

ECO 209Y

MACROECONOMIC THEORY AND POLICY

LECTURE 7:

INTRODUCTION TO THE OPEN ECONOMY

THE BALANCE OF PAYMENTS

- On the one hand, the home country will **export** goods and services to other countries and, at the same time, it will **import** goods and services from other countries
- On the other hand, residents of the home country will **invest** in foreign countries and foreigners will **invest** in the home country
- The **balance of payments** is the record of all these transactions of the residents of a country with the rest of the world
- There are two main accounts in the balance of payments: the **current account** and the **capital account**

CURRENT ACCOUNT

- The **current account** records trade in goods and services, income from assets, and transfer payments
 - Tourism and education, for instance, are **services**
 - Sherritt's profits in Cuba represent **income from assets**
 - Gifts and grants, for instance, are **transfer payments**
- The **current account balance (CuAB)** is equal to exports (**X**) less imports (**Q**), plus net income from assets (**NYA**), less net transfers to foreigners (**NTR_F**):

$$\text{CuAB} = X - Q + \text{NYA} - \text{NTR}_F$$

- For simplicity, we will assume that **NYA = NTR_F = 0** and thus:

$$\text{CuAB} = \text{NX} = X - Q$$

CAPITAL ACCOUNT

- The **capital account** records borrowing and lending and the purchases and sales of assets
 - Stocks, bonds, and land, for instance, are assets
- The capital account, therefore, records the flow of capital between the home country and the rest of the world
- The capital account balance (**CaAB**) is equal to the net capital flow (**CF**)

$$\text{CaAB} = \text{CF}$$

- Net capital flow could be positive (net capital **inflow**) or negative (net capital **outflow**)

BALANCE OF PAYMENT ACCOUNTING

- International transactions are made in *foreign currency* (mostly in **US\$**) and recorded as either *payments* or *receipts*
- Any transaction that involves an *outflow* of foreign currency (**US\$**) is recorded as a *payment*
 - For instance, imports of goods, travel abroad by Canadians, lending to foreigners, purchase of foreign stock, are all payments
- Any transaction that involves an *inflow* of foreign currency (**US\$**) is recorded as a *receipt*
 - For instance, exports of goods, travel by foreigners in Canada, borrowing from foreigners, sale of stock to foreigners, are all receipts

OVERALL BALANCE OF PAYMENTS

- The **overall balance of payments** is the sum of the current account and the capital account balances
 - A **deficit** means that Canadian residents make more payments to foreigners than they receive from foreigners
 - A **surplus** means that Canadian residents make less payments to foreigners than they receive from foreigners
- Any **surplus** or **deficit** in the balance of payments must be matched by **net official financing**
 - If there is a **deficit**, the central bank must provide the necessary foreign currency from its reserves
 - If there is a **surplus**, the central bank adds the excess foreign currency to its reserves of foreign currency

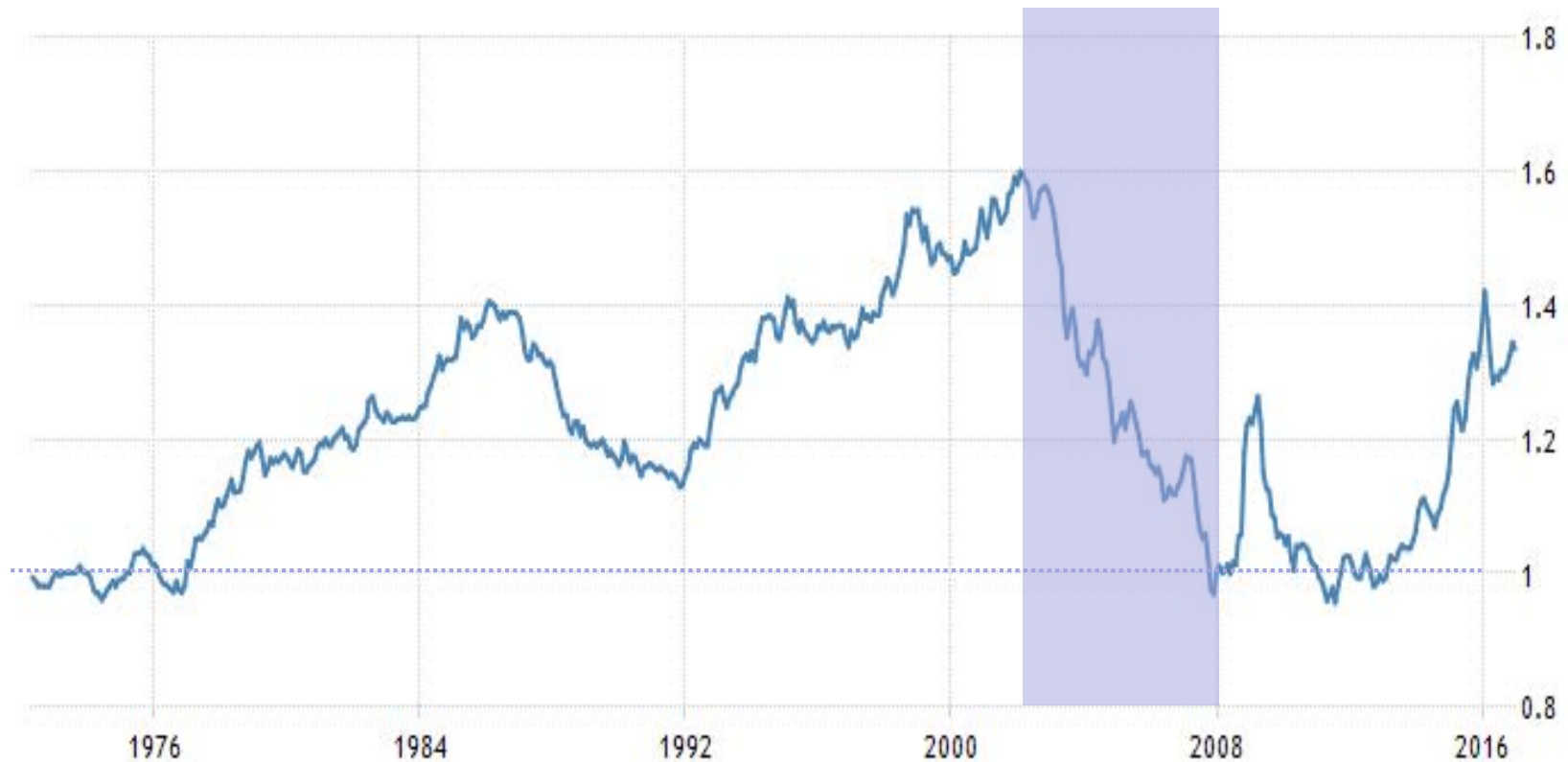
CANADA'S BALANCE OF PAYMENTS, 2010

	Receipt	Payment	Balance
Current account	547,141	598,005	-50,864
Goods and services	476,086	507,844	-31,757
Investment income	61,794	78,230	-16,436
Transfers	9,261	11,932	-2,671
Capital account	156,883	107,176	49,707
Statistical discrepancy			1,157

