International Economics - B.Sc. IB
8. Open-Economy Macroeconomics: National Accounting and Balance of Payment. Exchange Rates

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Economics Department CBS

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Plan for Today

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Chapter 13:

- National income accounts
- National saving, investment, and the current account

Chapter 14:

- Exchange rate
- The foreign exchange market
- The demand of currency deposits

Chapter 13. National Income Accounting and the Balance of Payments

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Chapter 13. National Income Accounts

National Income

- Definition: *income earned by factors of production of a nation*
- amount of expenditure by buyers ($C + I + G + CA$)= amount of income for sellers ($F\,(factors)$) = value of production (Y)

Gross National Product (GNP) (1)

GNP is the value of all final goods and services produced by a nation's factors of production.
Factors of production are:

1. human capital
2. physical capital K (better without depreciation δ (GNP adjusted))
3. natural resources
4. others (e.g. unilateral transfers (GNP adjusted))

Problem: physical capital is often constructed using the following formula $K_t = (1 - \delta) K_{t-1} + I_{t-1}$ (Burda and Severgnini, 2014)

Gross National Product (GNP) (2)

$$GNP = C + I + G + CA$$

where

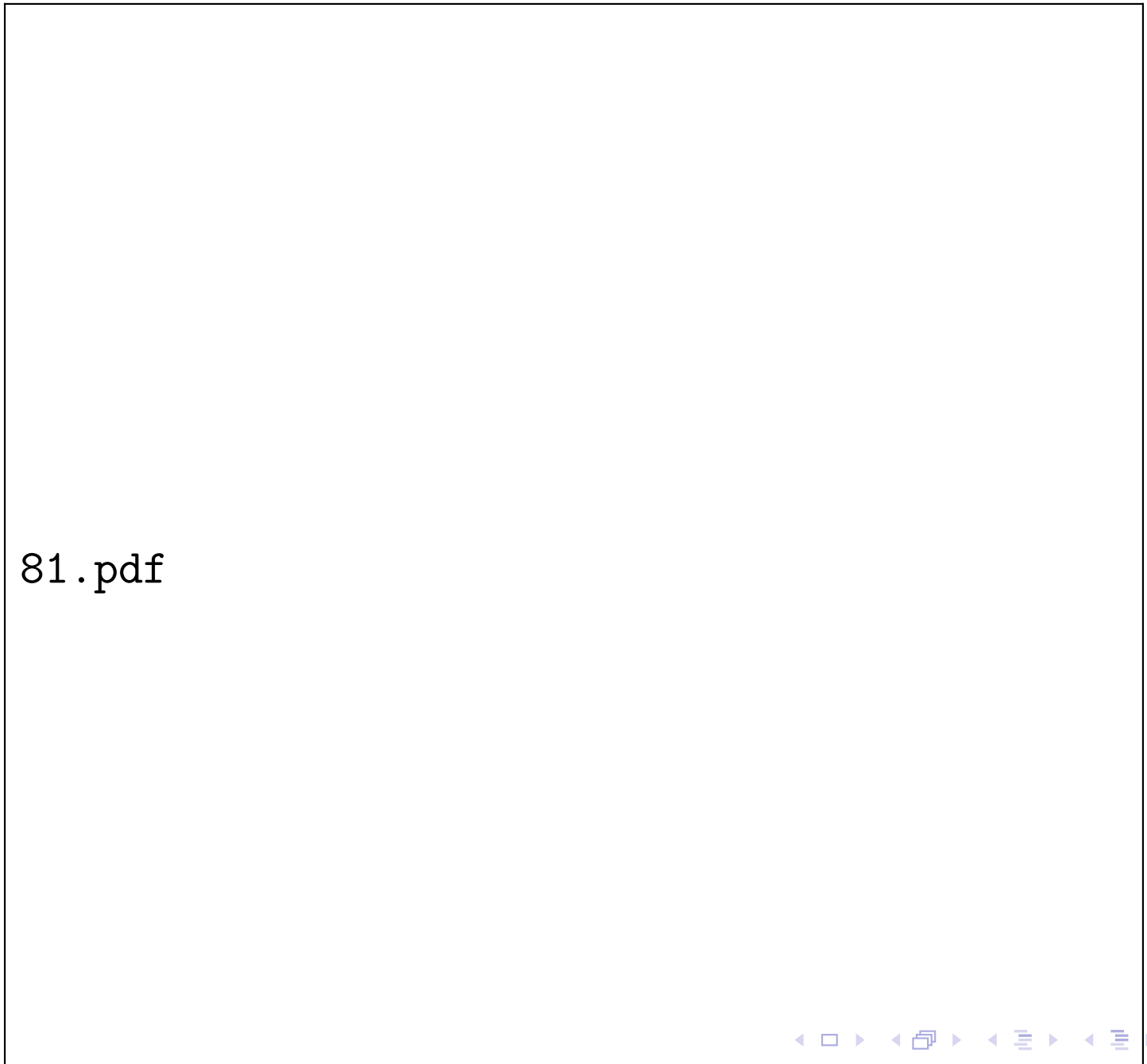
- C is consumption
- I is investment
- G is government purchases
- CA is current account balance (exports minus imports)

Gross National Product (GNP) (3)

$$GNP = C + I + G + CA$$

$$= C + I + G + EX - IM$$

Fig. 13-1: U.S. GNP and Its Components



Gross Domestic Product (GDP) (1)

- GDP product measures the final value of all goods and services that are produced within a country in a given time period.
- GDP = GNP - payments from foreign countries for factors of production + payments to foreign countries for factors of production

National Saving, Investment, and the Current Account

Gross Domestic Product (GDP) (2)

$$CA = EX - IM = Y - (C + I + G)$$

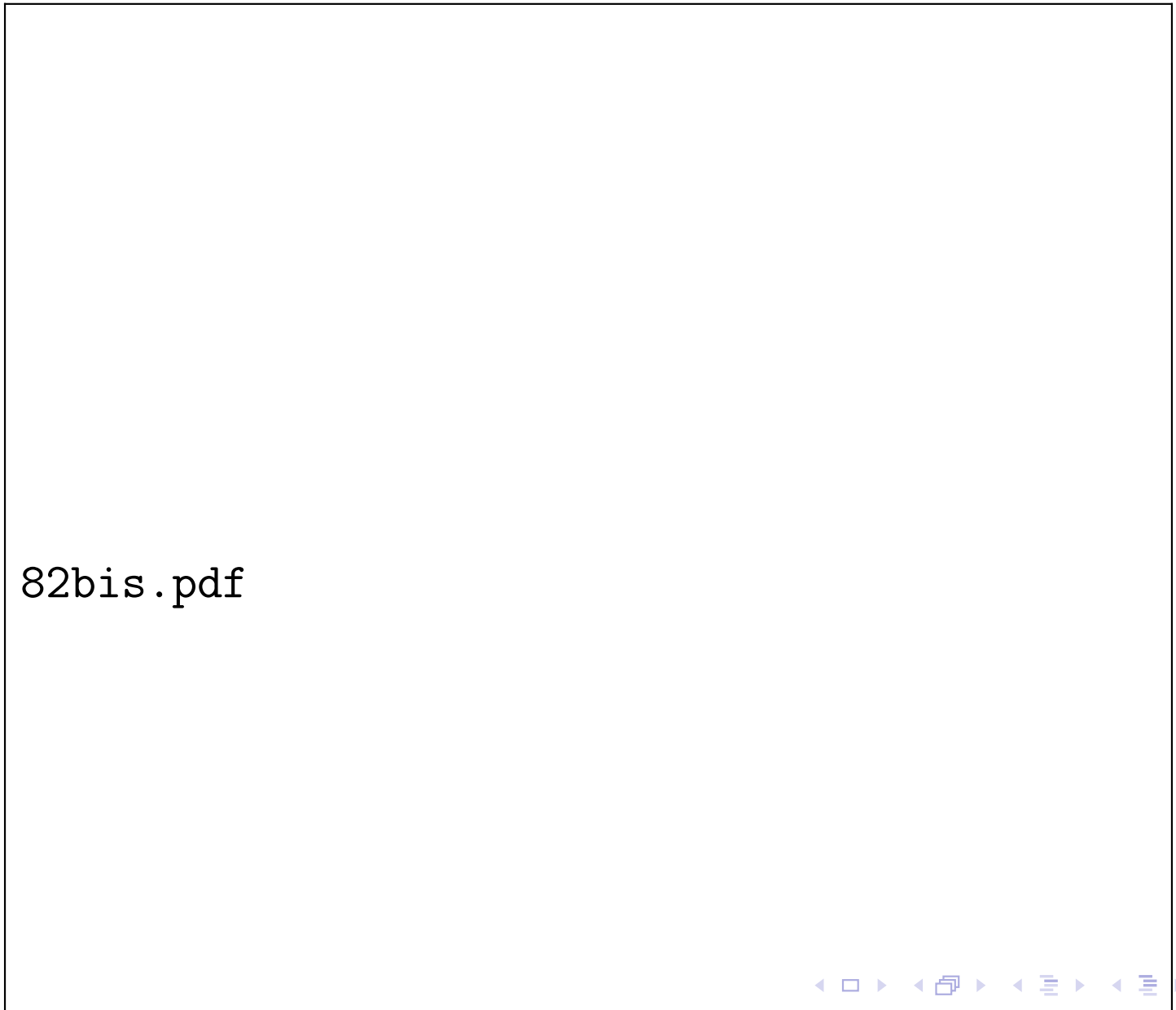
When production $>$ domestic expenditure, exports $>$ imports: current account > 0 and trade balance > 0

