



**University of Leipzig**  
**Faculty of Economics and Business Administration**  
**Institute for Economic Policy**

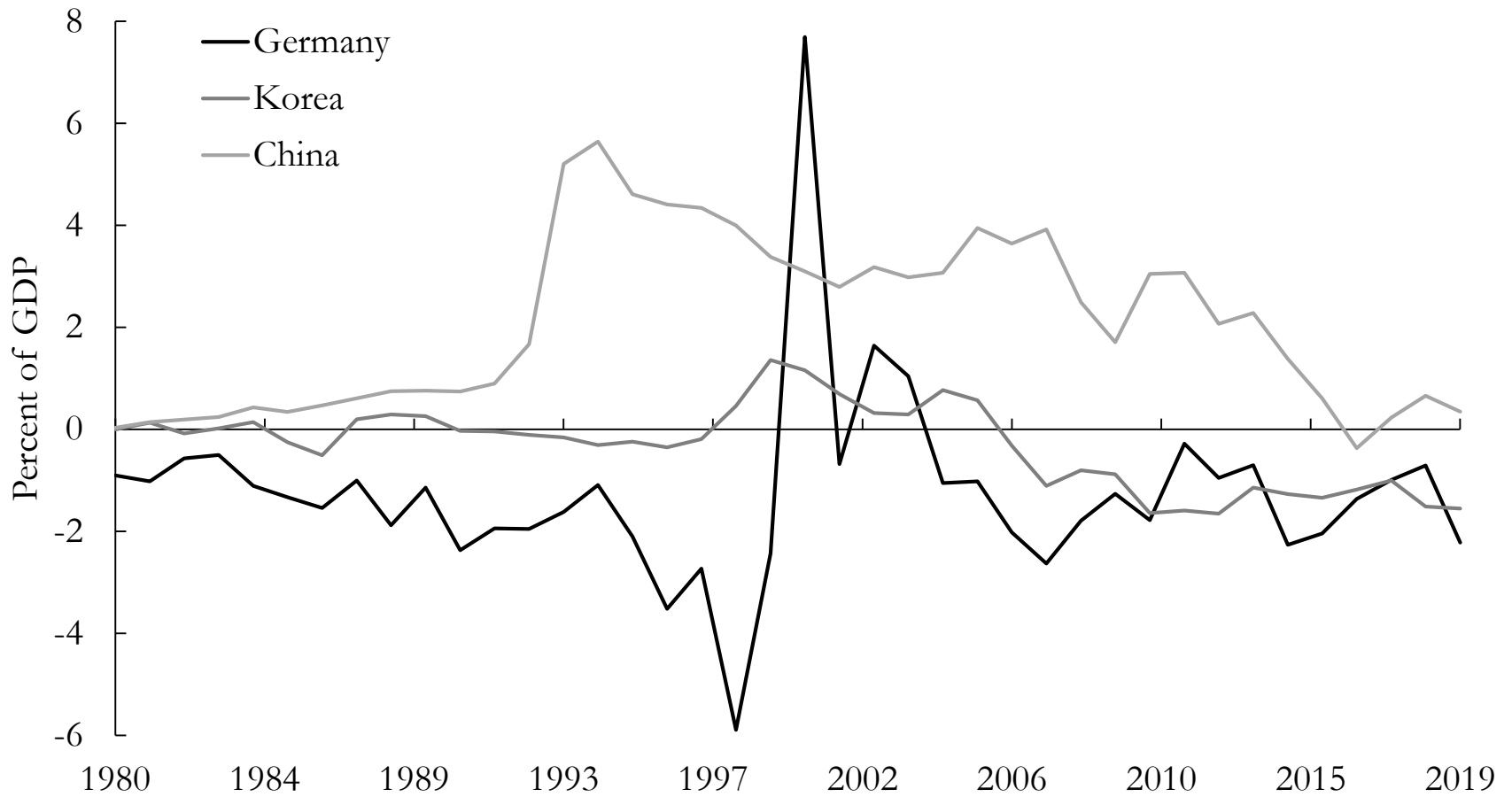
International Trade

Prof. Dr. Gunther Schnabl

VI. International Factor Movement: Labor and Capital



# Net FDI in China, Korea and Germany



Source: WDI 2021.