THE FOREIGN EXCHANGE RATE

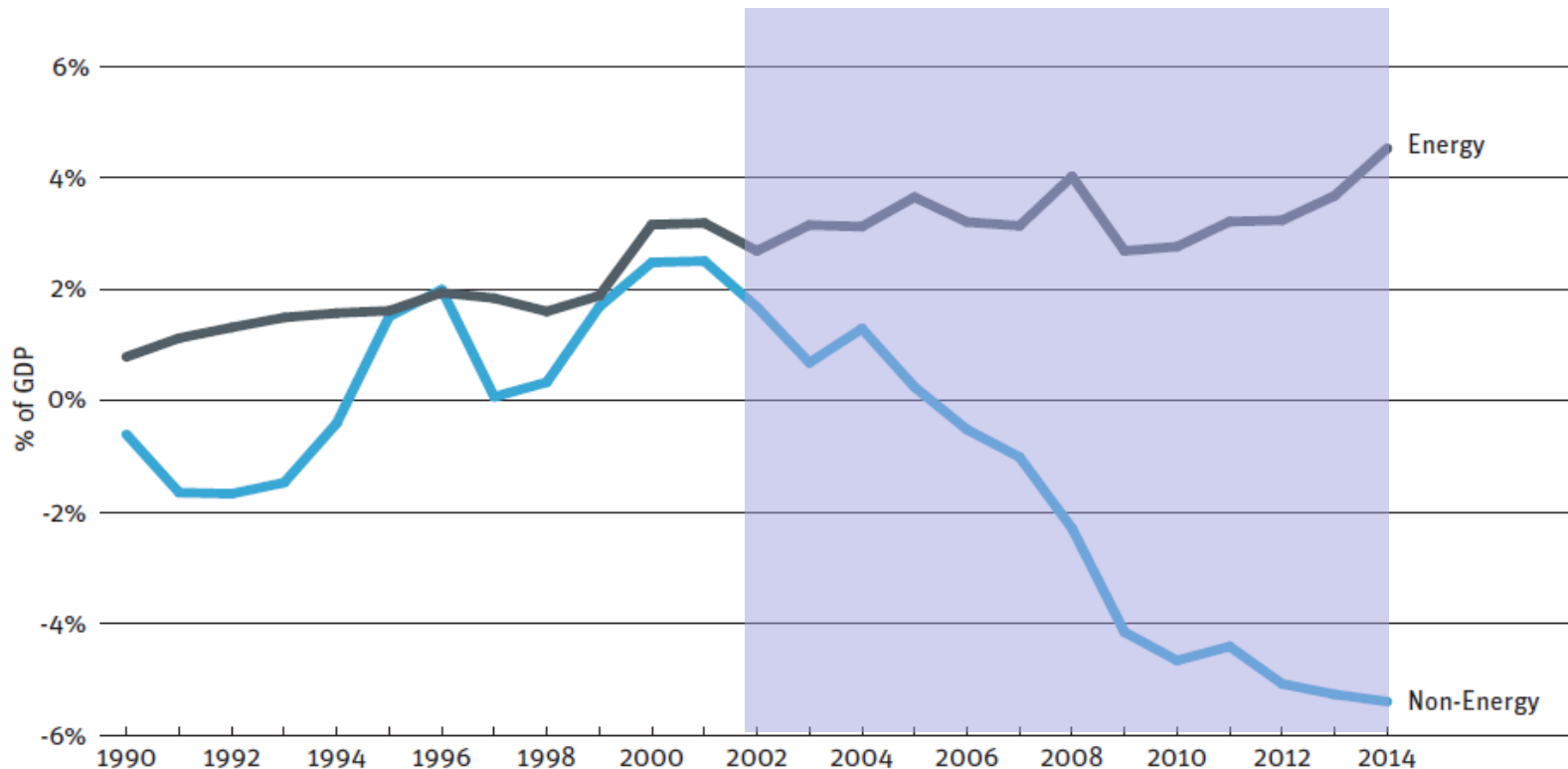
- The Bank of Canada finances the surpluses and deficits in the balance of payments
 - The type of intervention of the Bank of Canada depends on how the **exchange rate** is determined
- **Definition:** The **exchange rate** (e) is the price of 1 unit of foreign currency in terms of Canadian dollars
 - For instance, the price of 1 US dollar is about 1.31 Canadian dollars at the present time
 - Of course, the price of 1 Canadian dollar ($1/e$) is about 0.76 US dollars at the present time
- There is one exchange rate (e) for each foreign currency

THE EXCHANGE RATE BETWEEN THE CANADIAN DOLLAR AND THE U.S. DOLLAR JANUARY 1950 TO JANUARY 2017



Source: Trading Economics.

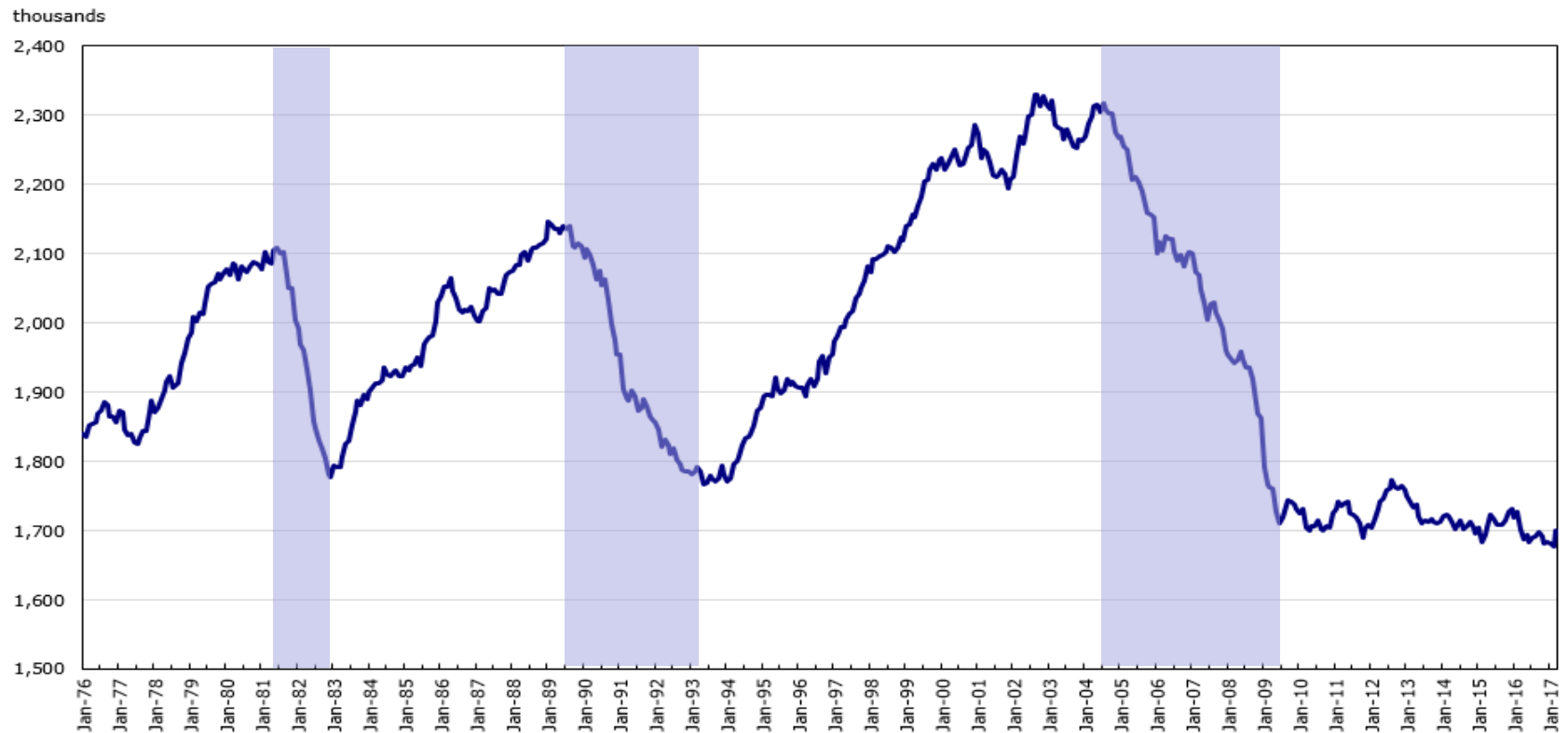
CANADA: ENERGY AND NON-ENERGY TRADE BALANCE, 1990-2014



Source: Canadian Centre for Policy Alternatives, *2016 Alternative Federal Budget*, 2016.