- if $Y > (C + I + G) \Rightarrow EX > IM \Rightarrow CA > 0$ (surplus)
- if $Y < (C + I + G) \Rightarrow EX < IM \Rightarrow CA < 0$ (deficit)

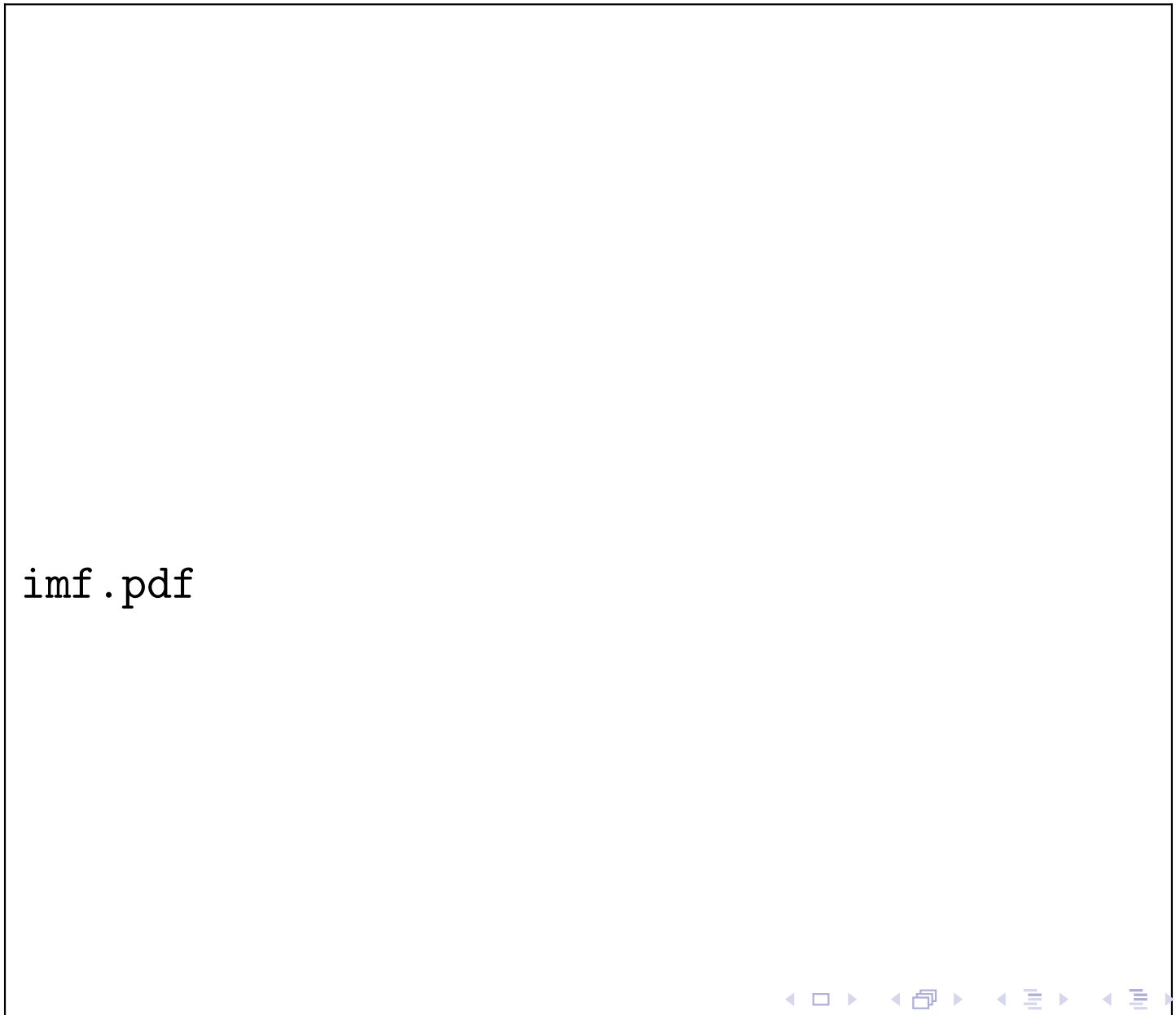
It is not possible for all countries to run deficits at the same time.

- Globally, deficits and surpluses balance.
- In recent years there have been some large surplus countries, and some large deficit countries: **global imbalances**.

Fig. 13-2: U.S. Current Account and Net Foreign Wealth, 1976-2009



Figure; Deficits and Surpluses: The Balance of Payments (Source: IMF, International Financial Statistics)



National Saving (S) and the Current Account

$$S = Y - C - G$$

$$S = (Y - C - T) + (T - G)$$

$$S = S^p + S^g$$

Current Account = National Saving Investment

$$CA = Y - (C + I + G)$$

$$CA = (Y - C - G) - -I$$

$$CA = S - I$$

or

$$S = CA + I$$

Countries can finance investment either by saving or by acquiring foreign funds equal to the current account deficit.

Current Account & National Saving

$$CA = S^p + S^g - I$$

Government deficit is negative. Government saving equal to $G - T$
A high government deficit causes a negative current account balance when other factors remain constant.

The Barro–Ricardo Equivalence (1)

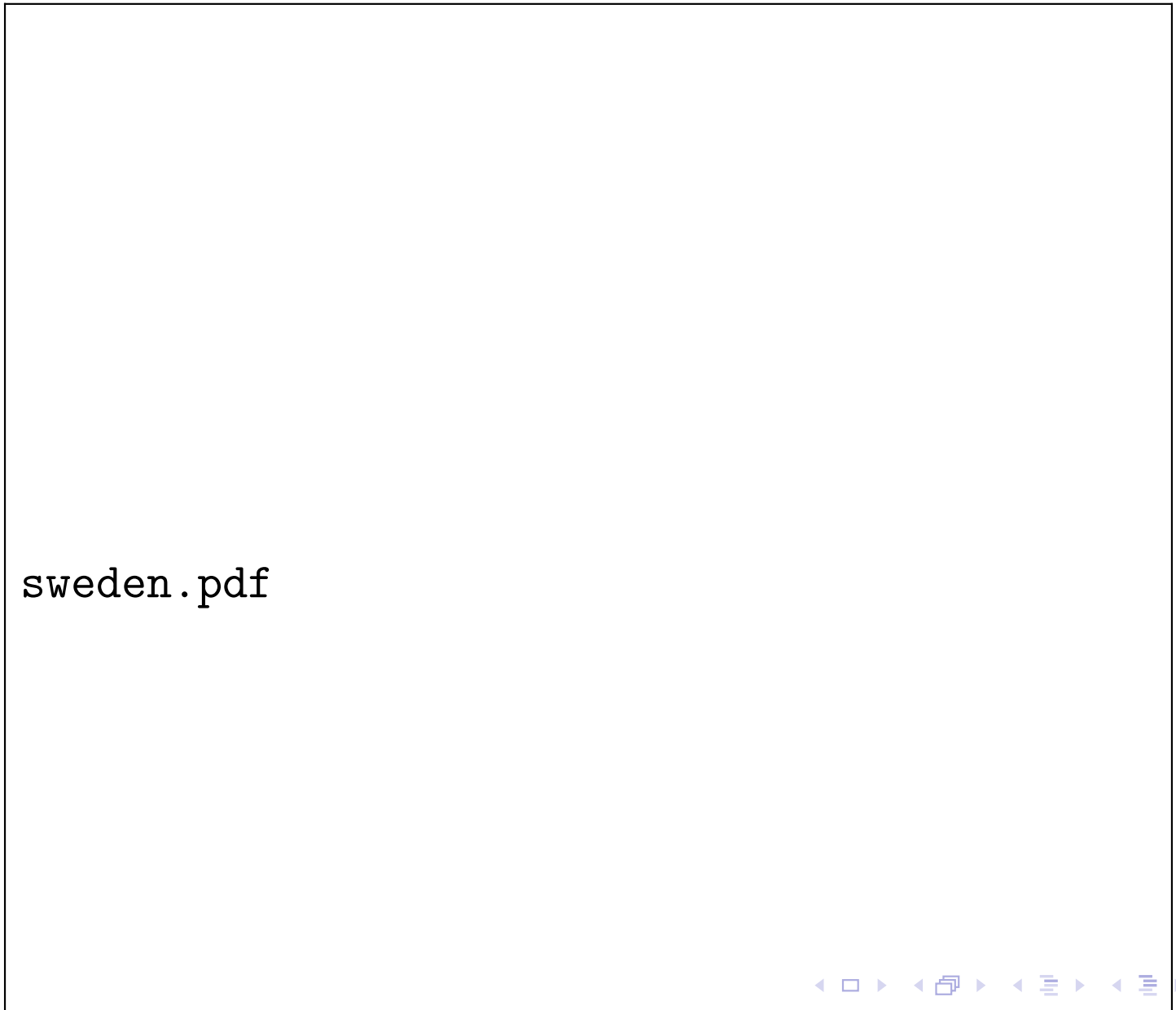
Barro (1989):

