Slides for International Finance
Financial Globalization (KOMIE 20/KOMIF 9)

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Preview

- ▶ Different Types of Gains from Trade
- ▶ International Capital Markets and Banking
- ▶ Policy constraints and international financial markets
- ▶ Banking and financial fragility
- ▶ Regulation of international financial markets
- ▶ Concepts of market efficiency

Rapid Expanison of Financial Interlinkages

1960s: most US banking purely domestic

but by the 1980s:

- ▶ substantial international banking
- ▶ US banks have branches all over the world
- ▶ growing role for nonbank financial institutions

International Capital Market

Globally dispersed & electronically connected financial centers:

- ▶ London, Tokyo, New York, Singapore, etc.

Markets in diverse assets, including

- ▶ real estate, factories, equipment
- ▶ equity and debt (stocks and bonds)
    - ▶ foreign exchange (FX)
        - ▶ FX derivatives
        - ▶ forwards, futures, swaps, options

Types of Gains from Trade

Three Types of Gains from Trade

comparative advantage exchange of goods and services

portfolio diversification exchange different types of assets to optimize returns/risk

intertemporal trade exchange commodities for assets

- ▶ assets are claims on future production of goods and services
- ▶ consumption smoothing
- ▶ investment opportunities

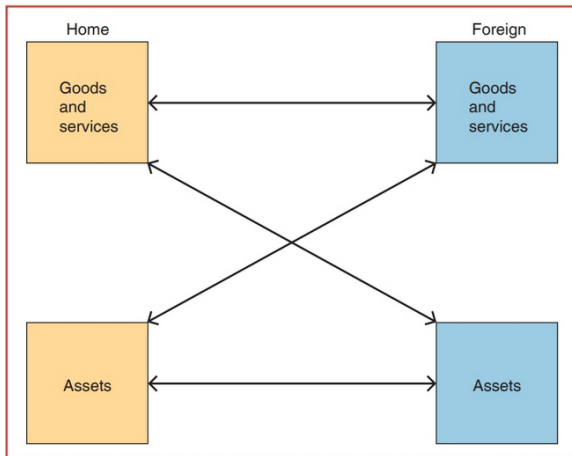# The Three Types of International Transaction Trade

Figure Source: KOMIF Fig 20-1

Absolute Advantage: Adam Smith in The Wealth of Nations (1776):

> "If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it off them with some part of the produce of our own industry employed in a way in which we have some advantage. The general industry of the country, being always in proportion to the capital which employs it, will not thereby be diminished [...] but only left to find out the way in which it can be employed with the greatest advantage."

Comparative Advantage: Background (cont.)

Comparative Advantage: David Ricardo in *On the Principles of Political Economy and Taxation* (1817)

Two countries, Portugal and England, each producing two goods of identical quality, with internationally immobile capital and labor.

Labor hours required to produce one unit:

Country	Cloth	Wine
England	100	120
Portugal	90	80

Portugal is more efficient: it uses less labor than England. However, England is *relatively* better at making cloth, so it exports cloth for wine. If a unit of cloth buys a unit of wine, England now gives up only 1 unit of cloth instead of 1.2 units. Portugal now gives up only 1 unit of wine per unit of cloth instead of 1.125 units.

Gains from Comparative Advantage

Exchange of goods and services allows countries to:

- ▶ Specialize in production
  - ▶ Export what you are relatively good at producing
- ▶ Enlarge consumption opportunities
  - ▶ Trade for things not produced
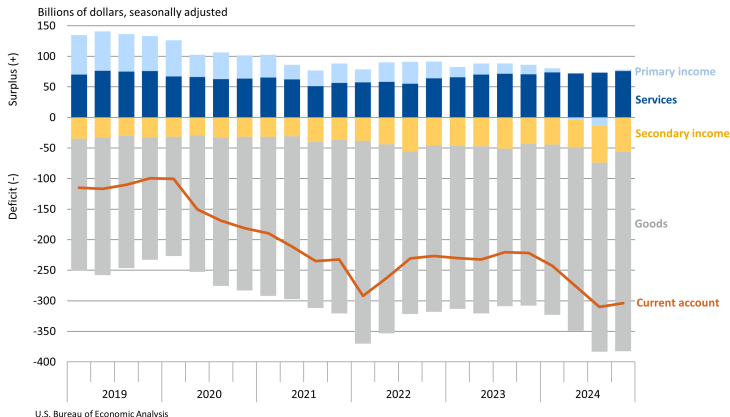
US Exports and Imports

Source: https://fred.stlouisfed.org/graph/?g=12OZv
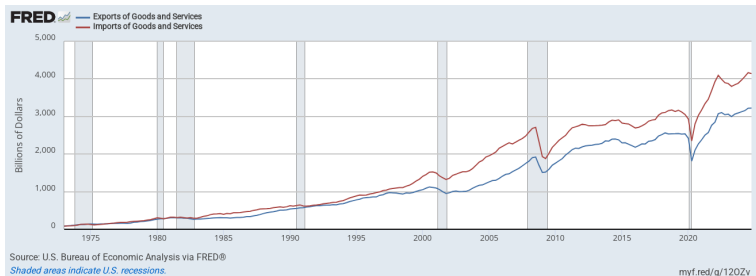
US Current Account (Review)

Remember: the US still has a surplus on services.