CANADA: CHANGES IN EMPLOYMENT IN THE MANUFACTURING SECTOR

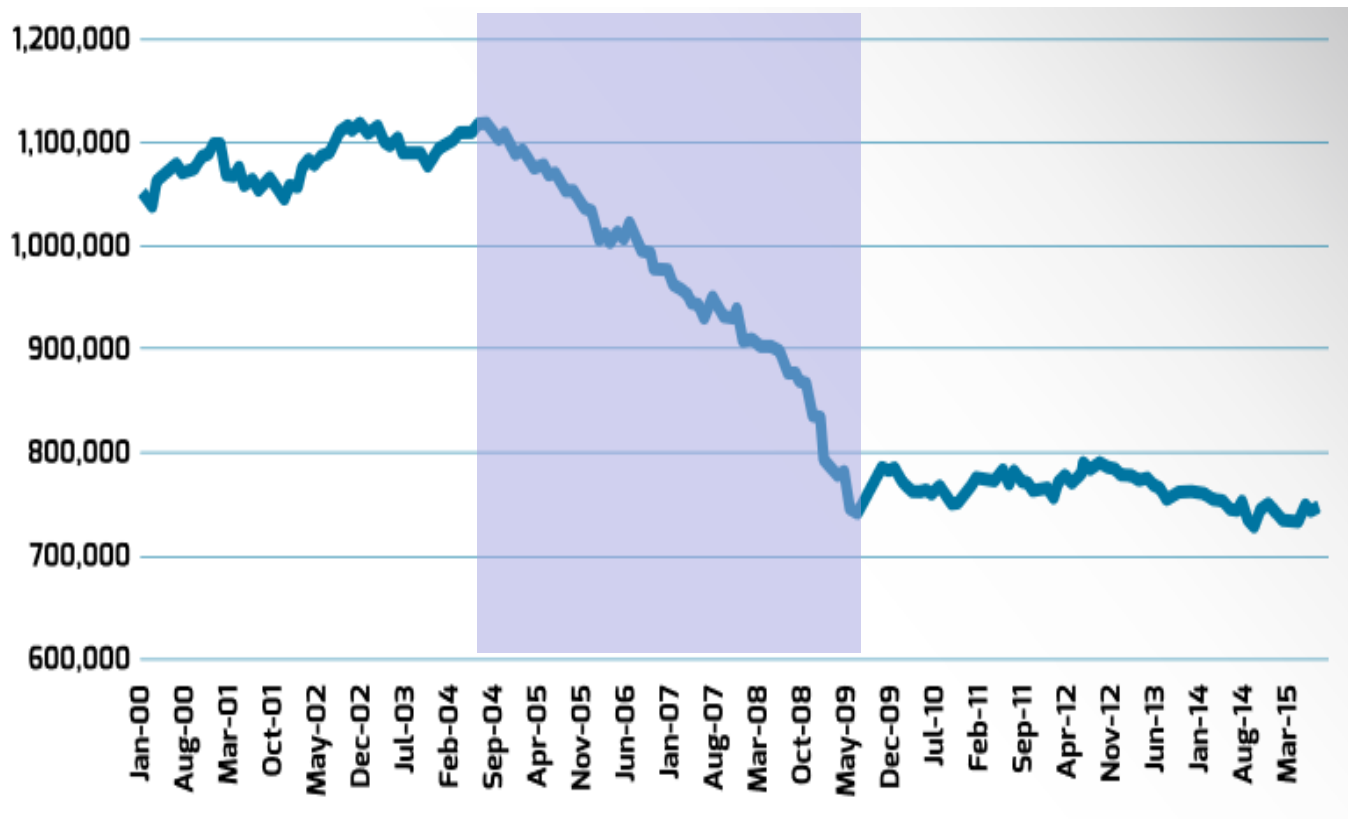
JANUARY 1976 TO JANUARY 2017



Source: Statistics Canada.

ONTARIO: CHANGES IN EMPLOYMENT IN THE MANUFACTURING SECTOR

JANUARY 2000 TO MARCH 2015



Source: Canadian Centre for Policy Alternatives with data from Statistics Canada.

FLEXIBLE VS. FIXED EXCHANGE RATE

- We'll examine two main ways of determining the value of the exchange rate (e): **1)** by the market; or **2)** by the central bank
- When e is determined by the market, the country has adopted a *flexible* (or *floating*) exchange rate system
 - The central bank allows e to be determined by supply and demand in the market for foreign currency
- Under a *fixed* exchange rate system, the central bank plays an active role in the determination of e
 - Here, the central bank sets a fixed price for foreign currency independently of market forces

FLEXIBLE EXCHANGE RATE SYSTEM

- Under a *flexible exchange rate system*, the exchange rate for the US dollar is determined by the demand and supply of US dollars in the exchange market
- The *demand* curve of US dollars in the exchange market shows the quantities demanded at each level of **e**
 - Since one currency (US\$) is exchanged for another (CDN\$), the demand for US dollars must be matched by the supply of Canadian dollars
 - Therefore, Canadian importers of US goods and services, Canadian travellers to the US, Canadian investors in the US, etc., both demand US dollars and supply Canadian dollars in the exchange market

FLEXIBLE EXCHANGE RATE SYSTEM (CONT'D)

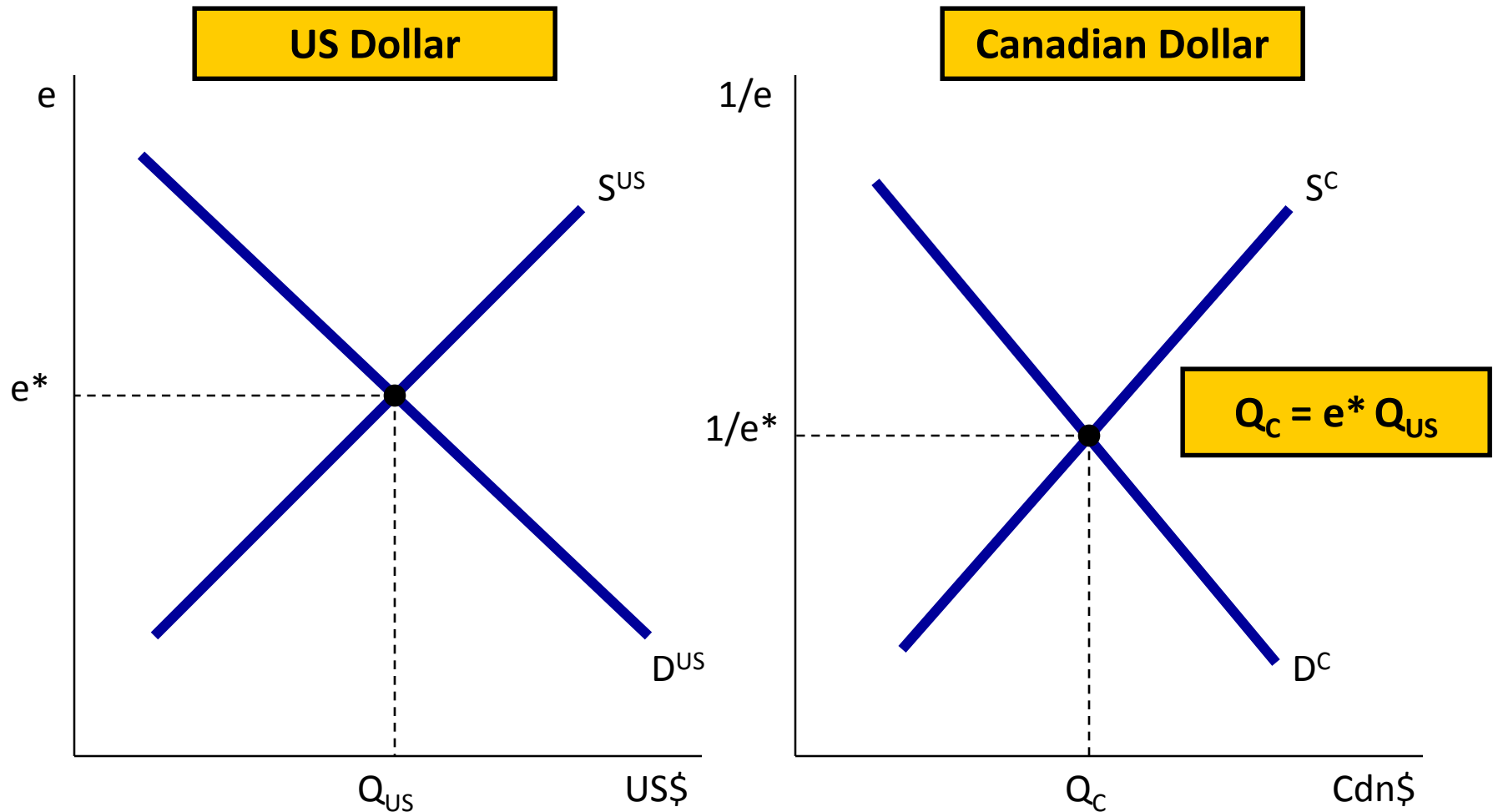
- The **supply** curve of US dollars shows the quantity supplied at each level of **e**
 - Since one currency (US\$) is exchanged for another (CDN\$), the supply of US dollars must be matched by the demand for Canadian dollars
 - Therefore, US importers of Canadian goods and services, foreign travellers in Canada, foreign investors in Canada, etc., both supply US dollars and demand Canadian dollars