# VI. International Factor Movement: Labor and Capital

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# 1. Forms of International Integration

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## Forms of International Integration

- International exchange of goods and services,
- international movements of factors of production
  - labor: migration,
  - capital: international lending, foreign direct investment.

## Labor Abundant Countries

- Import capital intensive goods or
- acquire capital by borrowing abroad.

## Capital Abundant Countries

- Import labor intensive products or
- employ migrant workers.

The alternatives may have similar economic consequences, but are different in their political acceptability.



## 2. International Labor Mobility

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### What are the determinants and effects of labor mobility?

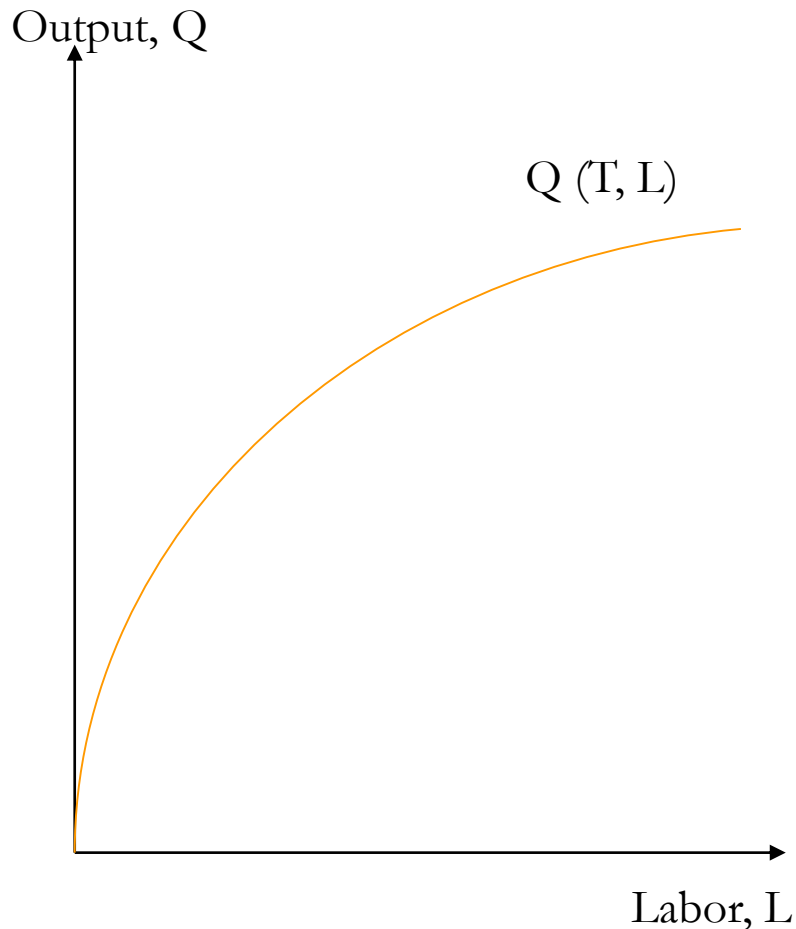
- We start with a world without labor integration
- and examine what happens when migration takes place.

### Assumptions

- Two countries, two factors of production (land  $T$  and labor  $L$ ), only one good produced.
- Integration takes place via international movement of labor.
- The output ( $Q$ ) depends on the quantities of land ( $T$ ) and labor ( $L$ ) which are available:  $Q = f(T, L)$ .
- The supply of land is fixed and is not mobile across borders.
- Home and Foreign have the same production technology but different overall land-labor ratios.
- Home is relatively labor abundant, Foreign is relatively land abundant.
- There is perfect competition.