Chart 1. Quarterly U.S. Current Account and Component Balances

Source: BEA

Gains from Portfolio Diversification

Classification of Assets
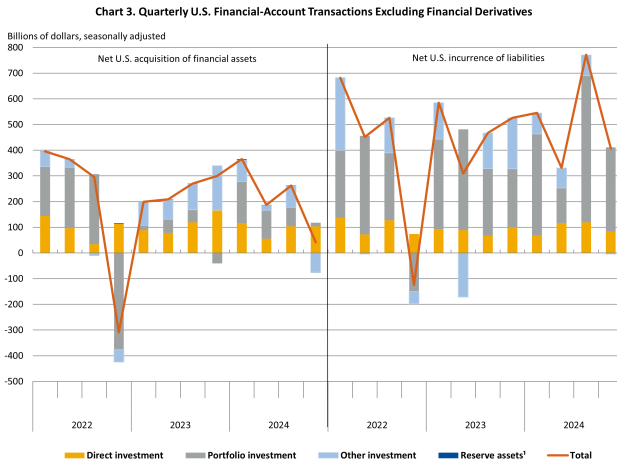
Assets can be classified as either

Debt instruments

- ► Examples include bonds and deposits
- ► They specify that the issuer must repay a fixed amount regardless of economic conditions.

Equity instruments

- ► Examples include stocks or a title to real estate
- ► They specify ownership (equity = ownership) of variable profits or returns, which vary according to economic conditions.

Assets for Assets, and Then Some

Chart 3. Quarterly U.S. Financial-Account Transactions Excluding Financial Derivatives

Source: https://www.bea.gov/system/files/
trans424-chart-03.png

Still, some economists argue that it would be optimal if investors diversified more by investing more in foreign assets, avoiding the "home bias" of investment.

Gains from Portfolio Diversification

Exchange of domestic assets for foreign assets:

- ▶ Can improve return/risk tradeoffs
    - ▶ add foreign assets -> more diversification
- ▶ Most investors are "risk averse"

The Potato Economy

Your textbook talks of a kiwi economy. But one can live a long time on (mostly) potatoes.

(Better yet: mashed potatoes with milk. Even so: not recommended.)

The Potato Economy: Expected Value

Consider a country with an agricultural sector.
Bad and good weather are equally likely (both with probability 1/2).

- ▶ with good weather the land can produce 100 tonnes of potatoes.
- ▶ with bad weather the land can produce 50 tonnes of potatoes
- ▶ On average, the land will produce 1/2 * 50 + 1/2 * 100 = 75 tonnes

Note
Statisticians define expected value (or *mean*) as the probability
weighted sum of possible outcomes. In this statistical sense, the
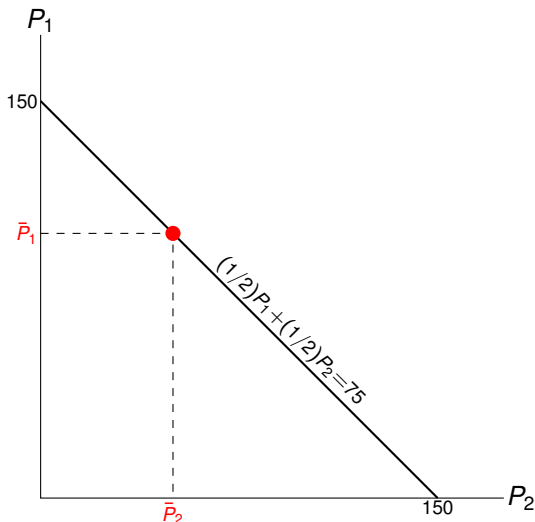expected value of the yield is 75 tonnes.