FLEXIBLE EXCHANGE RATE SYSTEM (CONT'D)

- The ***equilibrium exchange rate*** for US dollars (e^*) is determined where the supply of US dollars and the demand for US dollars intersect
 - At e^* , a certain amount of US\$ (Q_{US}) is exchanged for CAD\$ in the exchange market
- In turn, the ***equilibrium value of the Canadian dollar*** measured in terms of US dollars ($1/e^*$) is determined where the supply and demand for Canadian dollars intersect
 - At $1/e^*$, a certain amount of CAD\$ (Q_C) is exchanged for US\$ in the exchange market
- Therefore, a quantity Q_{US} of US dollars is exchanged for a quantity Q_C of Canadian dollars:

$$e^* Q_{US} = Q_C$$

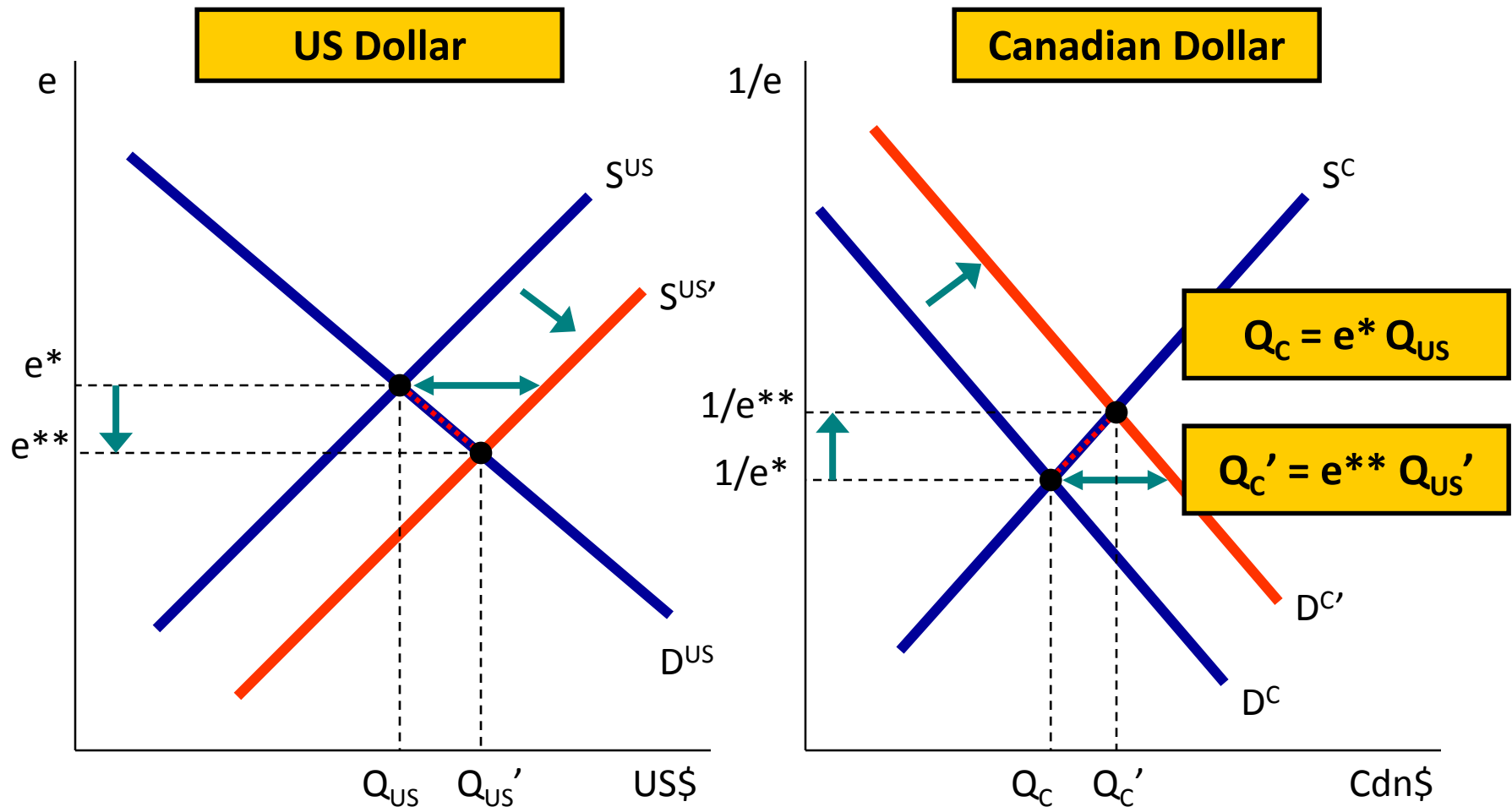
THE DETERMINATION OF A FLEXIBLE EXCHANGE RATE



A CHANGE IN THE EXCHANGE RATE

- The equilibrium value of e changes whenever there is a change in the demand for or supply of foreign currency
- An increase in demand, or a decrease in supply, increases e
 - This means that the exchange rate has *appreciated*, and thus the Canadian dollar has *depreciated*
- A decrease in demand, or an increase in supply, decreases e
 - This means that the exchange rate has *depreciated*, and thus the Canadian dollar has *appreciated*
- In the case of a flexible exchange rate system, then, the *exchange market* is always in *equilibrium* (and thus $BP = 0$)
 - Therefore, here the central bank plays a passive role in the determination of e