$$CA = S^p - I - (G - T)$$

$$(G - T) \Uparrow\Rightarrow S^p \Uparrow\Rightarrow CA \Leftrightarrow$$

Evidence for the EU (page 335)

The Barro–Ricardo Equivalence (2): Giavazzi and Pagano (1996)



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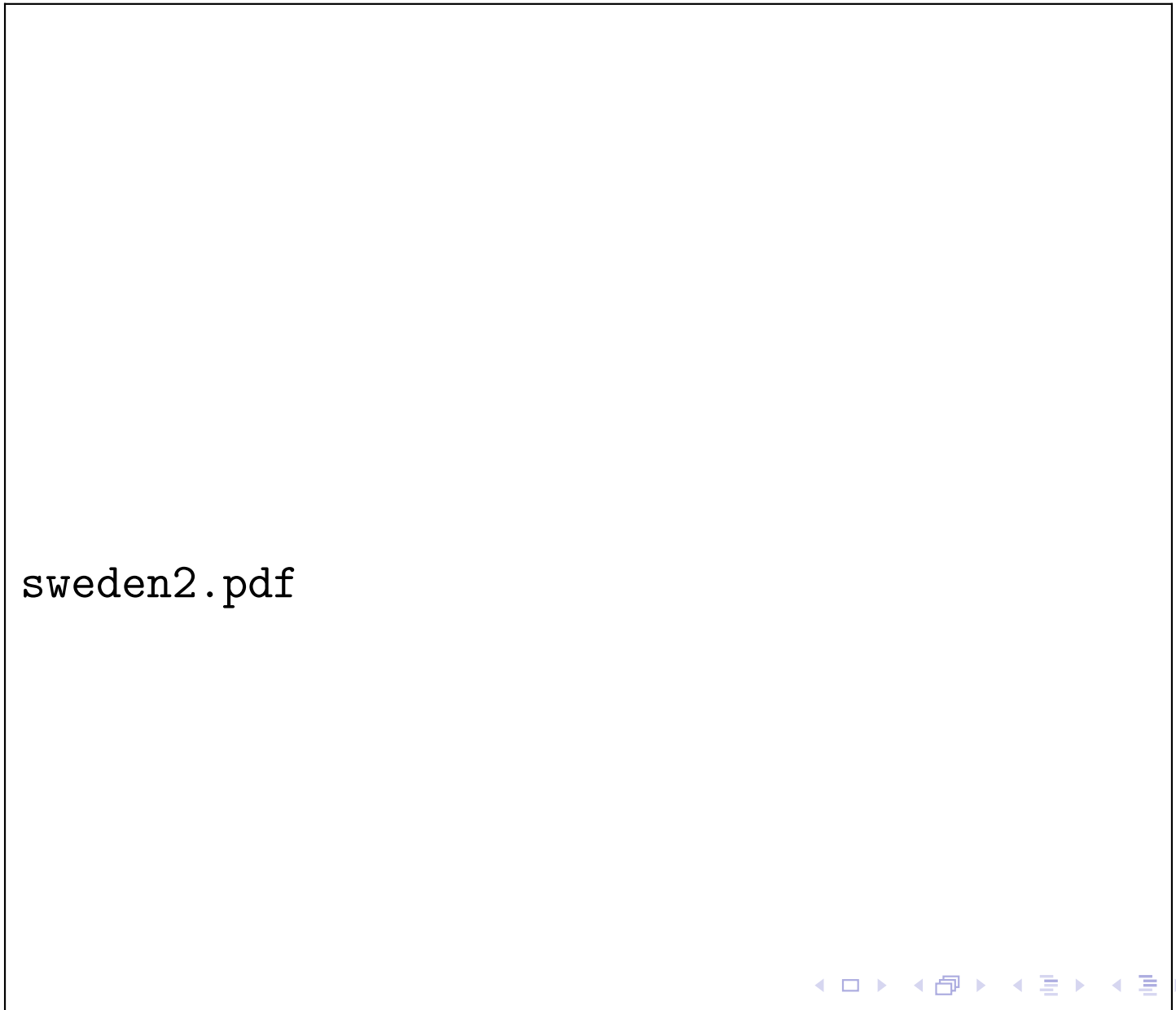

Balance of Payments Accounts

current account + financial account + capital account = 0

1. **current account**: accounts for flows of goods and services (imports and exports)
2. **financial account**: accounts for flows of financial assets (financial capital).
3. **capital account**: flows of special categories of assets (capital): typically non-market, non-produced, or intangible assets like debt forgiveness, copyrights and trademarks.

Example (1): Import a DVD from Japan by using your Debit Card

num1.pdf

Example (2): Invest in the Japanese stock market.

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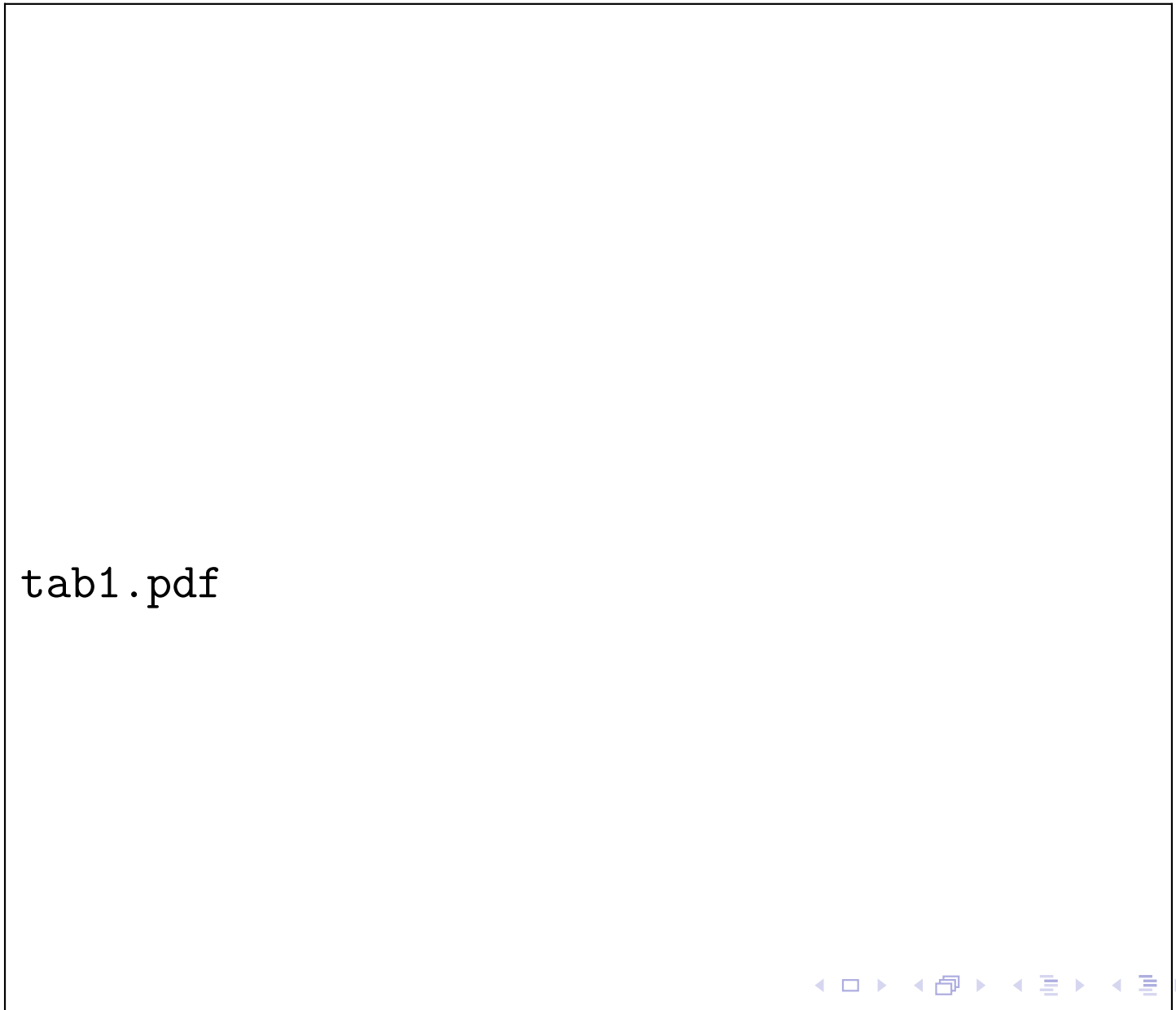
Example (3): Forgiving Argentinian Debt.