Potato Production: Home Country Endowment

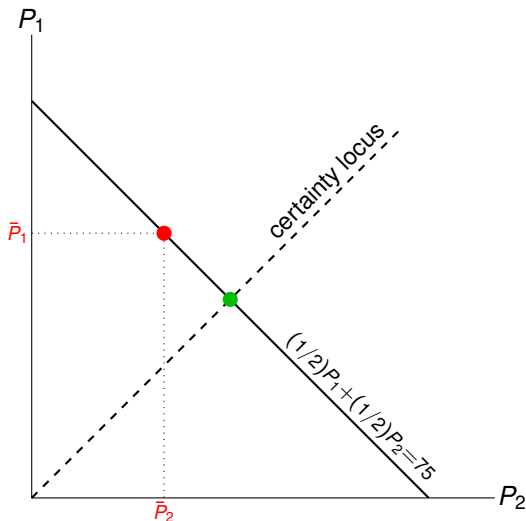Two states of the world: state 1 and state 2. Let P_i be the potato production in state i.
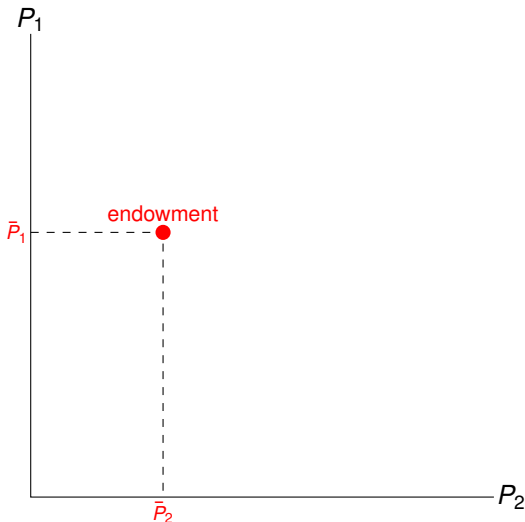
Potato Production: Home Country Fair-Odds Line

Find all the combinations with the same expected value (*given* that the two states are equally likely). This is the fair-odds line.

Expected Value and Risk Aversion

Risk averse consumers prefer the expected value with certainty.

Portfolio Diversification

Now suppose two countries, Home and Foreign. Suppose

- ▶ Identical ag sectors except . . .
- ▶ negatively correlated weather
- ▶ Historical records show that when the domestic country has good weather (high yields), the foreign country has bad weather (low yields).
    - ▶ assume that the future will be like the past.

Potato Production: Foreign Country Expected Value

Find all the combinations with the same expected value (given that the two states are equally likely).
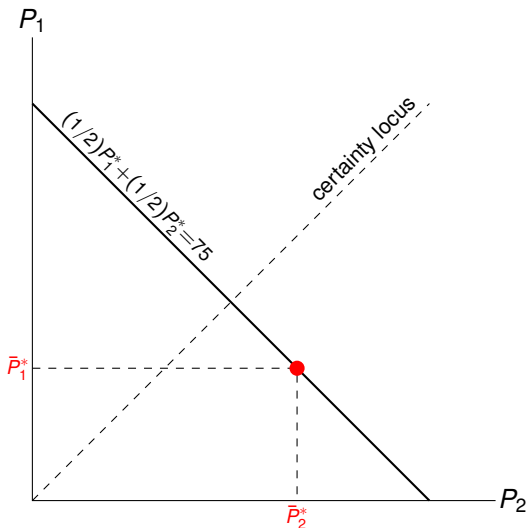
Portfolio Diversification

What could the two countries do to avoid suffering from a bad crop?

Asset exchange: sell 50% of one's assets to the other party and buy 50% of the other party's assets:

- ▶ diversify the portfolios of assets so that both countries always achieve the portfolios' expected (average) values.

Portfolio Diversification (cont.)

Portfolio diversification: both countries can always enjoy a moderate potato yield and not experience the vicissitudes of feast and famine.

► If the domestic country's yield is 50 and the foreign country's yield is 100 then both countries receive: 50%*50 + 50%*100 = 75.

► If the domestic country's yield is 100 and the foreign country's yield is 20 then both countries receive: 50%*100 + 50%*50 = 75.

► If both countries are risk averse, then both countries could be made better off through portfolio diversification.

Gains from Intertemporal Trade

Gains from Intertemporal Trade

Saving and dis-saving via CA: Exchange today's goods and services for claims on future goods and services (assets)

Consumption smoothing
- lend when income unusually high
- borrow when income unusually low

Investment opportunities
- lend if opportunities lacking
- borrow to finance investment

Feldstein-Horioka Puzzle

Some countries should borrow abroad:

- ▶ to finance unusually good domestic investment opportunities
- ▶ to optimally consume beyond current income

Others countries should lend abroad:

- ▶ because good domestic investment opportunities are scarce.
- ▶ to optimally save from current income

Capital mobility appears to be high: should decouple national saving and investment levels, which therefore should not be highly correlated.