THE IMPACT OF AN INCREASE IN THE SUPPLY OF US DOLLARS

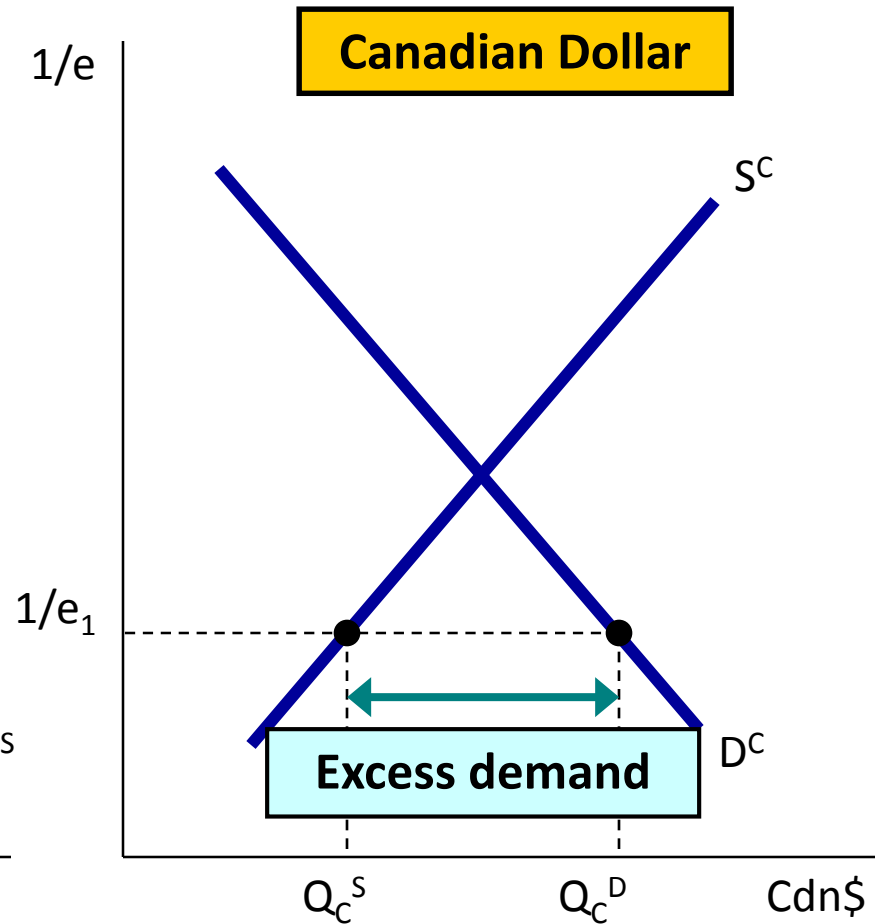
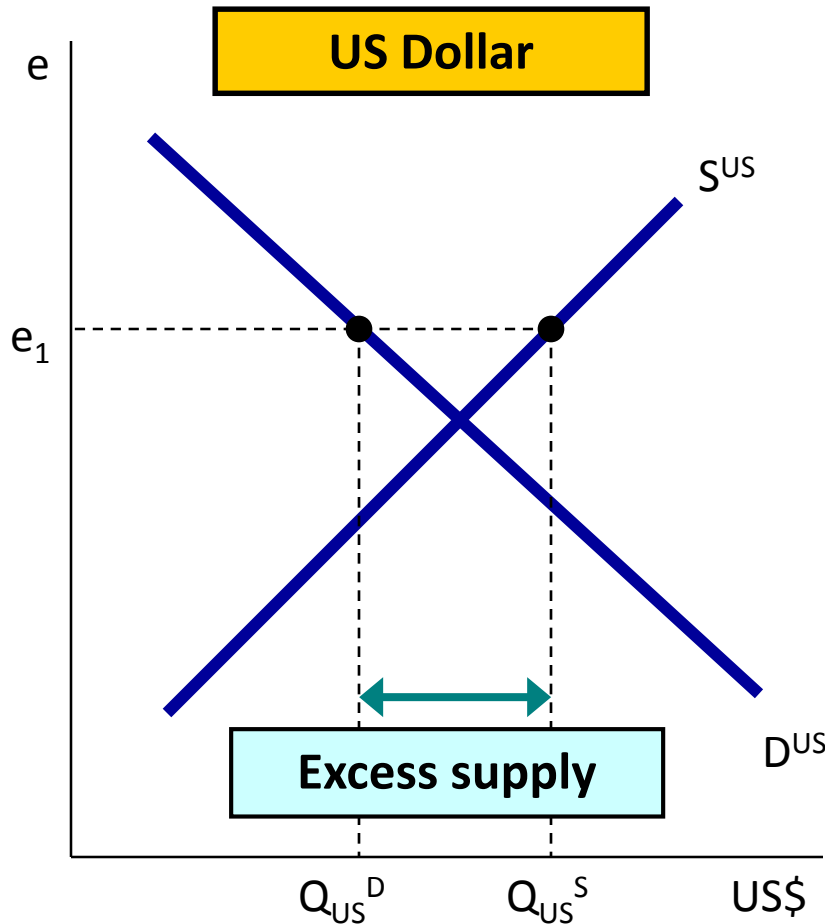


FIXED EXCHANGE RATE SYSTEM

- Under a *fixed exchange rate* system, the central bank sets the level of **e** independently of market forces
 - Therefore, at this level of **e** there could be an excess supply or demand in the exchange market
- Therefore, the central bank must buy foreign currency when there is an *excess supply* in the market
 - This means that the central bank will increase its reserves of foreign currency
- And the central bank must sell foreign currency when there is an *excess demand* in the market
 - This means that the central bank will reduce its reserves of foreign currency

THE DETERMINATION OF A FIXED EXCHANGE RATE

$$Q_C^D - Q_C^S = e_1 (Q_{US}^S - Q_{US}^D)$$

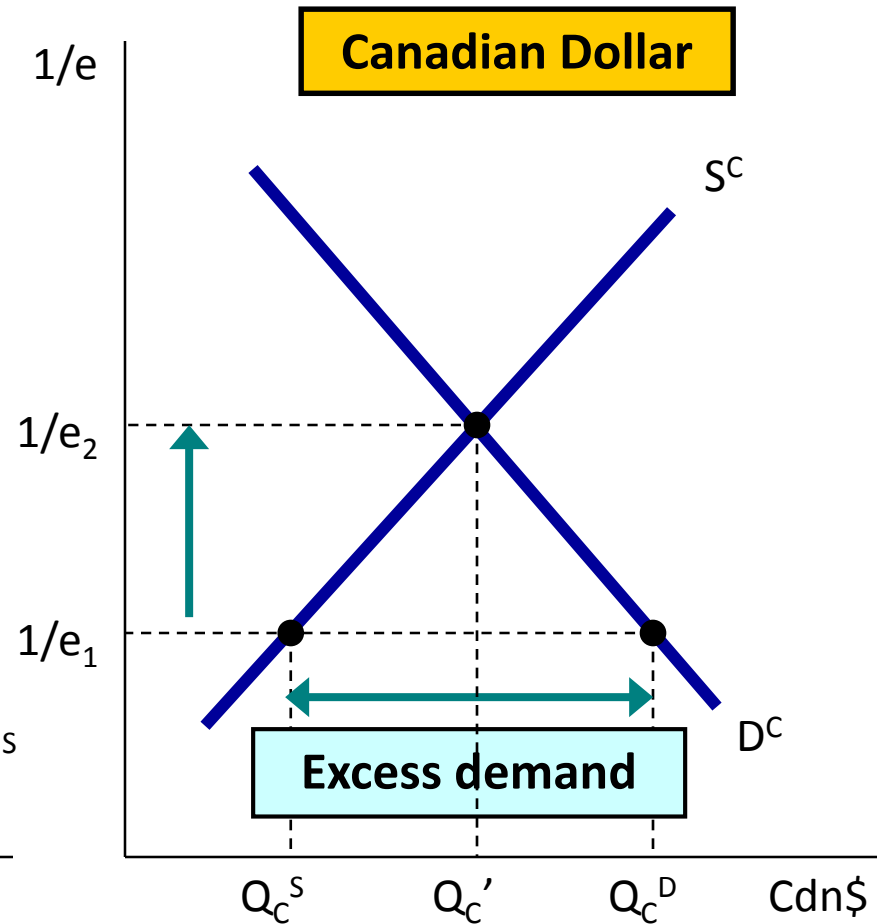
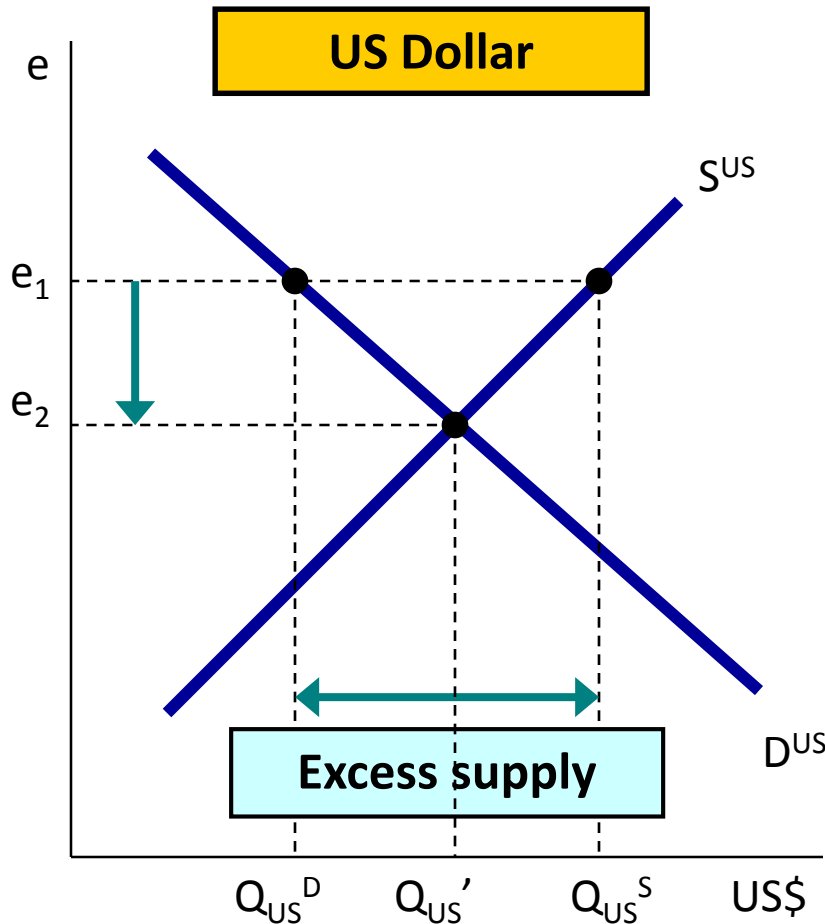