num2.pdf

U.S. Balance of Payments Accounts for 2006 (billions of dollars)



U.S. Balance of Payments Accounts for 2006 (billions of dollars)

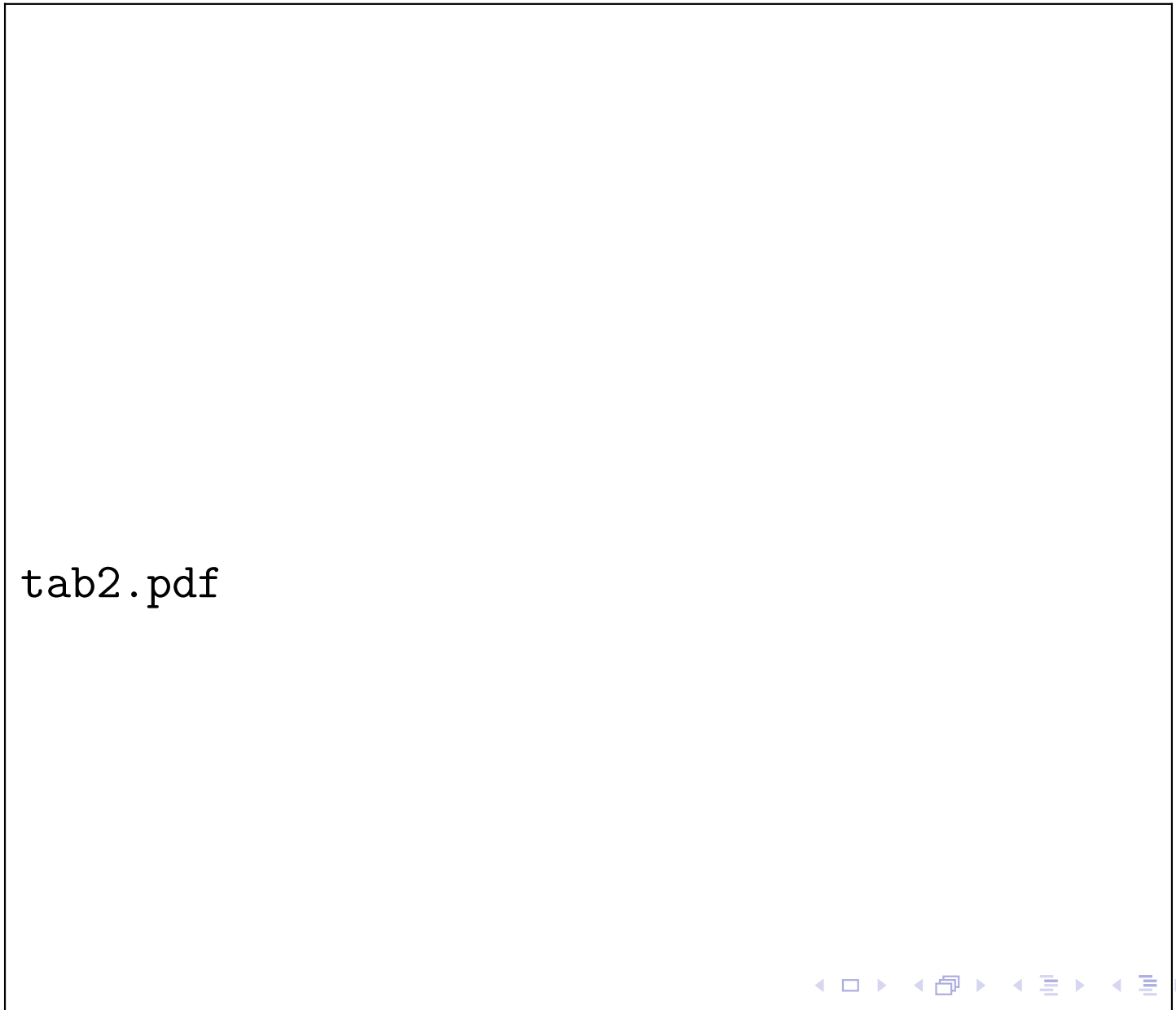
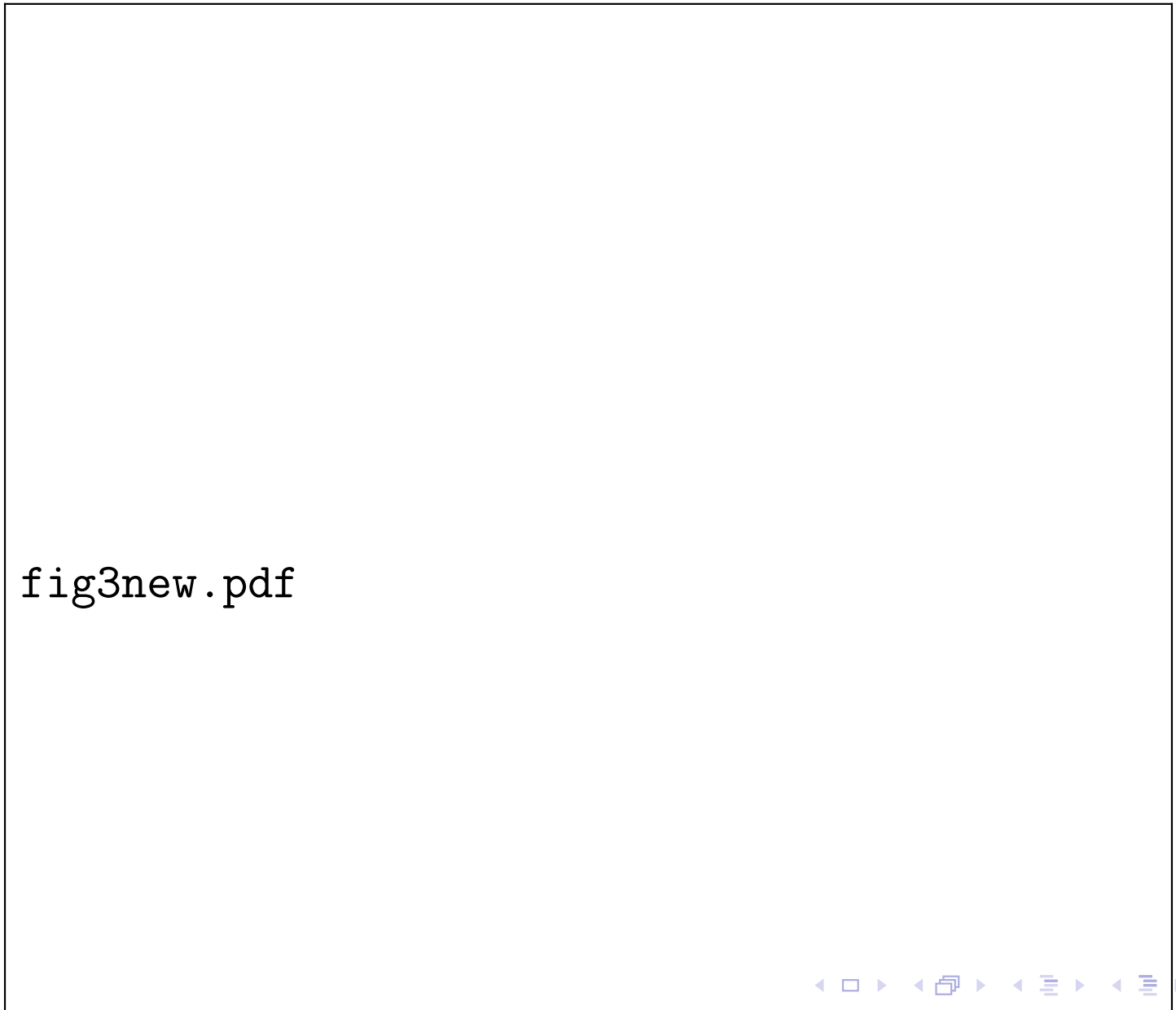