However ...

Saving and Investment Rates for 24 Countries, 1990–2019 Averages

Empirically: national saving and investment levels are highly correlated.

Saving and Investment Rates for 24 Countries, 1990–2019 Averages
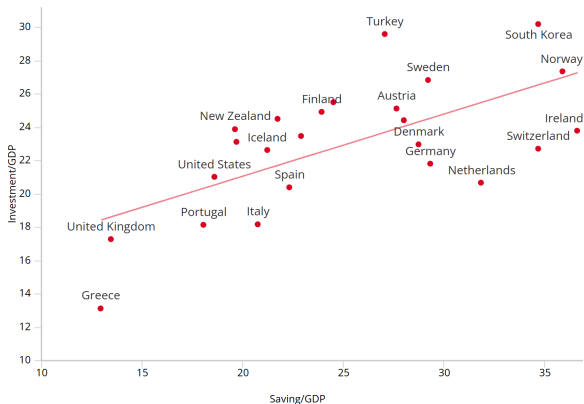
Figure Source: KOMIF Fig 20-3

Extent of International Intertemporal Trade (cont.)

▶ Are international capital markets unable to allow countries to engage in much intertemporal trade?

▶ Not necessarily: factors that generate a high saving rate, such as rapid growth in production and income, may also generate a high investment rate.

▶ Governments may also enact policies to avoid large current account deficits or surpluses.

▶ Home bias in investment choices.

BEST WISHES FOR THE ROAD AHEAD!!
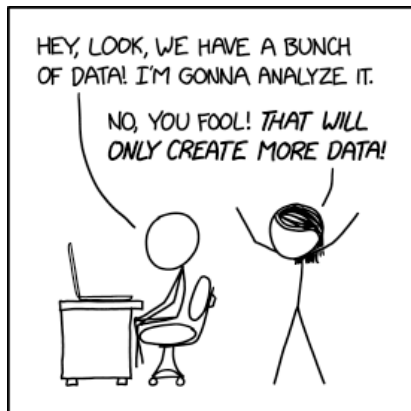
International Capital Markets

International Capital Markets: The Participants

- commercial banks and other depository institutions
- corporations
- nonbank financial institutions, including
    - insurance companies
    - money market funds
    - hedge funds
    - pension funds
- central banks and other government agencies

Commercial banks and other depository institutions:

- ▶ accept deposits
- ▶ lend to commercial businesses, other banks, governments, and/or individuals
- ▶ buy and sell bonds and other assets
- ▶ Some commercial banks underwrite new stocks and bonds by agreeing to find buyers for those assets at a specified price.

Corporations:

- ▶ MNCs may obtain foreign finance by
  - ▶ issuing stock or bonds
  - ▶ borrowing from international banks
- ▶ Other private firms may issue bonds or may borrow from commercial banks.

Non-bank financial institutions:
investment "banks", mutual funds, hedge funds, and other securities firms; pension funds; insurance companies

Investment banks specialize in underwriting securities (stocks and bonds) and in making various investments.

Mutual funds accept funds from investors and invest them in a diversified portfolio of stocks.

Pension funds accept funds from workers and invest them until the workers retire.

Insurance companies accept premiums from policy holders and invest them until an accident or another unexpected event occurs.

*Central banks and government agencies:**

- ▶ Central banks sometimes intervene in foreign exchange markets.
- ▶ Government agencies issue bonds to acquire funds, and may borrow from foreign commercial banks or securities firms.
- ▶ Sovereign wealth funds (may be held by central bank or Treasury) hold internationally diversified portfolios

Offshore Banking

Offshore banking: banking outside of the boundaries of a country.

Different types of offshore banking institutions face different regulatory environments.

Bahrain, Singapore, and Japan have regulations similar to the US for offshore banks.

Types of Offshore Banking

Agency office in a foreign country:

- ▶ makes loans and transfers but does *not* accept deposits
- ▶ $\rightarrow$ not subject to depository regulations in either the domestic or foreign country.

Subsidiary bank in a foreign country:

- ▶ follows the regulations of the foreign country
- ▶ need not follow the regulations of the home country

Foreign branch of a domestic bank:

- ▶ usually subject to both domestic and foreign regulations
- ▶ (sometimes may choose the more lenient regulations)

International banking facilities:

- ▶ foreign banks in the U.S. that are allowed to accept deposits from and make loans to foreign customers only
- ▶ not subject to reserve requirements, interest rate ceilings and state and local taxes.

Offshore Currency Trading

Offshore currency deposit: a bank deposit denominated in a currency other than that of the country where the bank resides.