## Without International Labor Movement

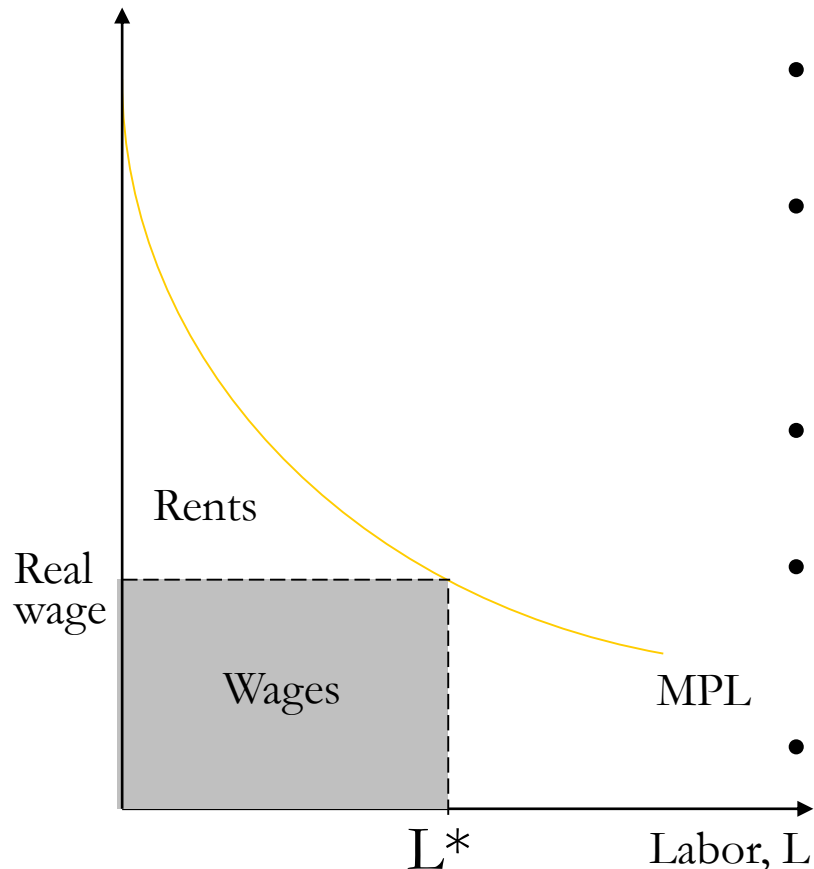


- The diagram illustrates an economy's production function  $Q = f(T, L)$  without labor market integration.
- The larger the supply of labor the larger is the output. The supply of land is fixed.
- The slope of the curve  $Q$  indicates a decreasing marginal product of labor.
- As a country employs more labor on a given amount of land the additional output per additionally employed unit of labor decreases.



