in the future with another firm. The firms do not need to go to the FX market.

Comparison of Hedging Strategies

- A British company submitted a bid stating that it will pay €100M for 75% of the common stock of a French company. The British firm is unsure whether the French investors will tender to it or to a rival bidder. What should it do?

  - Hedging options:
    - a Forward Contract
    - a Futures Contract
    - an Options Contract

  - What happens if the firm does not win the tender?

Summary

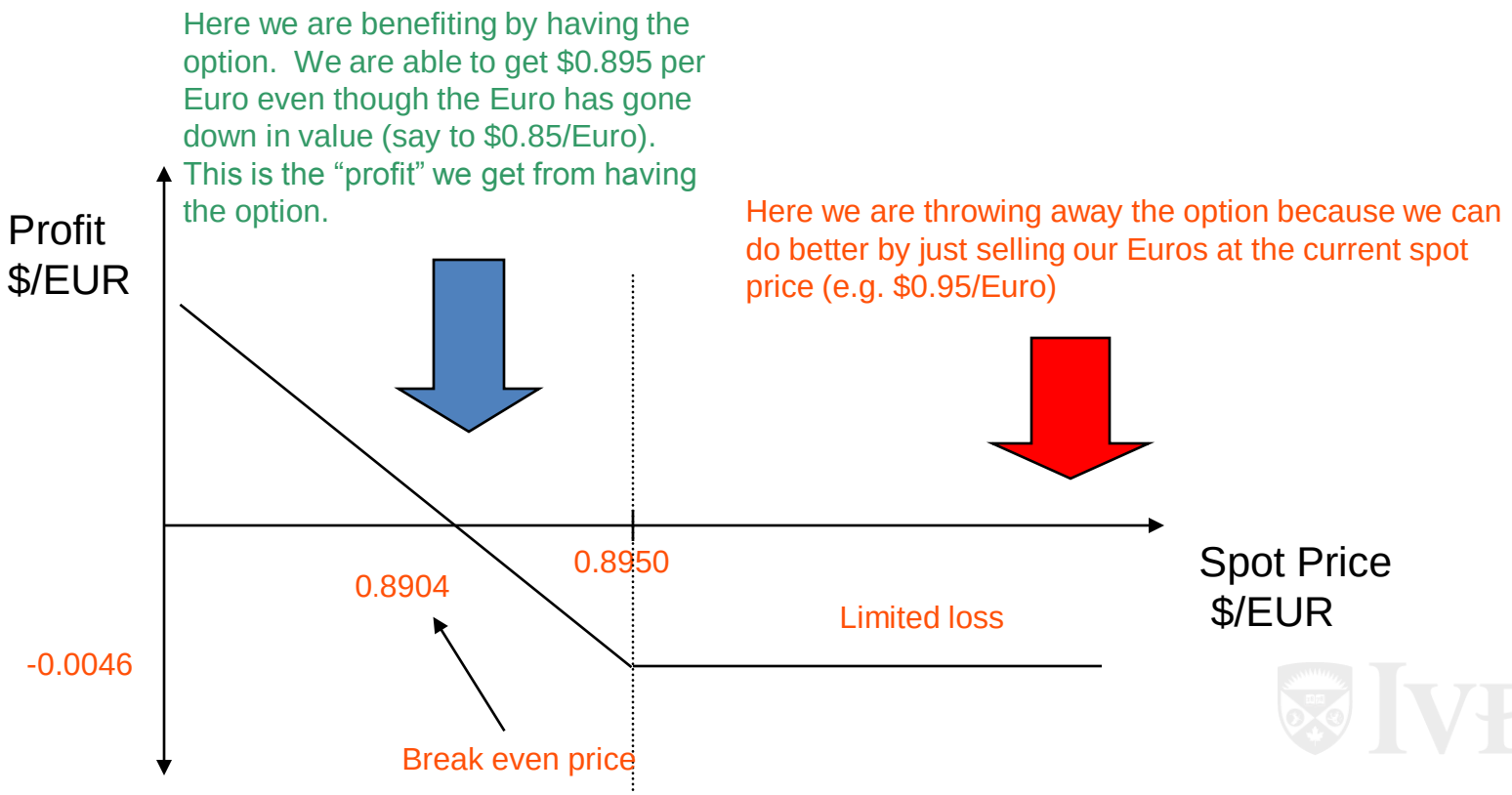
- Spot contracts are for an “immediate” transfer of currency.
  - It is the largest market and the one most people think of when talking about the foreign exchange market.
- Forward (and futures) contracts are such that a set amount of currency changes hands at expiration, a set future date.
- Options contracts are such that the buyer pays the seller at initiation for the right to exercise in the future.
- Swap allows benefits from mutual coincidence of wants.
  - The forward contract is a firm commitment – it must be completed. The options contract is at the buyer’s discretion.

Supplementary Discussion: Euro Put Option Against US Dollars

- When looking at the diagrams presented earlier, we need to think about what using the options really means to investors. For example
  - If the Euro continues to weaken and goes to $0.85 per Euro, we would have to sell more Euros to buy our $12.5 million than we would have to by using the option – we could sell each Euro and get $0.895 using the option.
    - This means we are actually saving money or we can say we are profiting by having the option and using it!
  - If the Euro strengthens and goes to $0.95 per Euro, we would be better off by ignoring our option and selling our Euros to get $0.95 per Euro.
    - By “throwing away” the option, this means we are losing what we paid for the option but we are getting more dollars per Euro this way.
  - Now, let’s go to the graph for the put option.

Profit and Loss for Buyer of a Put

Suppose you bought the January put option on Euros with a strike price of 8950 ($0.8950/EUR), which sells for $0.0046/EUR



Supplementary Discussion: Euro Call Option Against US Dollars

- With respect to a call, things get reversed. The call is for *buying* Euros with US dollars (not *selling* Euros as was the case for the put).
  - If the Euro continues to weaken and goes to $0.85 per Euro, it would take fewer US dollars to buy Euros at this exchange rate than if we were to exercise the option and buy each Euro for $0.895. As a result, we would not use the option – why would we pay more than we have to for the Euros?
    - This means we would be spending more than we have to in order to get the Euros if we used the option. As a result we should just throw away the option and lose what we paid for it.
  - If, however, the Euro strengthens and goes to $0.95 per Euro, it would cost us more dollars to buy the Euros and we would be better off using the option and buying Euros for $0.895 per Euro.
    - This means we are profiting by having the option!
  - Now, let's go to the graph for the call option.

Profit and Loss for Buyer of a Call

Suppose you buy a January call option on Euros with a strike price of 8950 ($0.8950/EUR), which sells at $0.0092/EUR

Here we are throwing away the option because we can do better by just buying our Euros at the current spot price (e.g. $0.85/Euro)

Here we are benefiting by having the option. We are able to buy Euros for $0.895 rather than having to go through the market and pay, say, $0.95 per Euro. This is the "profit" we get from having the option.