- ▶ may be a deposit in a subsidiary bank, a foreign branch, a foreign bank or another depository institution located in a foreign country.
- ▶ sometimes confusingly referred to as eurocurrency deposits (because these deposits were historically dollar deposits made in European banks)

Offshore currency trading has grown for three reasons:

1. growth in international trade and international business

2. avoidance of domestic regulations and taxes

3. political factors (ex., to avoid confiscation by a government because of political events)

Offshore Currency Trading (cont.)

Historically, reserve requirements were a primary example of a domestic regulation that banks have tried to avoid through offshore currency trading.

▶ Depository institutions in the U.S. and other countries were required to hold a fraction of domestic currency deposits on reserve at the central bank.

▶ These reserves could not be lent to customers and did not earn interest in many countries, therefore the reserve requirement reduces income for banks.

▶ But offshore currency deposits in many countries were not subject to this requirement, and thus could earn interest on the full amount of the deposit.

Financial Fragility

A bank fails when it cannot meet its obligations to creditors (including depositors),

Balance Sheet for Bank

Assets

Loans

- business
- home
- car
- real estate

Marketable securities

- government bonds
- corporate bonds

Reserves

- reserves at central bank
- cash on hand ("vault cash")

Liabilities + Net worth

Deposits

- demand deposits
- time deposits

Borrowed funds

Bank Capital ("Net Worth")

How a Bank Makes Money

▶ Borrow funds short-term at a lower rate,

▶ lend them long-term at a higher rate.

The maturity mismatch creates risk.

Insolvency

A bank is insolvent when bank capital (net work) falls below 0.

Bank Run

The threat of insolvency can create a bank run.
When depositors start to worry about access to their deposits, they
may withdraw them, increasing the worries of other depositors.

Systemic Risk

Collapse of a single bank may not matter much.

But bank runs are to some extent contagious.

Collapse of many banks can have serious macreconomic consequences.

Risk taking the in banking sector creates *systemic risk*.

Policy Safeguards

1. Deposit insurance
2. Reserve Requirements
3. Capital Requirements and Asset-Riskiness Restrictions
4. Bank Examination Requirements (transparency of compliance)
5. Lender of Last Resort (LLR function of central banks)
6. Government imposed restructuring or government bailouts
   - ▶ bailouts may impose haircuts on the banks creditors

Deposit Insurance

Fractional reserve system
- only a fraction of assets liquid
- banks vulnerable to "runs"
- illiquid banks become insolvent

Deposit insurance builds confidence
- -> bank runs rare

Most countries now have deposit insurance
- US first: FDIC since 1934
- Banks pay a risk-adjusted premium to FDIC
- Depositors get insurance ($100,000 limit)
- ($250,000 coverage limit since Oct 2008

Deposit insurance

► Prevents bank panics due to a lack of information: because depositors can not determine the financial health of a bank, they may quickly withdraw their funds if they are not sure that a bank is financially healthy enough to pay for them

► Creates a moral hazard for banks to take more risk because they are no longer fully responsible for failure

Moral hazard: a hazard that a party in a transaction will engage in activities that would be considered inappropriate (e.g., too risky) according to another party who is not fully informed about those activities

Moral Hazard

Moral hazard results from
- ▶ perceived government guarantees, combined with
- ▶ weak regulation of the guaranteed institution.

This fuels excessively speculative investment.

The Algebra of Moral Hazard: Example

A potential investment costs \$70 million up front, but has the following revenue streams.

state	probability	revenue	profit
good state	$p = 1/3$	\$100M	\$30M
bad state	$p = 2/3$	\$25M	-\$50M

This investment will not happen:

expected profit: $1/3 * (100 - 70) + 2/3 * (25 - 70) = -20$

The Algebra of Moral Hazard: Example

Government bailout guarantees change the result. Suppose the investor can borrow the entire $70 million because lenders believe that the government will protect them if his project fails and he cannot repay.

state	probability	loan repayment
good state	$p = 1/3$	$70 million
bad state	$p = 2/3$	$25 million

Expected profit is

$$1/3 * (100 - 70) + 2/3 * (25 - 25) = 10$$
$$1/3 * 30 + 2/3 * 0 = 10$$

Deregulation and Crisis

Starting in the 1980s, many countries deregulated domestic banking.
They faced serious problems a decade later.

- ▶ US
- ▶ Japan
- ▶ Scandinavian countries
- ▶ United Kingdom
- ▶ Switzerland

Moral Hazard: Example

1980s U.S. savings and loan industry:

- ► government guarantees on deposits
- ► no close regulation of risk taking.
- ► eventual bill to U.S. taxpayers: $124 billion.
- ► not fully resolved until mid-1990s

Similar mishandling of the financial sector led to much larger bank losses in the 1990s in industrial countries as diverse as Sweden and Japan.