# The Marginal Product of Labor in Autarky

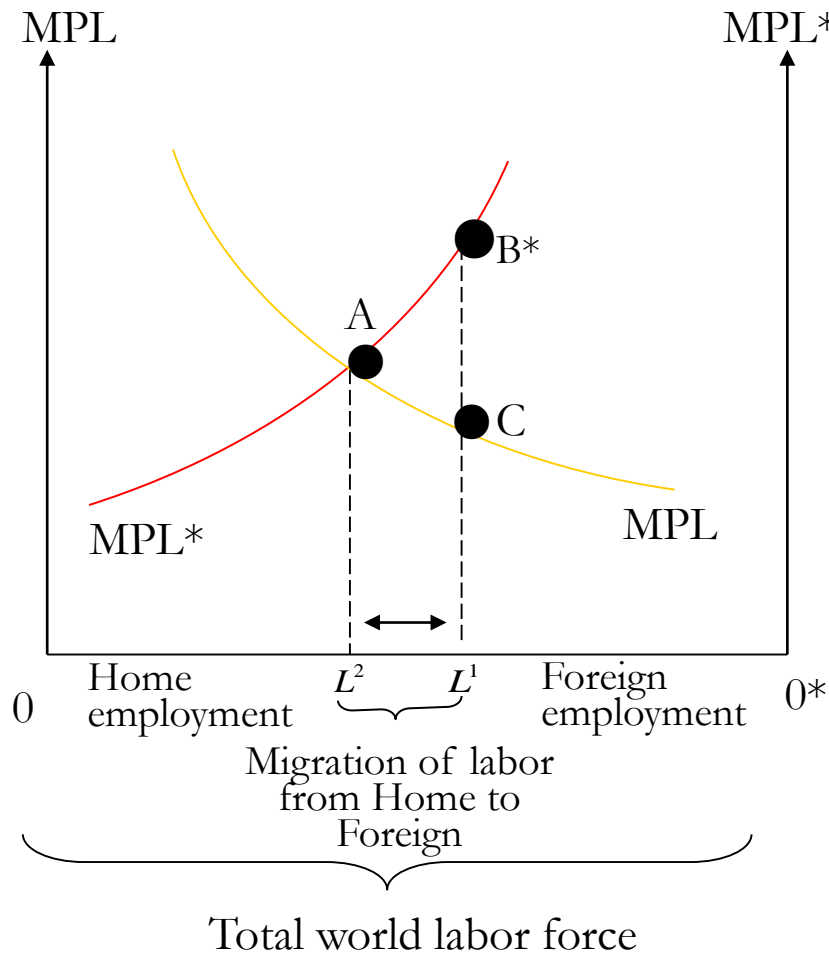
Marginal product  
of labor, MPL



- The MPL curve illustrates the slope of the production function  $Q$  ( $MPL=Q'$ ).
- The larger the employment, the smaller is the marginal product of labor (MPL).
- The area under the MPL curve is equal to the output. Every extra employee increases the total output to a smaller degree than the ones before did.
- Given a specific amount of labor, for instance  $L^*$ , the marginal product determines the real wage.
- The labor income is indicated by the square below the real wage. The land owners income (rents) are shown by the area above.
- If the wage increases, a higher proportion of income is spent on wages and a smaller on rents.



# International Labor Mobility



- The horizontal axis represents the world labor supply. In autarky  $0L^1$  ( $0^*L^1$ ) is the Home (Foreign) employment.
- The left (right) vertical axis shows the marginal product of labor in Home (Foreign).
- Because Home is relatively labor abundant, in autarky, workers will earn less than those in Foreign.
- Point C illustrates the real wages in Home and point  $B^*$  in Foreign.
- If migration is allowed, parts of Home's labor will migrate to Foreign. Home's (Foreign's) employment becomes  $0L^2$  ( $0^*L^2$ ).





## International Labor Mobility (cont.)

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- The **world real wage converges** at point  $A$  where the marginal product of labor is the same in both countries.
- The **world output increases as a whole**. Foreign's output rises by the area under the marginal product curve from  $L^1$  to  $L^2$ , while Home's output falls respectively.
- Foreign's output gain is larger than Home's loss.
- The overall gain is illustrated by the area  $AB^*C$ .
- Despite this gain **there will be winners and losers**.
  - Workers in Home gain (rising real wages).
  - Workers in Foreign lose (falling real wages).
  - Migrant workers from Home to Foreign gain (rising real wages).
  - Land owners in Home lose (shrinking rents).
  - Land owners in Foreign gain (rising rents).
- The model shows that labor mobility is – as trade – driven by international differences in resource endowment.



## Extending the Model by Trade

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- **The Heckscher-Ohlin model** assumes **two goods** with different labor intensities. Trade leads to complete equalization of factor prices. World production increases without factor mobility.
- Trade is a perfect substitute for labor mobility.
- Home can export labor and import land by exporting the labor intensive product and importing the land intensive product.
- **There is no incentive for labor movements**, once factor prices are equalized.
- In practice, complete factor price equalization is unlikely because competition is not perfect due to transaction costs, formal trade barriers, differences in technology, etc.
- Similarly, barriers to factor movements do not remove the incentives to trade as long as free trade persists.
- The message of the Heckscher-Ohlin model, i.e. factor price equalization, is not changed by the assumption of international labor mobility.