A CHANGE IN THE VALUE OF THE FIXED EXCHANGE RATE

- A fixed exchange rate does not mean that it cannot change
 - It means that it will not change due to changes in the demand or supply of foreign currency
 - It will only be changed by the Bank of Canada
- If the Bank of Canada increases the value of the exchange rate, this represents a **revaluation** of the exchange rate
 - This means a **devaluation** of the Canadian dollar
- If the Bank of Canada decreases the value of the exchange rate, this represents a **devaluation** of the exchange rate
 - This means a **revaluation** of the Canadian dollar

A DEVALUATION OF THE EXCHANGE RATE

A devaluation of the exchange rate implies a revaluation of the Canadian dollar. As a result, the excess supply of US dollars is reduced and/or eliminated.



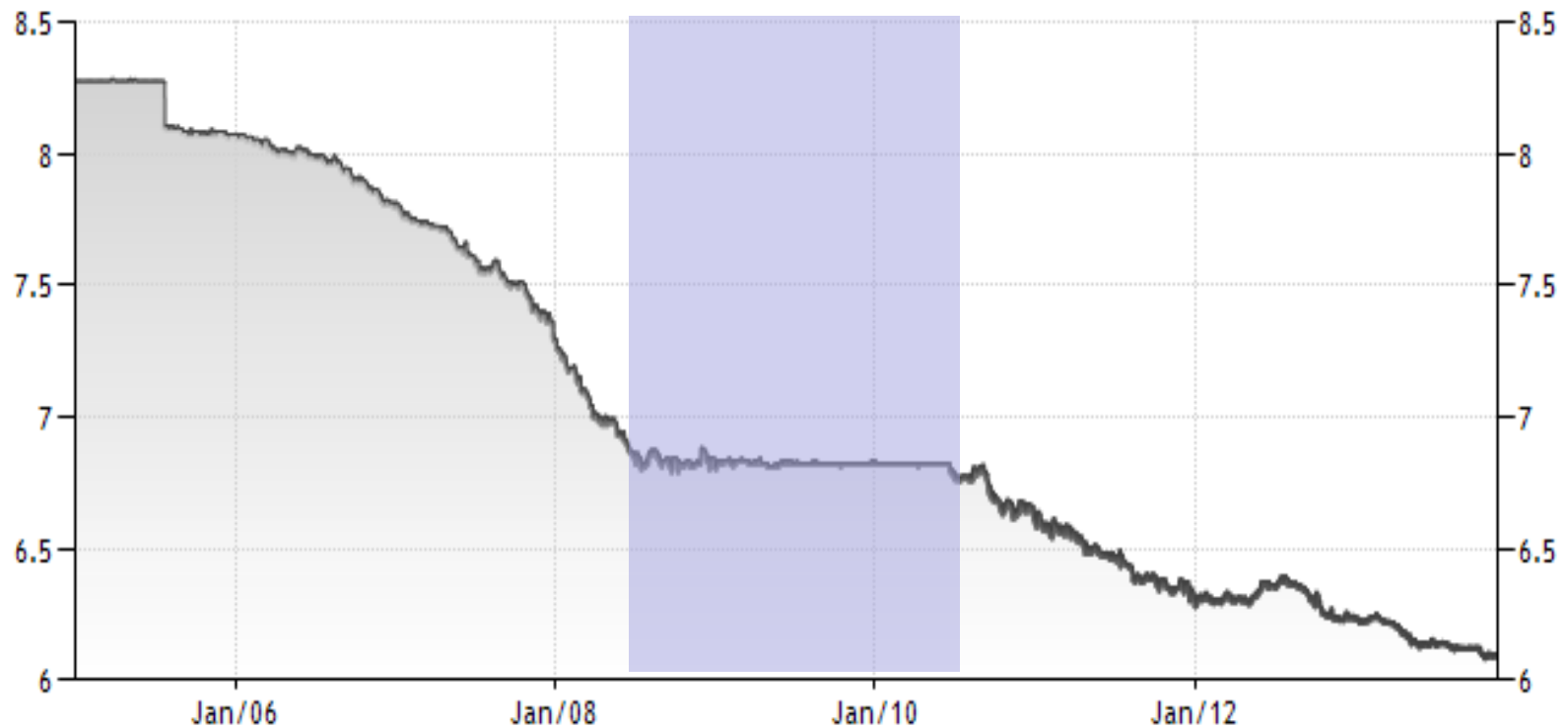
REAL EXCHANGE RATE

- A change in the **nominal** exchange rate indicates that the **price** of foreign currency has changed
 - By itself, this is not enough to determine whether domestic goods have become more or less expensive than foreign goods over a given period of time
- A change in the **real** exchange rate (**RER**) allows to determine whether domestic goods have become more or less expensive than foreign goods
 - The **RER** is the ratio of the foreign price level (measured in Canadian dollars) over the domestic price level :