Reform legislation led to a decade of relative financial calm.

Note
See https://www.federalreservehistory.org/essays/savings-and-loan-crisis

World Banking Crises

Frequency of Systemic Banking Crises by Country Income Level, 1976–2017

Generalized banking crises have been plentiful around the world since the mid-1970s, mainly in poorer countries, but starting in 2008, a substantial number of richer countries were also hit hard.

Source: Reproduced from Laeven and Valencia, *op. cit.* Thanks to Luc Laeven for supplying these data.

Regulation of International Banking

Banks fail because they do not have enough or the right kind of assets to pay for their liabilities.

▶ The principal liability for commercial banks and other depository institutions is the value of deposits, and banks fail when they can not pay their depositors.

▶ If the value of assets decline, say because many loans go into default, then liabilities could become greater than the value of assets and bankruptcy could result.

▶ In many countries there are several types of regulations to avoid bank failure or its effects.

Reserve Requirements

Banks are historically required to hold some deposits on reserve

- as vault cash in case of a need for cash, or
- at the central bank

Decline of reserve requirements:

- Canada: no reserve requirements since 1994
- US: no reserve reserve since 2020

Move to interest on reserves:

- US: Federal Reserve Board's Regulation D
- http://www.federalreserve.gov/monetarypolicy/reservereq.htm
- Since Oct 2008, Fed pays interest on reserves

Reserve Requirements (cont)

The Financial Services Regulatory Relief Act of 2006

- authorized the Federal Reserve Banks to pay interest on balances held at Reserve Banks
- Fed started paying interest in 2008
- current rate: https://www.federalreserve.gov/monetarypolicy/reserve-balances.htm

Reserve requirements set by Federal Reserve to 0% in 2020

https://www.federalreserve.gov/monetarypolicy/reservereq.htm

Regulation of International Banking: Capital Requirements

Capital requirements and asset restrictions:

- ▶ Higher bank capital (net worth) allows banks to have more funds available to cover the cost of failed assets
- ▶ By preventing a bank from holding (too many) risky assets, asset restrictions reduce risky investments
- ▶ By preventing a bank from holding too much of one asset, asset restrictions also encourage diversification

Regulation of International Banking (cont.)

Bank examination Regular examination prevents banks from engaging in risky activities

Lender of last resort:

- ▶ In the U.S., the Federal Reserve System may lend to banks with inadequate reserves (cash)
- ▶ Prevents bank panics
- ▶ Acts as insurance for depositors and banks, in addition to deposit insurance
- ▶ Creates a moral hazard for banks to take more risk because they are no longer fully responsible for the risk

Government restructuring and bailouts:

- ▶ arrange purchase of insolvement bank by healthier bank
    - ▶ SVB bought by First Citizens in 2023
    - ▶ Credit Suisse bought by USB in 2023

Difficulties in Regulating International Banking

1. Deposit insurance in the U.S. covers losses up to $250,000, but since the size of deposits in international banking is often much larger, the amount of insurance is often minimal.

2. Reserve requirements could act as a form of insurance for depositors, but countries can not impose reserve requirements on foreign currency deposits in agency offices, foreign branches, or subsidiary banks of domestic banks.

3. Bank examination, capital requirements and asset restrictions are more difficult internationally.
   - Distance and language barriers make monitoring difficult.
   - Different assets with different characteristics (ex., risk) exist in different countries, making judgment difficult.
   - Jurisdiction is not clear in the case of subsidiary banks: if a subsidiary of an Italian bank located in London that primarily has offshore U.S. dollar deposits, which regulators have jurisdiction?

4. No international lender of last resort for banks exists.
   - ▶ The IMF sometimes acts a "lender of last resort" for governments with balance of payments problems.
5. The activities of non-bank financial institutions are growing in international banking, but they lack the regulation and supervision that banks have.
6. Derivatives and securitized assets make it harder to assess financial stability and risk because these assets are not accounted for on the traditional balance sheet.
   - ▶ A securitized asset is a combination of different illiquid assets like loans that is sold as a security.

International Regulatory Cooperation

Basel accords (1988, 2004, 2010) provide standard regulations and accounting for international financial institutions.

- ▶ Basel I (1988) tried to make bank capital measurements standard across countries.
- ▶ Core principles of effective banking supervision was developed by the Basel Committee in 1997 for countries without adequate banking regulations and accounting standards.
- ▶ Basel II (2004) developed *risk-based capital requirements*, where more risky assets require a higher amount of bank capital.
- ▶ Basel III (2010–2023) increased capital and liquidity requirements.