Fig. 13-3: U.S. Gross Foreign Assets and Liabilities, 1976–2009



Chapter 14. Exchange Rates and the Foreign Exchange Market: An Asset Approach

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Chapter 14. Exchange Rates

Exchange Rates

If you live in Denmark:

- **Direct**: The price of the foreign currency in terms of DKK (e.g., 7.45 DKK per Euro): $E_{DKK/EURO}$
- *Indirect* : The price of DKK in terms of the foreign currency (e.g., 0.13 Euro per 1 DKK)

Exchange rate regimes:

- *flexible*: Exchange rate is determined by the market
- *fixed*: Exchange rate is politically determined

Figure: Fixed and Floating Exchange Rate

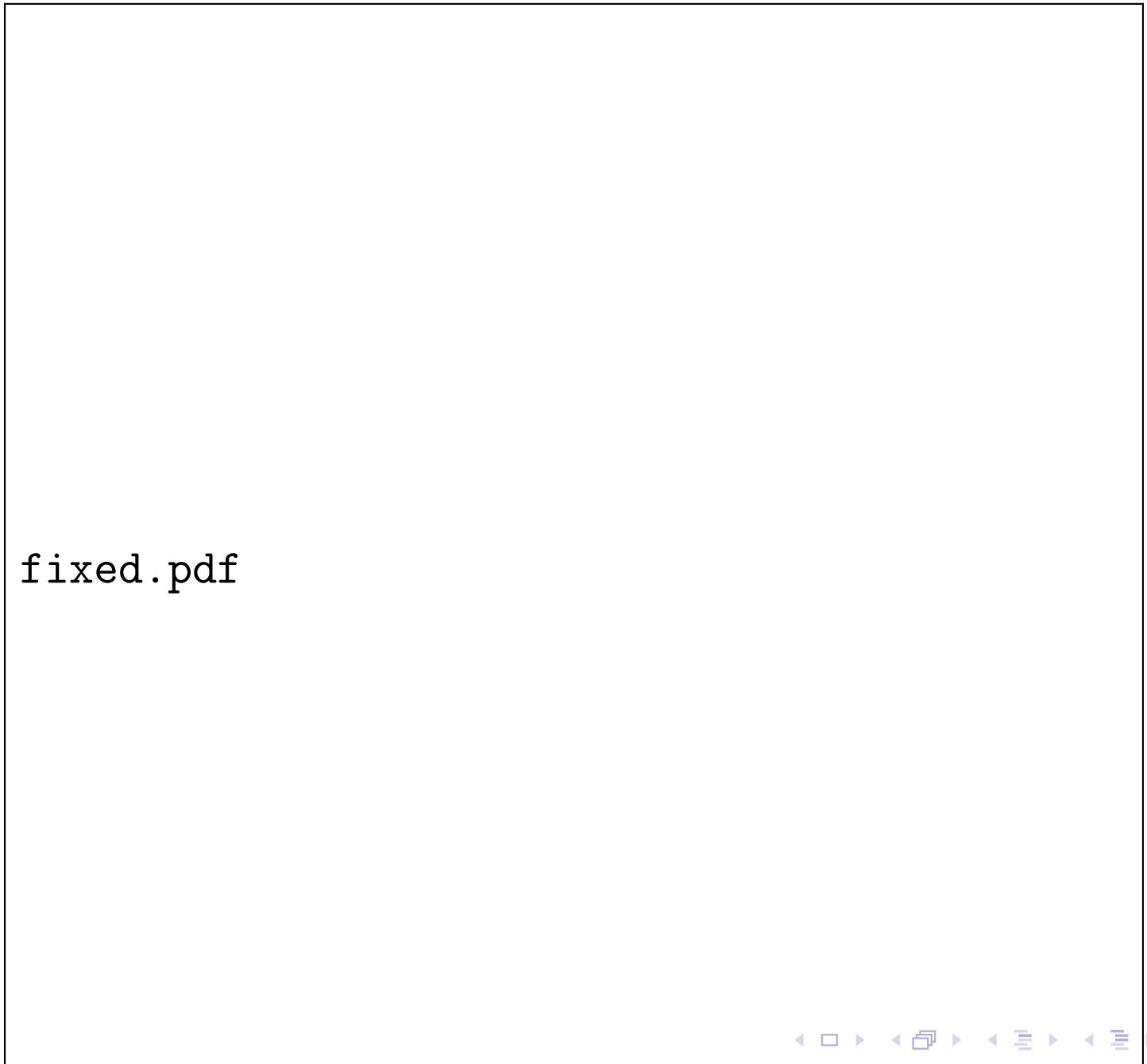

Table 14-1: Exchange Rate Quotations

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Depreciation and Appreciation

We are under **flexible exchange rates**:

1. **Depreciation** $E_{DKK/EURO} \Uparrow$ the Euro becomes more expensive, i.e., DKK becomes less valuable.
2. **Appreciation** $E_{DKK/EURO} \Downarrow$ the Euro becomes less expensive, i.e., DKK becomes more valuable.

Devaluation and Revaluation

We are under **fixed exchange rates**:

1. **Devaluation** $E_{DKK/EURO} \Uparrow$ the Euro becomes more expensive, i.e., DKK becomes less valuable.
2. **Revaluation** $E_{DKK/EURO} \Downarrow$ the Euro becomes less expensive, i.e., DKK becomes more valuable.

Chapter 14. The Foreign Exchange Market

The Foreign Exchange Market

Four actors:

1. **Commercial banks and other depository institutions**: transactions involve buying/selling of deposits in different currencies for investment purposes.
2. **Non-bank financial institutions** may buy/sell foreign assets for investment.
3. **Non-financial businesses** conduct foreign currency transactions to buy/sell goods, services and assets
4. **Central banks** conduct official international reserves transactions

ICT and the integration of markets imply that there is no significant *arbitrage*(=buying at a low price and selling at a high price for a profit) between markets.

When Exchange Rates Misbehave (1)

- **Exchange rate crises** occur when a currency experiences a sudden decrease in value against another currency.
  - Such crises are fairly common 19 crises 1980-2002
- Crises can have severe economic consequences.
  - Government default
  - Financial and banking collapses
  - Severe contraction in output and decline in real wages
- Politically embarrassing
  - Countries experiencing crises often seek help from international development agencies, such as the International Monetary Fund (IMF).

When Exchange Rates Misbehave (2). Source: IMF, International Financial Statistics.