## Wage Convergence in the Age of Mass Migration

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- In the late 19th and early 20th century there were several waves of mass migration.
- Immigration was a major source of population growth in some countries. Fast population growth in other countries caused a fast increase in emigration.
- Millions of people moved long distances.
- In particular, people from Scandinavia, Ireland, Italy and Eastern Europe moved to places where land was abundant and wages were high: the United States, Canada, Argentina, Australia and New Zealand.
- Chinese moved to Southeast Asia and the United States, Japanese moved to Brazil, and Indians moved to Africa and the Caribbean.
- Mass migration in those days was facilitated by low level of legal restrictions on migration and a dramatic improvement in transportation technologies, such as steamships and railroads.
- As the labor mobility model predicts, this process caused real wage convergence.



# Empirical Evidence

	Real Wage, 1870 (US = 100)	Percentage Increase in Real Wage, 1870-1913
<i>Destination countries</i>		
Argentina	53	51
Australia	110	1
Canada	86	121
United States	100	47
<i>Origin Countries</i>		
Ireland	43	84
Italy	23	112
Norway	24	193
Sweden	24	250

Source: Williamson 1995



## 3. International Borrowing and Lending

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### Types of Private Financial Transactions

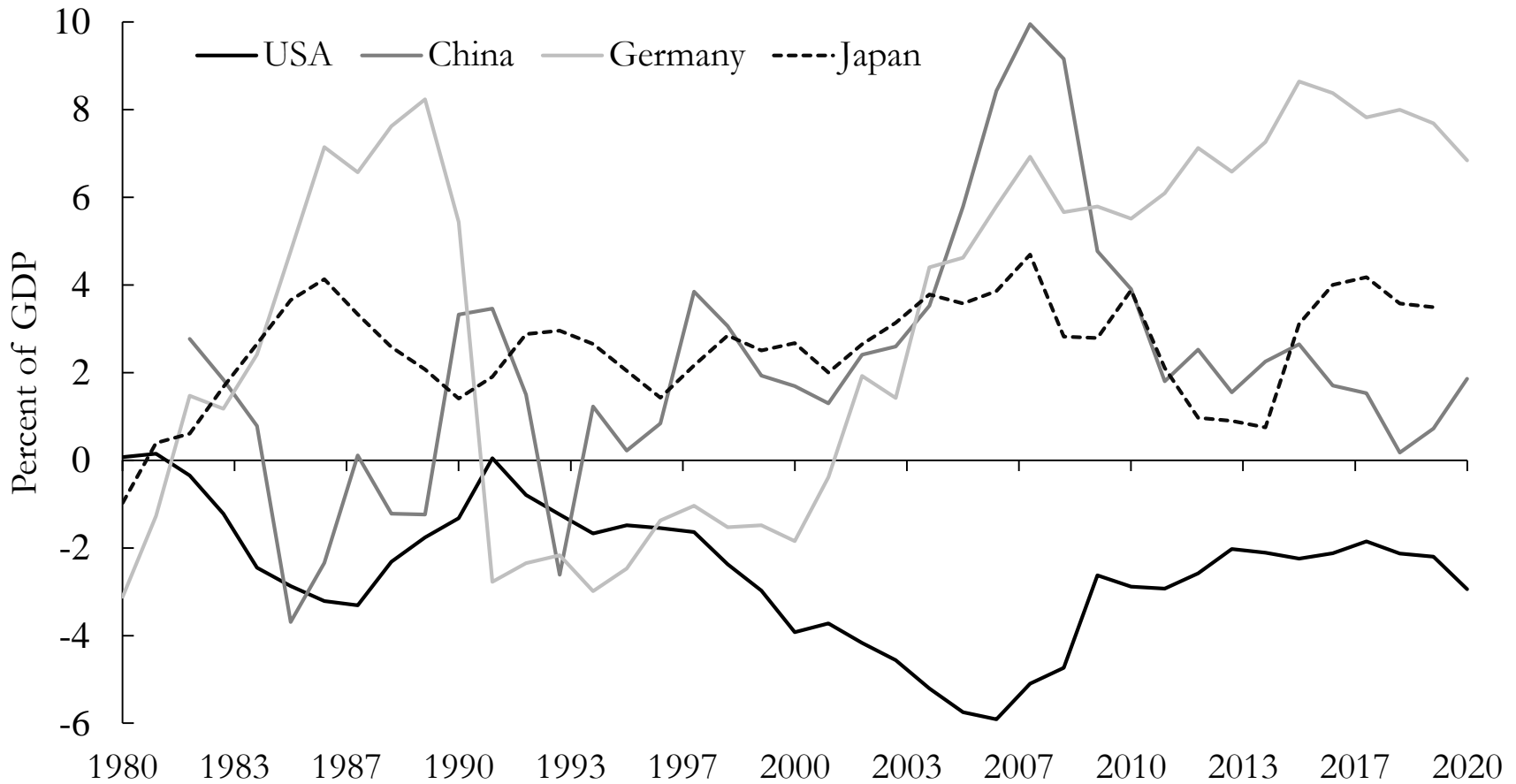
- A German bank lends to a US firm (bank lending).
- A French resident buys stocks in Italy (portfolio investment).
- A Japanese firm invests through its Chinese subsidiary (FDI).