Ironically, although most developed countries implemented Basel II by 2008, that was just in time for the GFC.

Summary

1. Gains from trade of goods and services for other goods and services are described by the theory of comparative advantage.
2. Gains from trade of goods and services for assets are described by the theory of intertemporal trade.
3. Gains from trade of assets for assets are described by the theory of portfolio diversification.
4. Policy makers can only choose 2 of the following: a fixed exchange rate, a monetary policy for domestic goals, free international flows of assets.

Summary (cont.)

5. Several types of offshore banks deal in offshore currency trading, which developed as international trade has grown and as banks tried to avoid domestic regulations.

6. Domestic banks are regulated by deposit insurance, reserve requirements, capital requirements, restrictions on assets, and bank examinations. The central bank also acts as a lender of last resort.

7. International banking is generally not regulated in the same manner as domestic banking, and there is no international lender of last resort.

Summary (cont.)

8. As international capital markets have developed, diversification of assets across countries has grown and differences between interests rates on offshore currency deposits and domestic currency deposits within a country has shrunk.

9. If foreign and domestic assets are perfect substitutes, then interest rates in international capital markets do not predict exchange rate changes well.

10. Even economic variables do not predict exchange rate changes well in the short run.

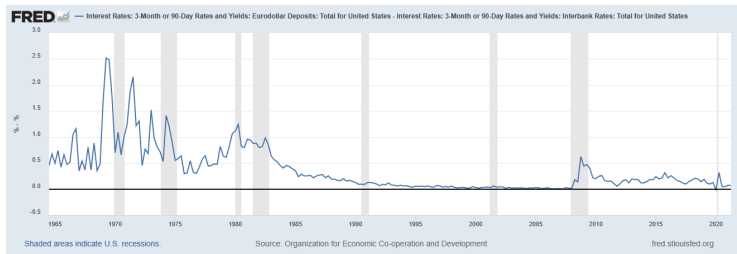Appendix: Information Transmission and Financial Capital Mobility

Extent of Information Transmission and Financial Capital Mobility

We should expect that interest rates on offshore currency deposits and those on domestic currency deposits within a country should be the same if

- the two types of deposits are treated as perfect substitutes,
- assets can flow freely across borders and
- international capital markets are able to quickly and easily transmit information about any differences in rates.

And in fact, differences in interest rates have approached zero as financial capital mobility has grown and information processing has become faster and cheaper through computers and telecommunications.

Dollar Interest Differential: London vs US

Offshore vs onshore rates: Since the generalized float, comparable
offshore and onshore rates tend to be aligned except in times of
crisis. (Here: London 3 mo. Eurodollar less US 3 mo. interbank)

Source: https://fred.stlouisfed.org/graph/
fredgraph.png?g=1kGv0

Compare: KOMIE Fig 20-4

Recall that if assets are treated as perfect substitutes, then we expect interest parity to hold on average:

$$R - R^* = (E^e - E)/E$$

Under this condition, the interest rate difference is the market's forecast of expected changes in the exchange rate.

▶ If we replace expected exchange rates with actual future exchange rates, we can test how well the market predicts exchange rate changes.

▶ But interest rate differentials fail to predict large swings in actual exchange rates and even fail to predict which direction actual exchange rates change.

Extent of Information Transmission and Financial Capital Mobility (cont.)

Given that there are few restrictions on financial capital in most major countries, does this mean that international capital markets are unable to process and transmit information about interest rates?
Not necessarily: if assets are imperfect substitutes then

$$R - R^* = (E^e - E)/E + \rho$$

► Interest rate differentials are associated with exchange rate changes and with risk premiums that change over time.

► Changes in risk premiums may drive changes in exchange rates rather than interest rate differentials.

Extent of Information Transmission and Financial Capital Mobility (cont.)

$$R - R^* = (E^e - E)/E + \rho$$

Since both expected changes in exchange rates and risk premiums are functions of expectations and since expectations are unobservable,

▶ it is difficult to test if international capital markets are able to process and transmit information about interest rates.

Exchange Rate Predictability

In fact, it is hard to predict exchange rate changes over short horizons based on money supply growth, government spending growth, GDP growth and other "fundamental" economic variables.

► The best prediction for tomorrow's exchange rate appears to be today's exchange rate, regardless of economic variables.

► But over long time horizons (more than 1 year) economic variables do better at predicting actual exchange rates.

Appendix:
Generalizing State Dependent Outcomes

(This is just FYI; you are not responsible for this appendix.)

Generalizing State Dependent Outcomes

Domestic investors invest wealth (W) at home or abroad.
Hold wealth in a Home asset (H) or a Foreign asset (F).
The future is random, with two possible future states.