exratemis.pdf

Case Study: Argentina (2001)

argentina.pdf

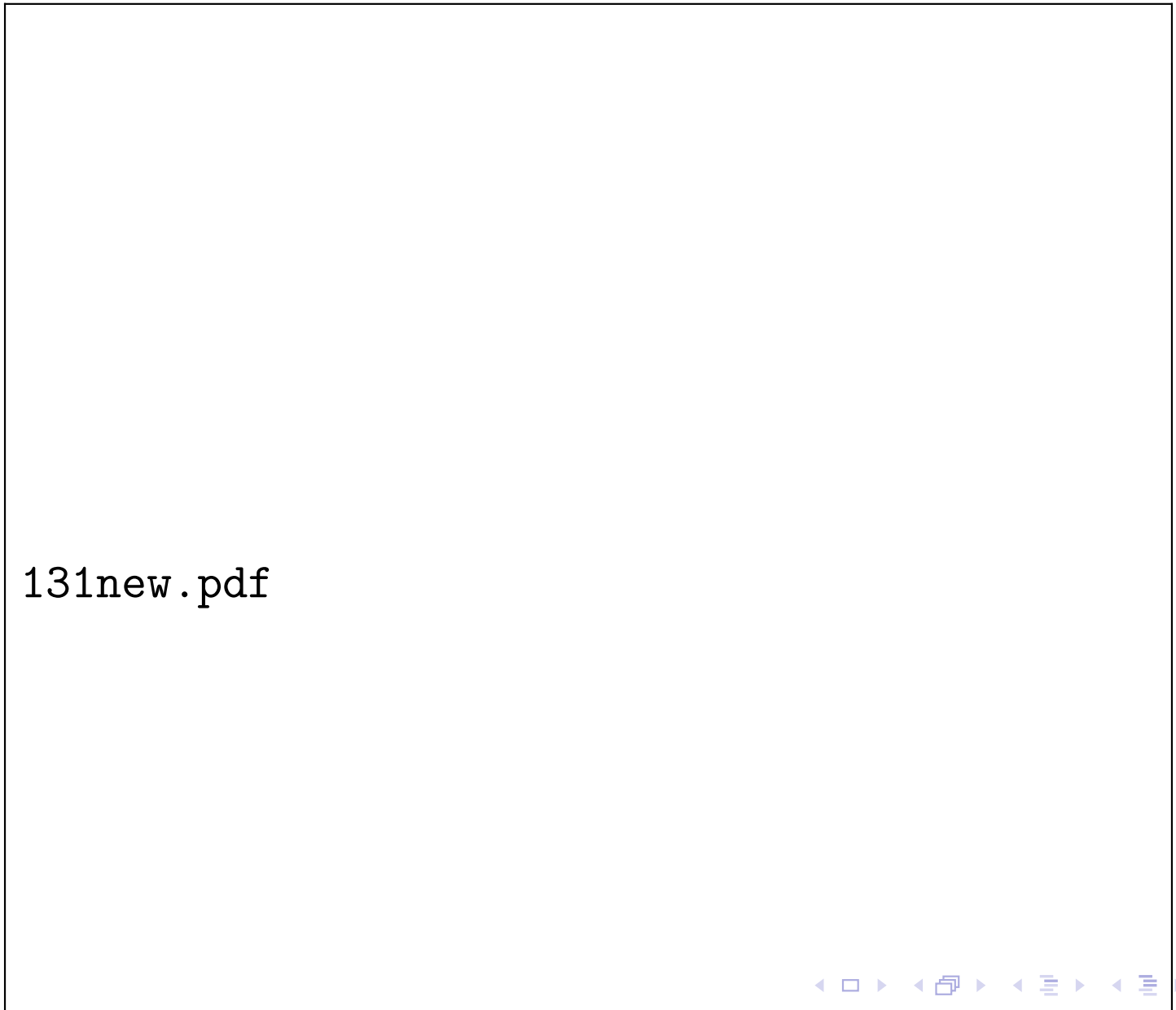
Spot and Forward Rates

- **Spot rates**: exchange rates for currency exchanges "on the spot", or when trading is executed in the present.
- **Forward rates**: may buy/sell foreign assets for investment.

Other methods:

1. Foreign exchange swaps
2. Futures contracts
3. Options contracts

Fig. 14-1: Dollar/Pound Spot and Forward Exchange Rates, 1981-2009



Chapter 14. The Demand of Currency Deposits

The Demand of Currency Deposits (1)

Factors that influence the return on assets determine the demand of those assets.

- **Rate of return:** the % change in value that an asset offers during a time period
- **Real rate of return:** inflation-adjusted rate of return
- if inflation=0 $\Rightarrow$ rate of return=real rate of return

The Demand of Currency Deposits (2)

Example: Should we invest in a Danish bond or an Euro bond?

- 1 DKK in DK bonds $\Rightarrow (1 + R_{DKK,t})$ DKK in a year
- 1 DKK in Euro bonds: $\Rightarrow \left(\frac{1}{E_{DKK/EURO,t}}\right)(1 + R_{EURO,t})$
- at time $t + 1$: $\Rightarrow E^e_{DKK/EURO,t+1}\left(\frac{1}{E_{DKK/EURO,t}}\right)(1 + R_{EURO,t})$
- No arbitrage: the two returns have to be equal

The Uncovered Interest Parity (1)

We can rewrite the relation as:

$$(1 + R_{DKK,t}) = E^{e}_{DKK/EURO,t+1} \left(\frac{1}{E_{DKK/EURO,t}} \right) (1 + R_{EURO,t})$$

$$\Rightarrow$$

$$(1 + R_{DKK,t}) = (1 + R_{EURO,t}) \left(\frac{E^{e}_{DKK/EURO,t+1}}{E_{DKK/EURO,t}} \right)$$

Taking logs,

$$R_{DKK,t} \approx R_{EURO,t} + \left(\frac{E^{e}_{DKK/EURO,t+1} - E_{DKK/EURO,t}}{E_{DKK/EURO,t}} \right)$$

The Uncovered Interest Parity (2)

In other words, arbitrage ensures that the domestic interest rate equals the foreign interest rate plus the expected percentage depreciation of the domestic currency.

- $E^{e}_{DKK/EURO,t+1} = E_{DKK/EURO,t} \Rightarrow R_{DKK,t} = R_{EURO,t}$

Table 14-3: Comparing Dollar Rates of Return on Dollar and Euro Deposits

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Equilibrium in the Foreign Exchange Market

The Equilibrium Exchange Rate

- Exchange rates always adjust to maintain interest parity.
- Assume that the DKK interest rate R_{DKK}, the Euro interest rate R_{EURO}, and the expected future DKK/EURO exchange rate E_e, are all given

Table 14-4:

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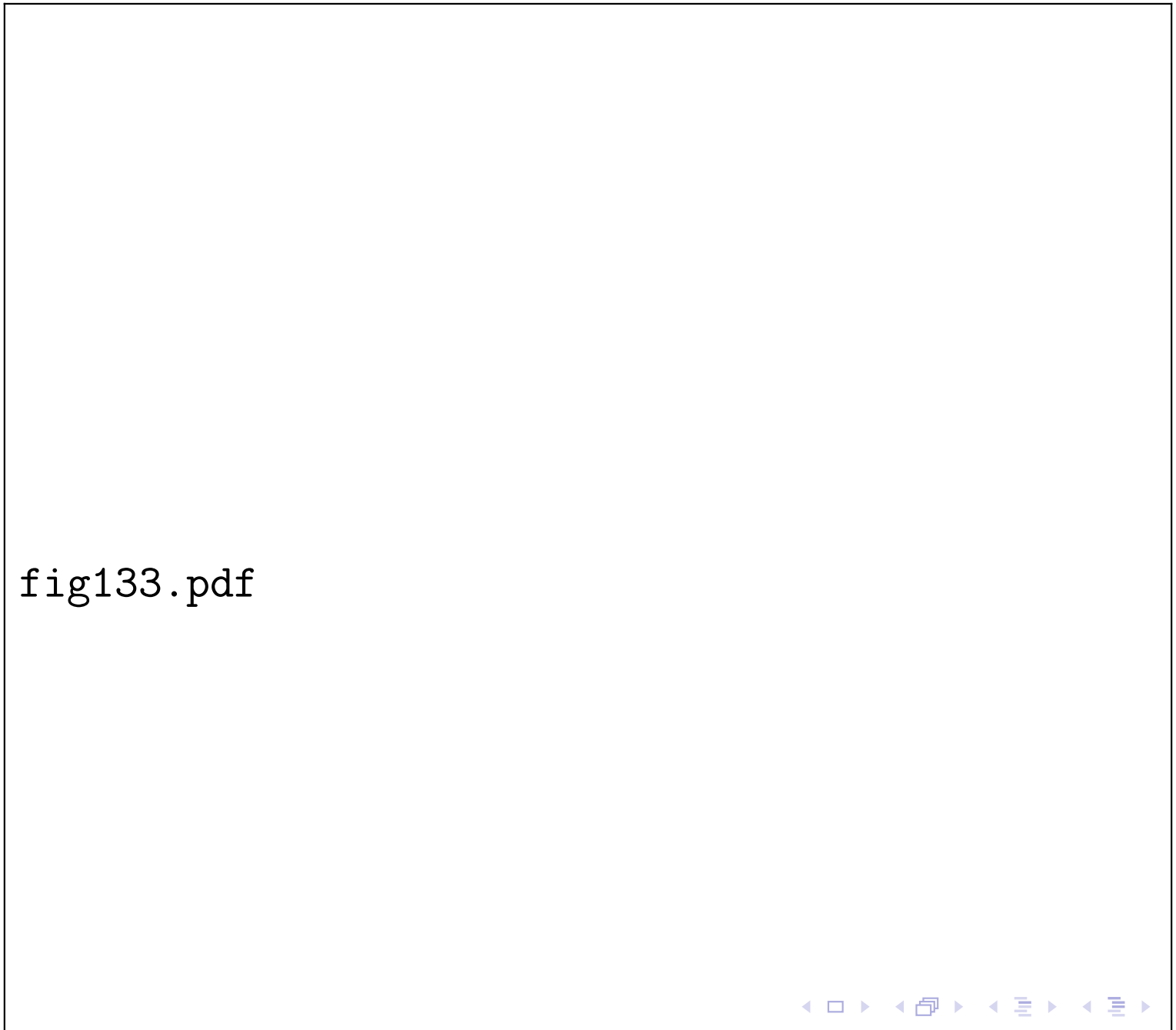
Fig. 14-3