$$RER = \frac{e P^f}{P}$$

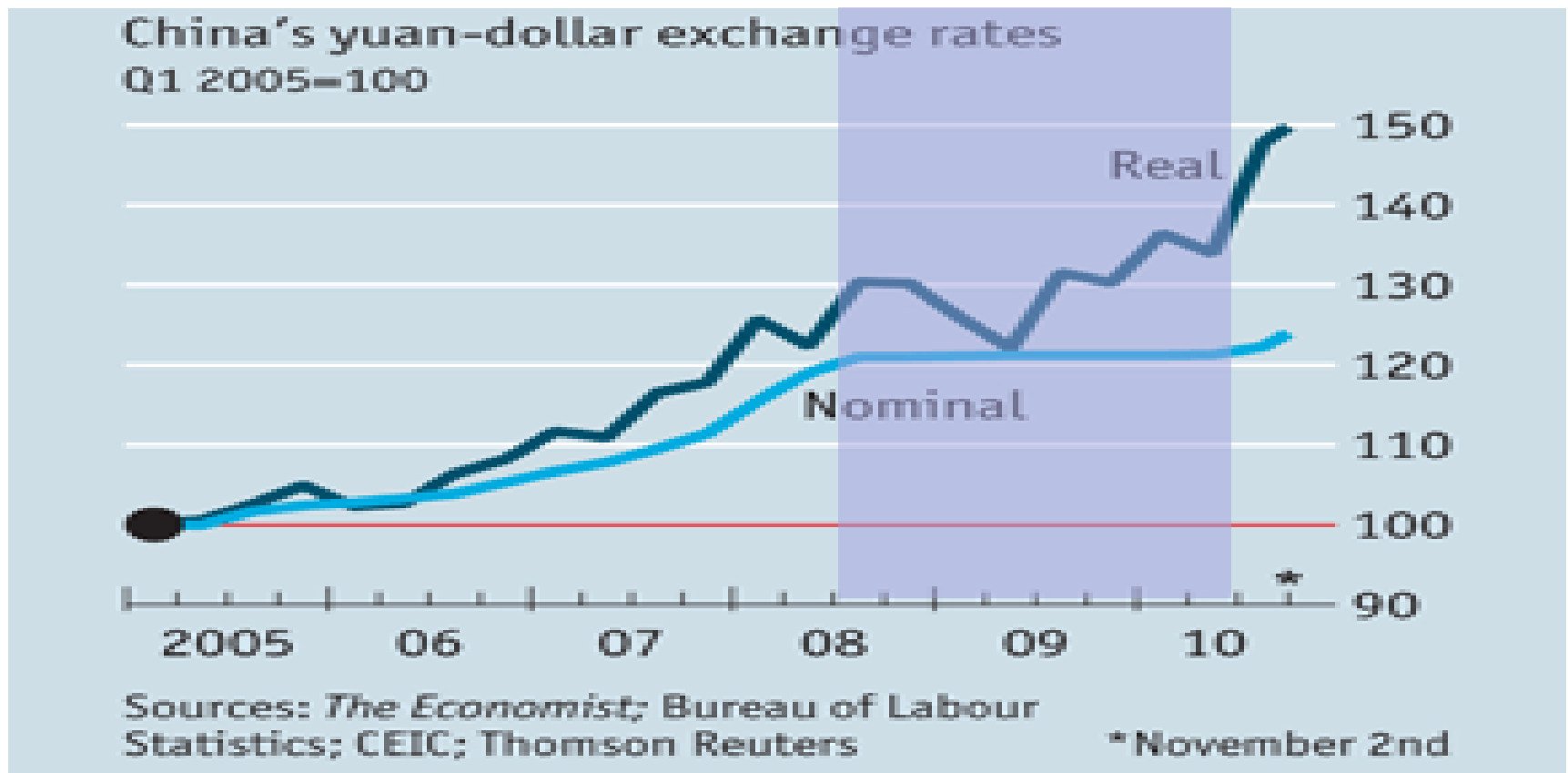
THE EXCHANGE RATE BETWEEN THE U.S. DOLLAR AND THE CHINESE YUAN

JANUARY 2005 TO NOVEMBER 2013

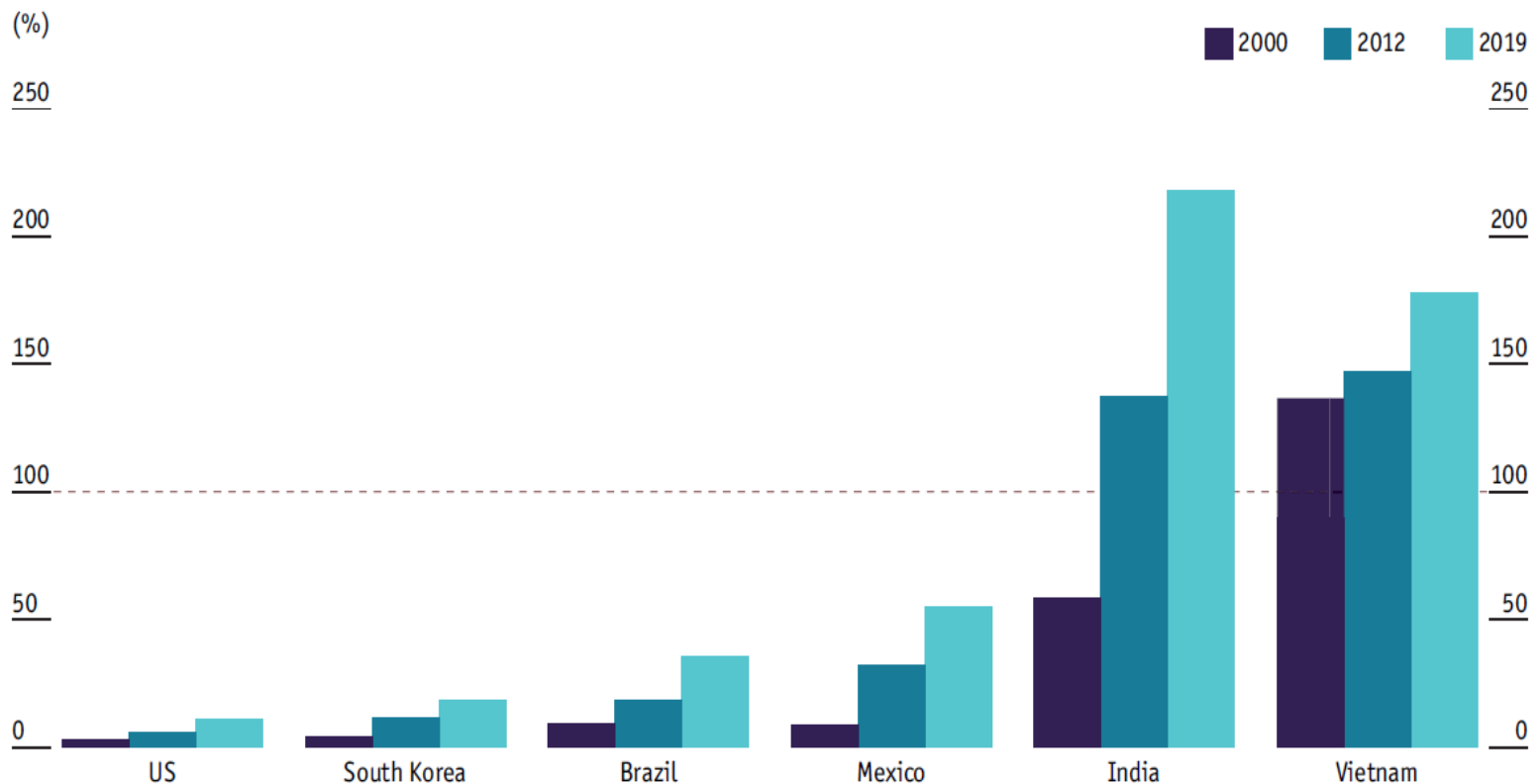


SOURCE: WWW.TRADINGECONOMICS.COM | OTC INTERBANK

THE REAL AND THE NOMINAL EXCHANGE RATE BETWEEN THE U.S. DOLLAR AND THE CHINESE YUAN

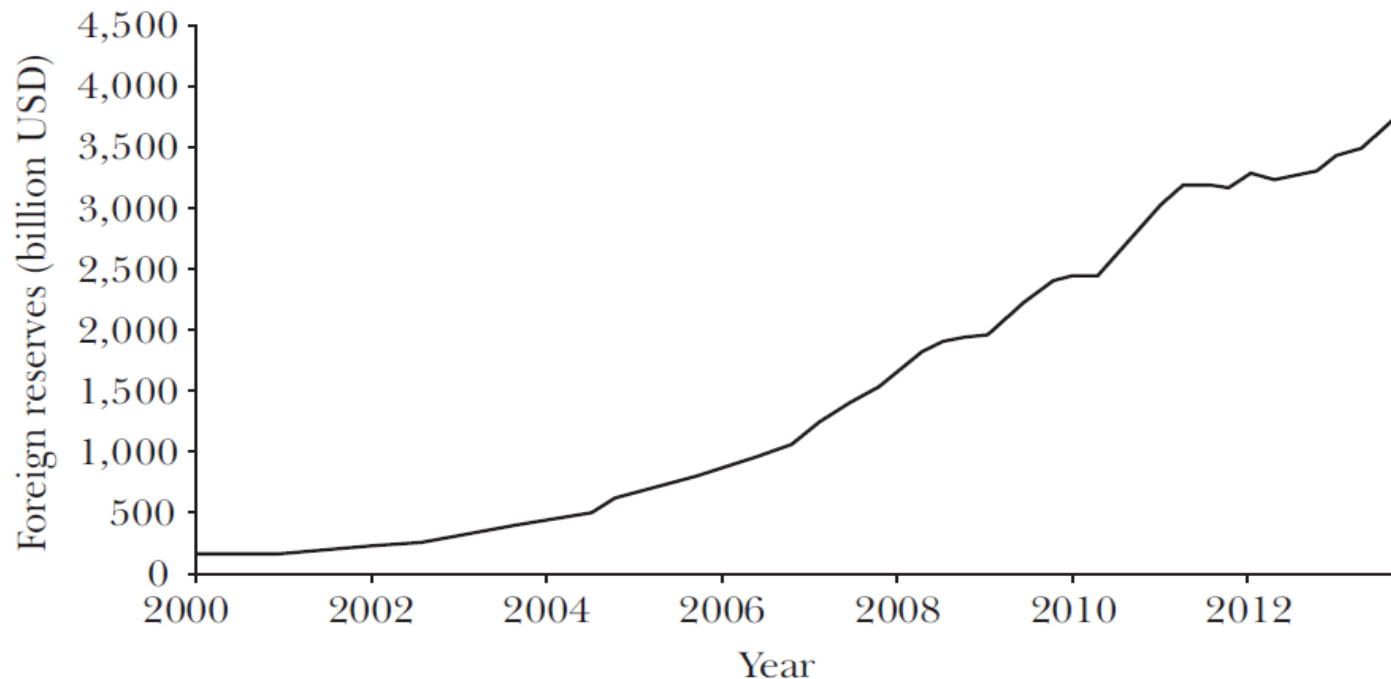


CHINA: MANUFACTURING LABOUR COST PER HOUR (AS A PROPORTION OF THOSE IN OTHER COUNTRIES)



Source: The Economist Intelligence Unit.

CHINA'S FOREIGN EXCHANGE RESERVES (2000-2013)



Source: Ronald I. McKinnon, "Near-zero U.S. Interest Rates, Primary Commodity Prices, and Financial Control in Emerging Markets," *Economic and Political Studies*, Vol. 2, No. 2, 2014, pp. 3-25.

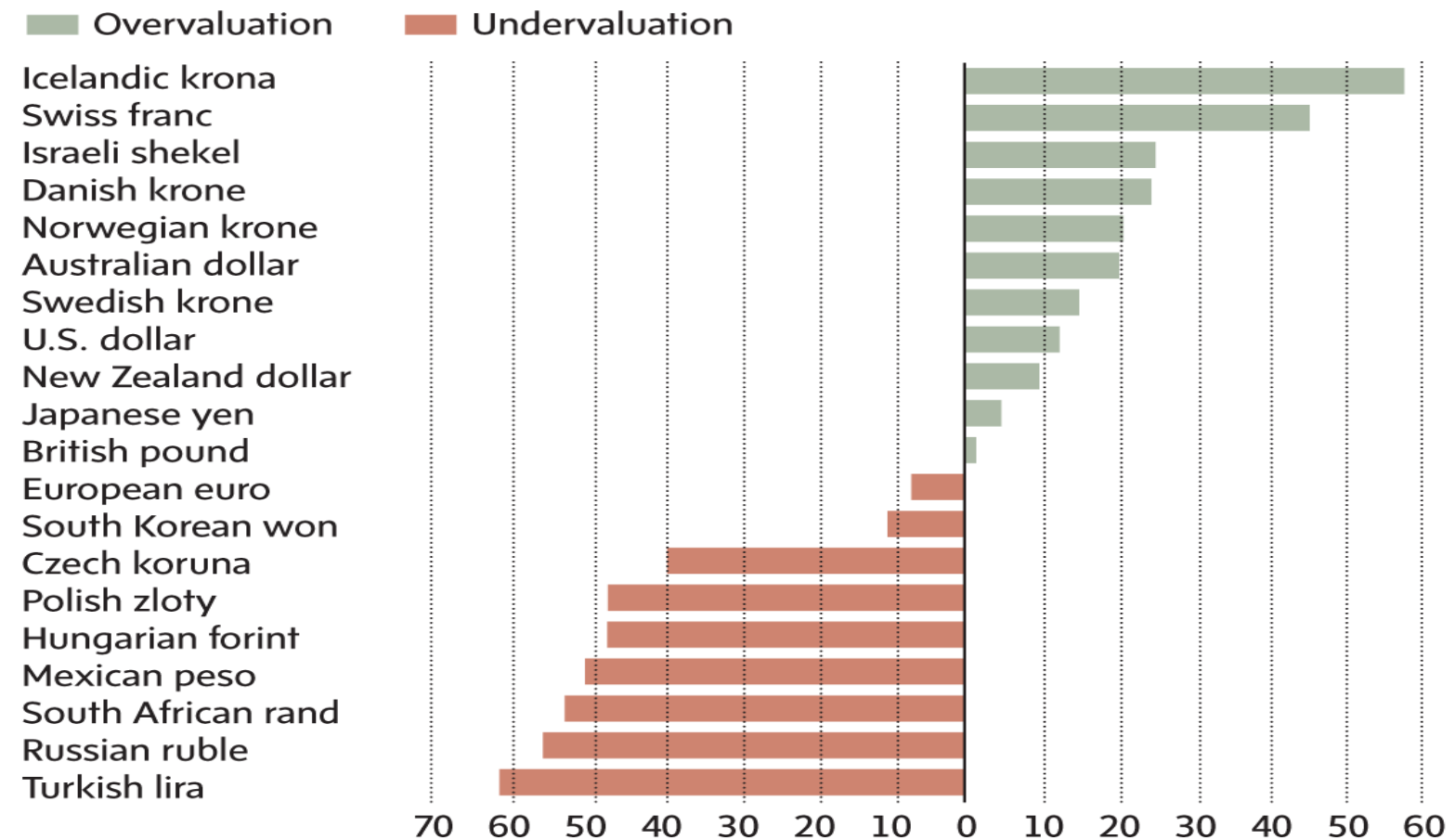
PURCHASING POWER PARITY EXCHANGE RATE

- Overvaluation or undervaluation of e could give us a wrong estimate of the purchasing power of a country's Y per capita
 - This could be corrected by calculating the *Purchasing Power Parity* exchange rate (e_{PPP})
- The e_{PPP} indicates the value of e that would make the price of a particular basket of goods equal in two countries (home and foreign, H and F)
 - P^H and P^F are the prices of this basket in the two countries in terms of their respective domestic currencies
- Therefore, the value of the exchange rate that would make these two prices equal in both countries:

$$e_{PPP} P_F = P_H \text{ and thus } e_{PPP} = P_H / P_F$$

PURCHASING POWER PARITY

CURRENCY VALUATIONS RELATIVE TO THE LOONIE (MAY 2017)



THE GLOBE AND MAIL, SOURCE: UBC SCHOOL OF BUSINESS

PPP REFERENCE YEAR: 2015

THE IS-LM-BP MODEL

- We will now extend our **IS-LM** model to include the external sector
 - We will derive the **IS-LM-BP** model
- We will examine this model under two different set of *assumptions*:
 - First, under the assumption of a *fixed exchange rate* system
 - Second, under the assumption of a *flexible exchange rate* system