### Lending as Inter-temporal Trade

- International borrowing and lending can be interpreted as international trade. Trade is not seen as exchanging one good for another at one point in time. But goods today are traded for goods in future (**inter-temporal trade**).
- Open economies can save by domestic investment and current account surpluses (capital account deficits):  $S = I + CA$
- The more investment an economy undertakes and the more capital it exports, the higher future consumption will be.



# Current Account: Japan, China, US, Germany

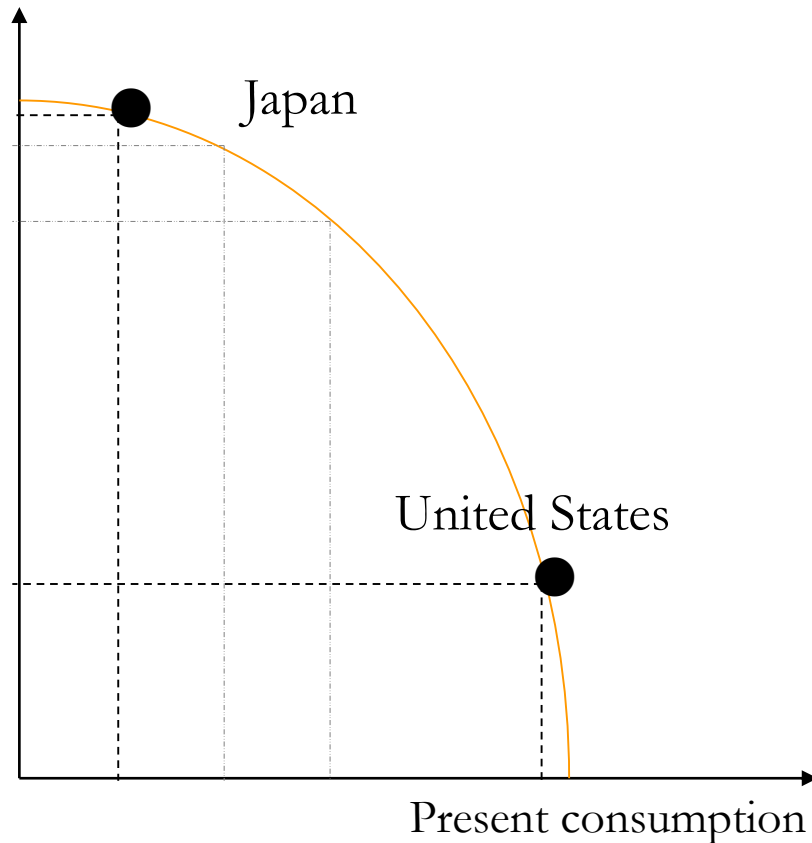


Source: IMF 2021 and Worldbank 2021.



# The Inter-Temporal Production Possibility Frontier

Future consumption



- The inter-temporal production possibility frontier illustrates the trade-off between present and future consumption.
- The slope of the possibility frontier indicates increasing opportunity costs in terms of future consumption.
- The inter-temporal production possibilities differ among countries, for instance between US and Japan.