The Current Exchange Rate and the Expected Rate of Return on Dollar Deposits

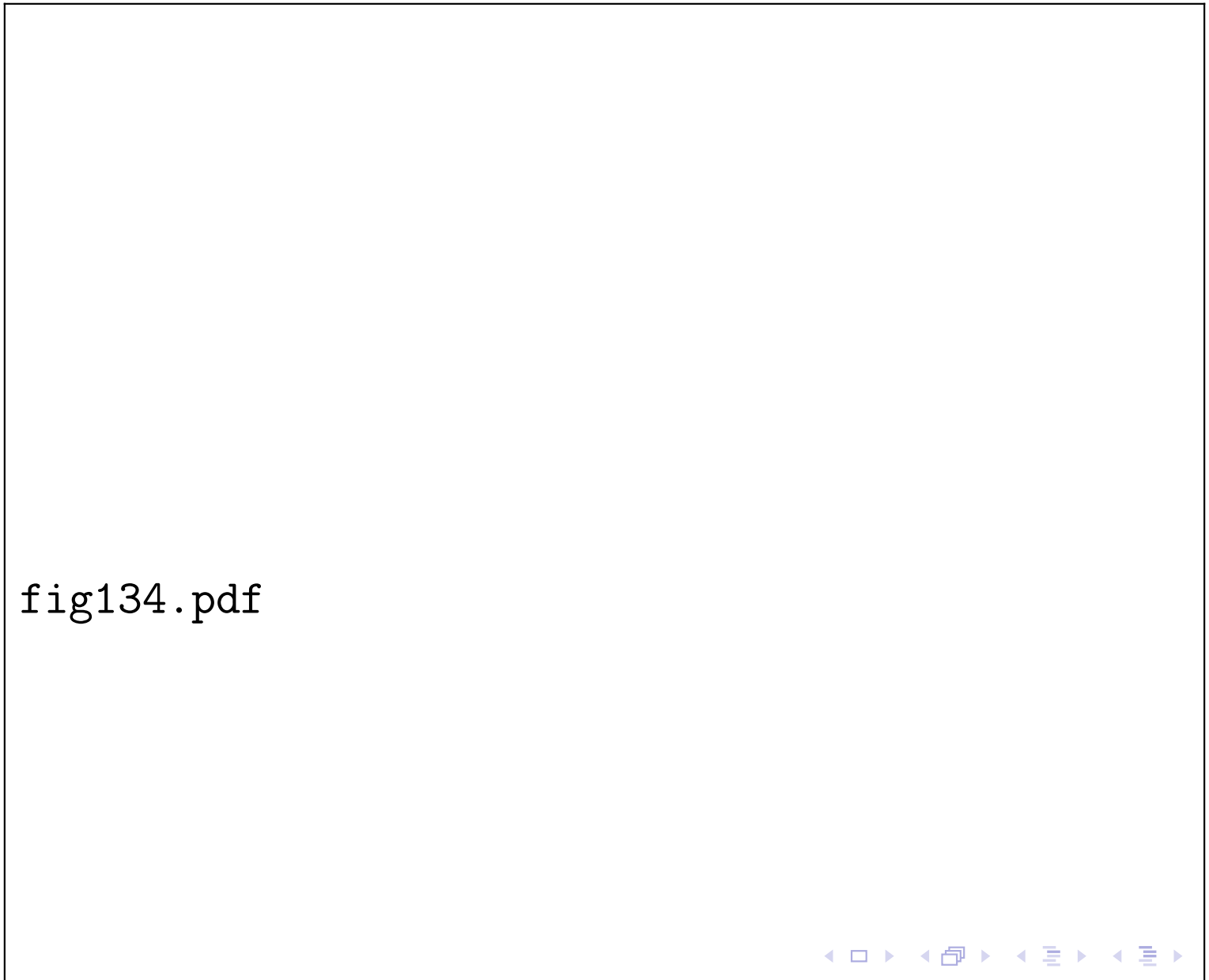
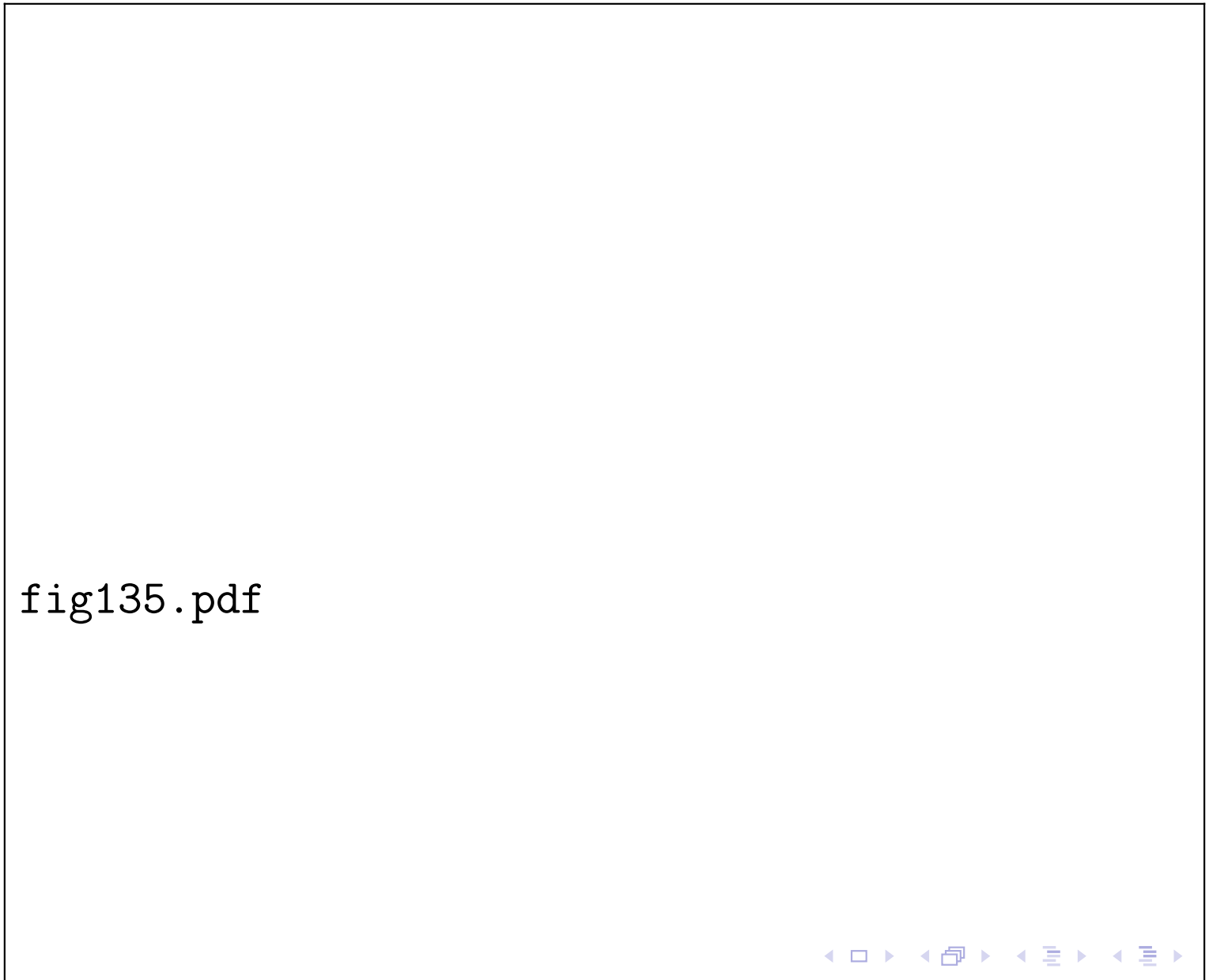