▶ State 1 occurs with probability q.

▶ State 2 therefore occurs with probability $1 - q$.

State 1: a unit of wealth invested in H pays H_1 units of output, but a unit of wealth invested in F pays F_1 units of output.

State 2: a unit of wealth invested in H pays H_2 units of output, but a unit of wealth invested in F pays F_2 units of output.

Analyzing State Dependent Outcomes

Let α be the proportion the investor allocates to H.

The rest $(1 - \alpha)$ is invested in F.

If state 1 occurs, for each unit of wealth, the investor will be able to consume
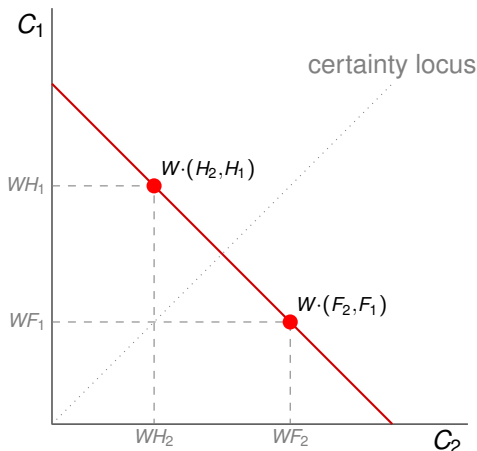
$$C_1/W = \alpha H_1 + (1 - \alpha)F_1$$

If state 2 occurs, the investor will be able to consume

$$C_2/W = \alpha H_2 + (1 - \alpha)F_2$$
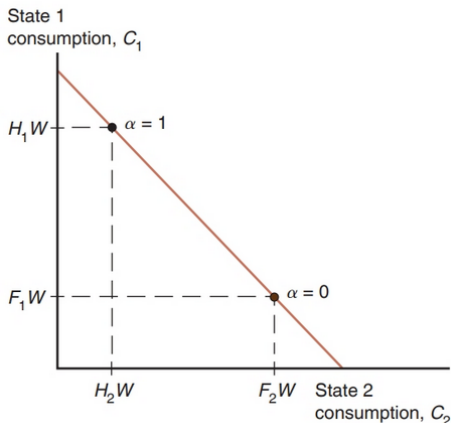
Consumption Possibilities

Assume: $H_1 > F_1$ but $H_2 < F_2$.

Let α be the proportion in the home asset. So $1 - \alpha$ is the proportion in the foreign asset.

Consider the cases where $\alpha = 1$ or $\alpha = 0$. (No diversification.) These are only two of many posibilities.

Maximizing Expected Utility

Utility depends on consumption. A domestic investor derives utility $U[C]$ from consumption. Let marginal utility be positive but decreasing in consumption.

The investor does not know beforehand which state will occur.

Decision Rule: maximize the expected (i.e., average) utility from future consumption,
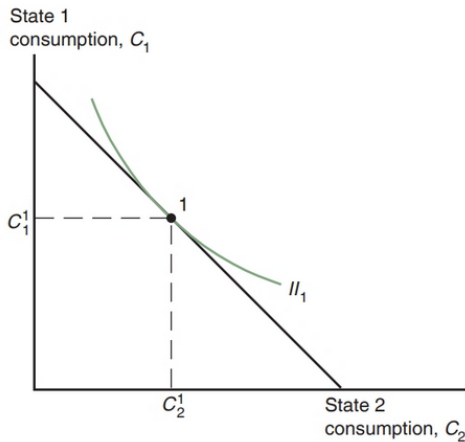
$$q\, U[C_1] + (1-q)\, U[C_2]$$

Portfolios and Utility
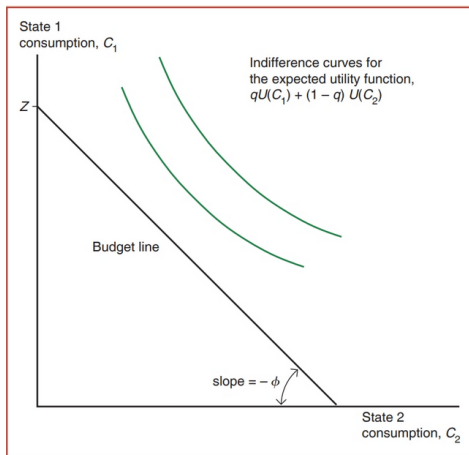
$$\phi = -\frac{H_1 - F_1}{H_2 - F_2}$$

Portfolios and Utility (cont)

Effect of a Rise in H1

Illustrated case: substitution effect stronger than income effect, so C_2 falls.