# The Real Interest Rate

	Home (US)	Foreign (Japan)*
<b>Assumptions on consumption preferences</b>	present consumption preferred	future consumption preferred
<i>Autarky</i>		
<b>Real interest rate</b>	high	low
<b>Return on investment</b>	high	low
<i>International Factor Mobility</i>		
<b>Capital movements</b>	net capital imports	net capital exports
<b>Repayment in future</b>	$(1+r)$ times the quantity borrowed	$(1+r)$ times the quantity lent
<b>Relative price of one unit present (future)* consumption</b>	$(1+r)/1$ units in future	$1/(1+r)$ units in present





## 4 Foreign Direct Investment and Multinational Firms

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- While short-term capital flows tend to follow short-term interest rates, for Foreign Direct Investments (FDI) the long-term yield of production facilities matters. FDI are international capital flows in which a firm creates or expands a subsidiary in another country.
- FDI's main purpose is the acquisition of control in foreign production rather than a simple financial transaction.

### **Multinational Firms in Practice**

- Worldwide there are more than 100,000 multinational firms with more than 900,000 subsidiaries which employ more than 85 million employees (2018).
- A substantial part of total world exports is internal trade of multinational organizations.
- The employment of foreign-owned firms rose strongly in the manufacturing sector since the 1950s.



# The Theory of Multinational Enterprises

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## Why do Firms Produce in Several Countries?

- The **theory of location** is based on classical trade theory. It quotes that the location of production is determined by resources.
- Reducing transportation costs, barriers to trade and being closer to the sales market (consumer preferences) are further reasons for producing in foreign countries (China).

## Why is Production in Several Places Done by the Same Firm Rather than by Separate Firms?

- The **theory of internalization** states that there are important transactions of intermediate goods, technology etc. between the subsidiaries of multinational firms in different countries.
  - It is more profitable to carry out these transactions within one firm rather than between firms because of internal advantages: For instance, external technology transfer is restricted because of intellectual property rights restrictions.
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## The Eclectic Theory of FDI

The Eclectic Theory of FDI by Dunning (1979) known as OLI-Paradigm represents a mix of three different FDI theories:

<b>Ownership advantages</b>	... address the “why go abroad?” - question which suggests that the MNE has “firm specific advantages” (e.g. core competency) which allows it to overcome the costs of operating in a foreign country.
<b>Location advantages</b>	... focus on the “locate where?” - question. The motive to move offshore is to use the firm’s competitive advantage in conjunction with factor advantages in a foreign country. Through these factors (e.g. labor, land) the MNE makes profits (earns rents) on its firm specific advantages.
<b>Internalization advantages</b>	... refers to the “how go abroad?” - question. The MNE has various choices of market entry modes. These range from co-operations with firms in the foreign market (arm’s length transactions) to investments in the foreign market (wholly owned subsidiary). If the market functions poorly, transaction costs can be kept low through internalization.