Fig. 14-4: Determination of the Equilibrium Dollar/Euro Exchange Rate

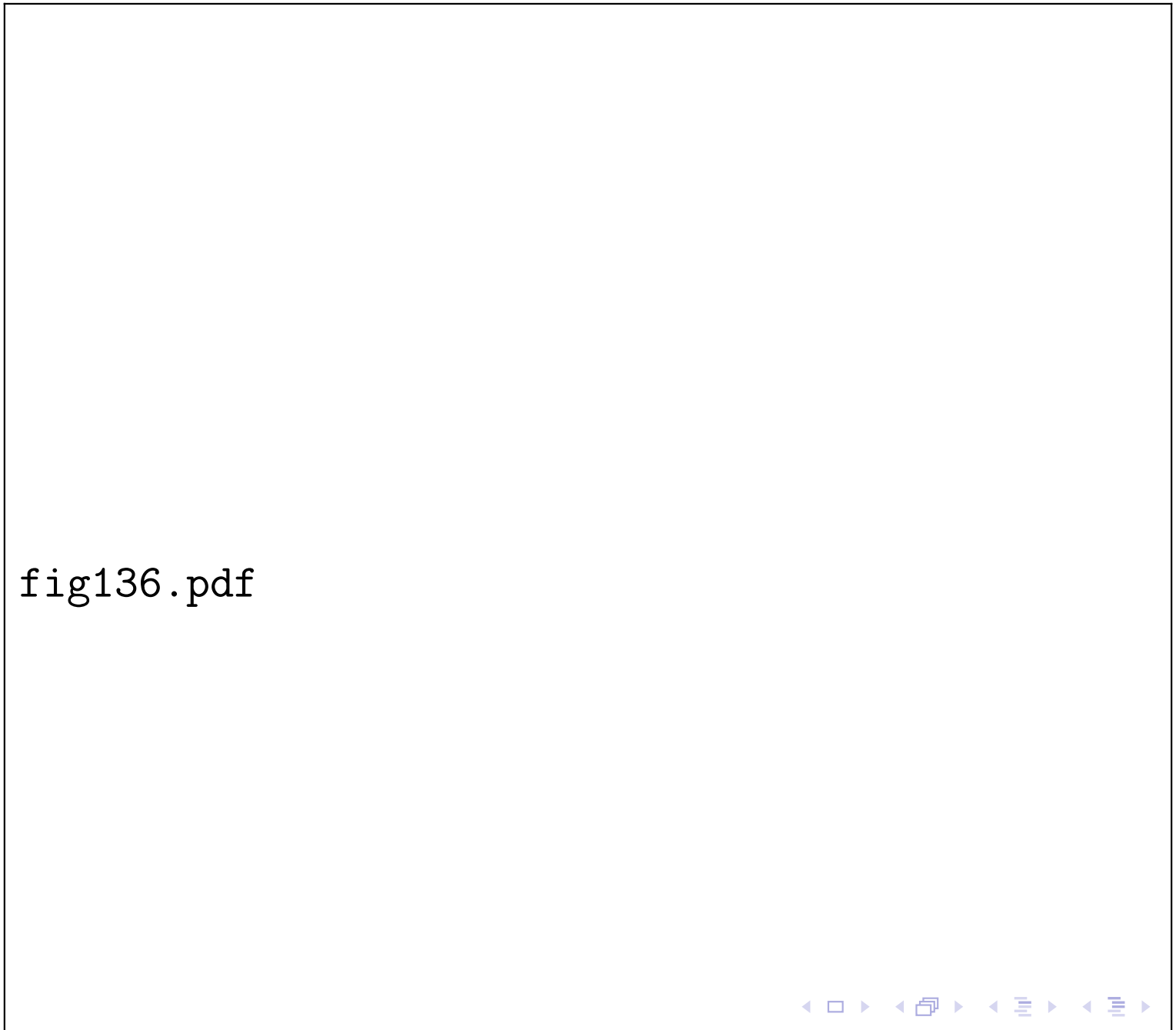


Model of Foreign Exchange Markets

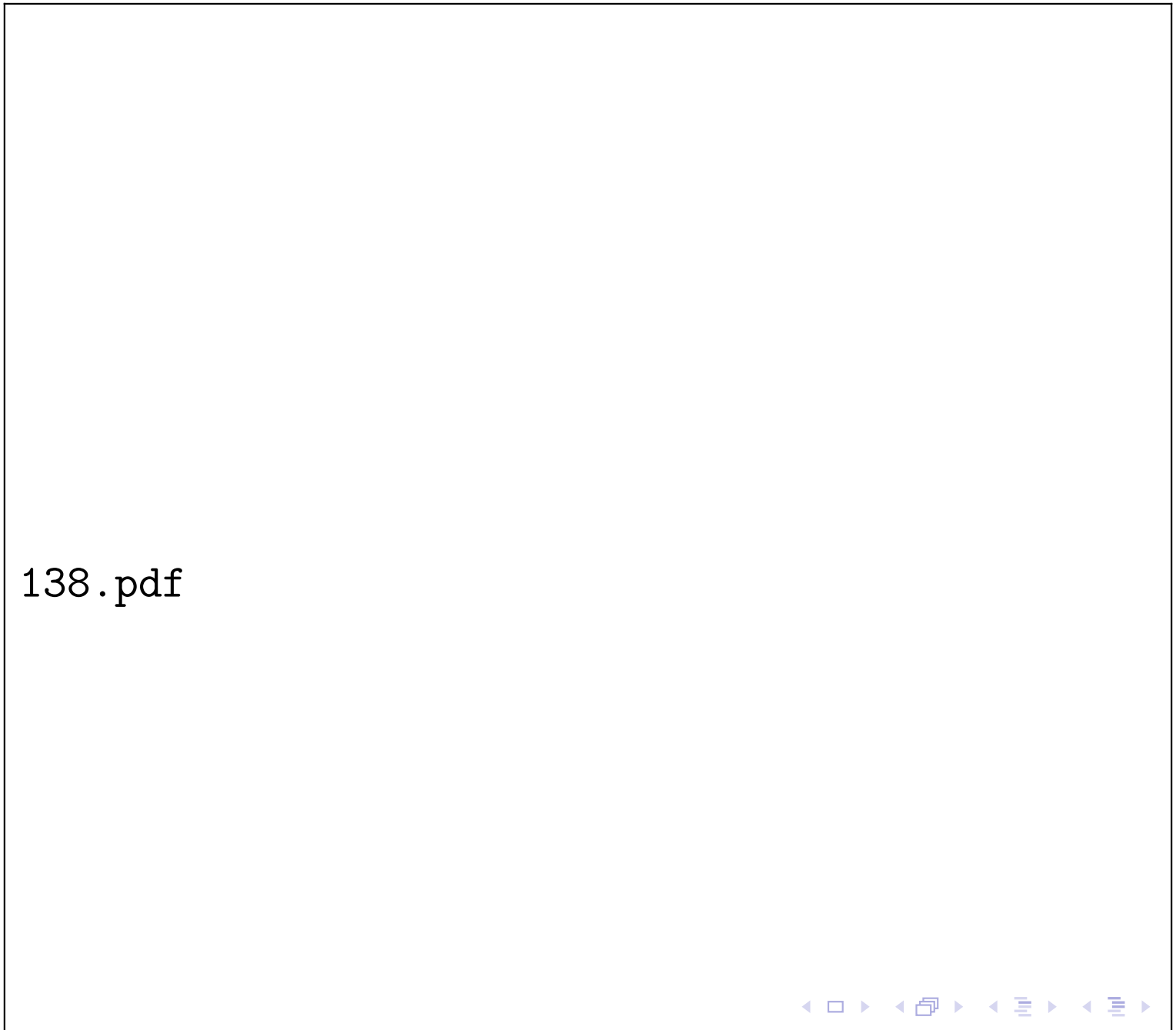
The effects of changing interest rates:

- an increase in the interest rate paid on deposits denominated in a particular currency will increase the rate of return on those deposits.
- this leads to an appreciation of the currency.

Fig. 13-5: Effect of a Rise in the Dollar Interest Rate



The Effect of an Expected Appreciation of the Euro



Suggested Articles

Barro, R.

The Ricardian approach to budget deficits,

The Journal of Economic Perspectives 3 (2)., 1989

Burda, M.C., Severgnini, B.

Solow Residuals without Capital Stocks,

Journal of Development Economics, 2014

Giavazzi, F., Pagano, M.

Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience

Swedish Economic Policy Review, 3, 67-103, 1996