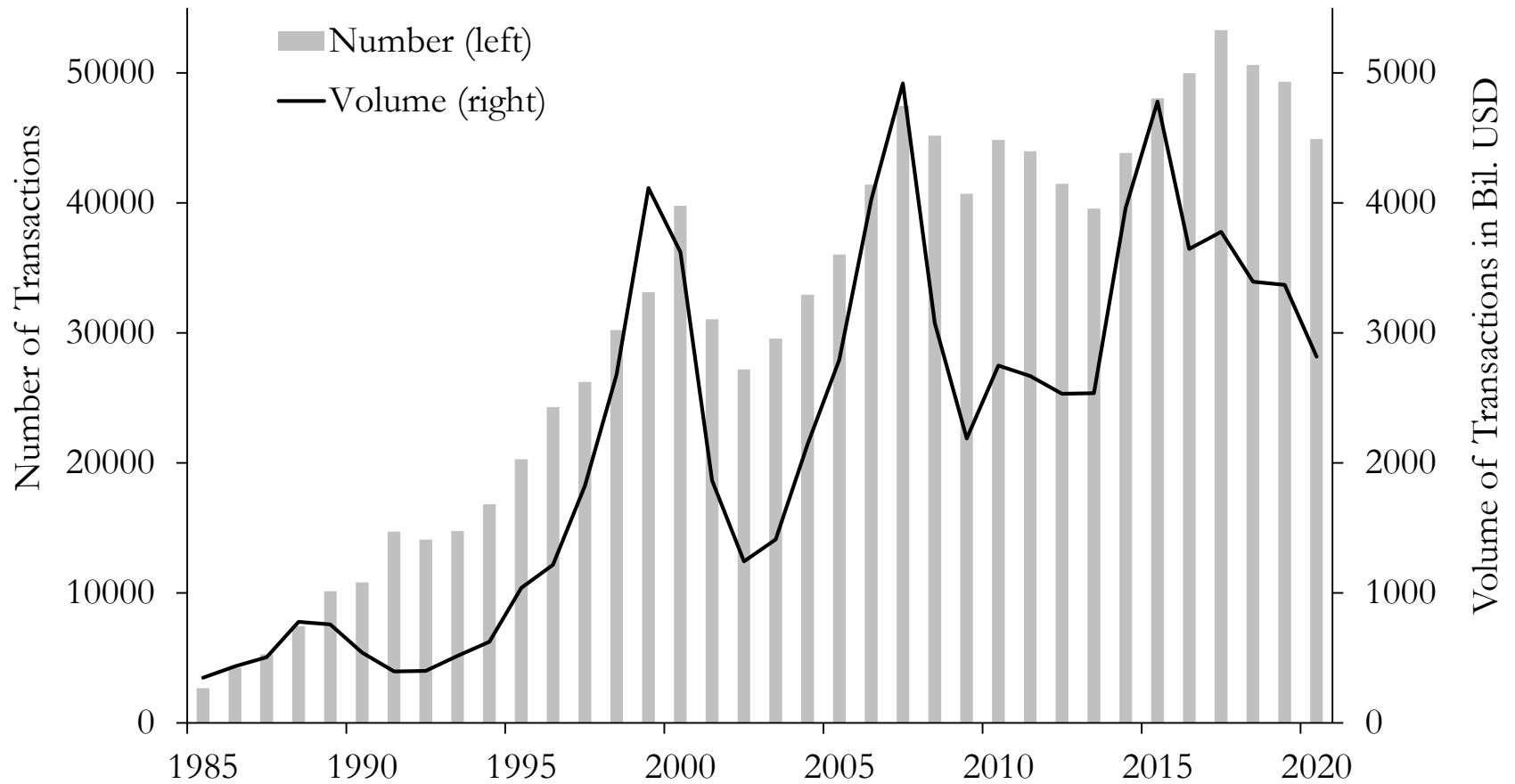
# Estimation of Determinants of FDI

Dependent Variable	(1) Ln(1 + FDI)
Estimation Method	OLS
GDP sum	1.023 (0.034)**
GDP per capita	-0.422 (0.120)**
Absolute difference	
Common language	1.6379 (0.246)**
Adjacency	-0.190 (0.259)
Colonial links	1.2825 (0.501)*
Common legal origin	0.5358 (0.170)**
Regional trade agreement	0.010 (0.199)
Capital tax agreement	0.520 (0.187)**
Bilateral investment agreement	1.843 (0.882)*
Distance	-0.957 (0.077)**
Time zone difference	-
Observations	867
Censored observations	-
R-squared	0.67

Source: Stein/Daude 2007



# Mergers and Acquisitions (World)



Data: Institute for Mergers, Acquisitions and Alliances (IMAA) 2021.



## 5. Summary

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- International factor movement can substitute or create trade.
- International migration of labor is similar in its causes to international trade: differences in factor endowment and relative prices.
- International factor movement raises total world output.
- It can generate income distribution effects.
- International borrowing and lending can be viewed as trade of present consumption for future consumption.
- Multinational firms often serve as vehicles for international borrowing and lending but they primarily exist as ways of extending control over activities taking place in two or more different countries.
- The existence of multinational firms can be (inter alia) explained by location and internalization.
- Monetary policies have become an important determinant of international capital flows.



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