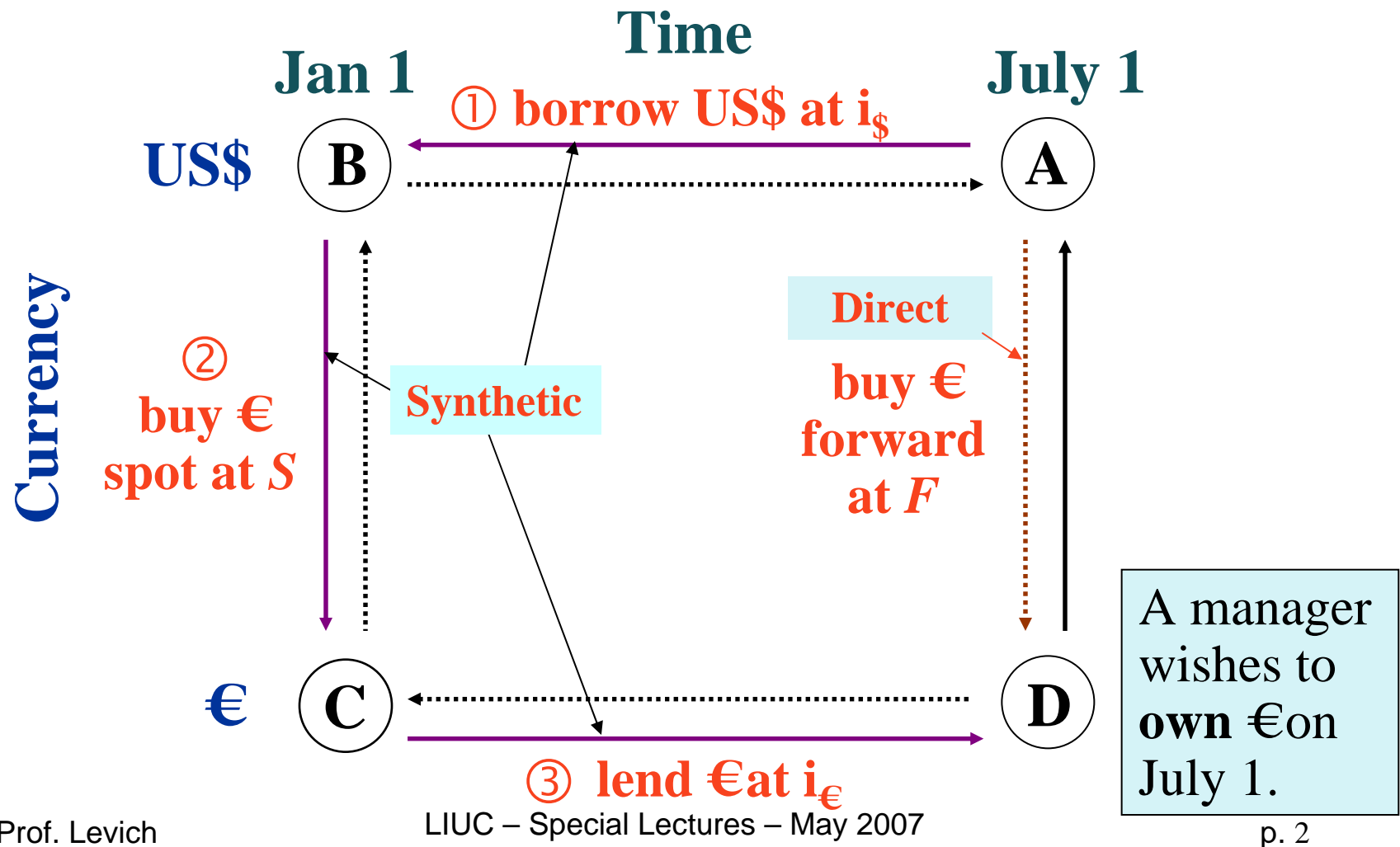


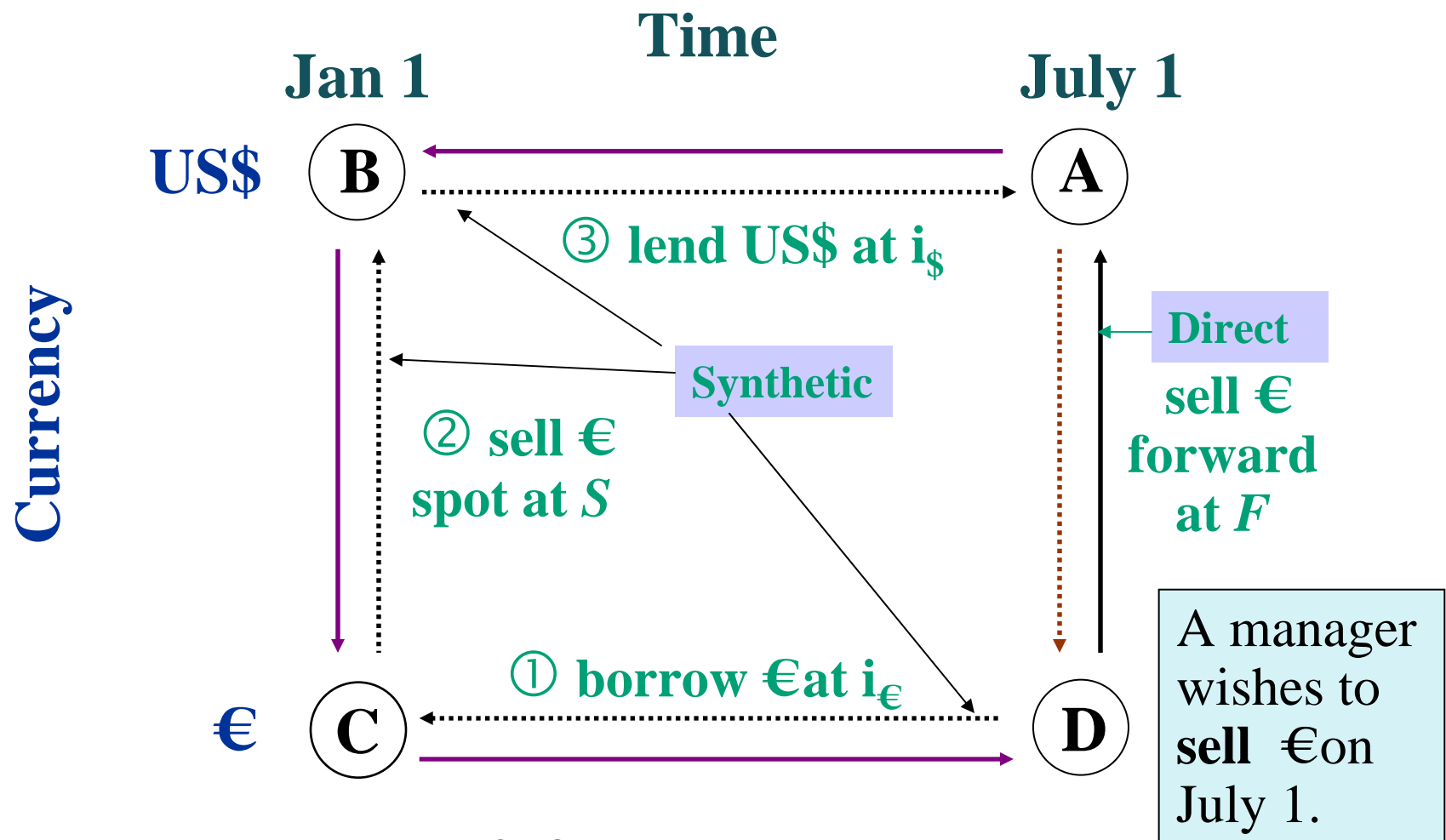
Chapter 3 – FX Market Structure and Institutions

- **The Relationship Between Spot Rates, Forward Rates, and Money Market Interest Rates**
- **Pricing a Forward Contract**
- **Pricing Other Synthetic Securities**
- **An Example of Synthetic AUD Commercial Paper**

The Relationship between Spot, Forward & Money Market Rates



The Relationship between Spot, Forward & Money Market Rates



A manager wishes to sell € on July 1.

Pricing a Forward Contract

- In the absence of transaction costs, taxes, or default, the price of the two alternatives must be identical:

The diagram illustrates the pricing of a forward contract. The central equation is $F_{t,6} = S_t \frac{(1 + i_{\$,6}/2)}{(1 + i_{\text{€}6}/2)}$. Each term in the equation is linked to a descriptive callout box:

- $F_{t,6}$ (green box): The price of 1 € for delivery on July 1.
- S_t (yellow box): The US\$ cost of each €.
- $(1 + i_{\$,6}/2)$ (purple box): The cost of each borrowed US\$.
- $(1 + i_{\text{€}6}/2)$ (light blue box): The present value of 1 €.

Synthetic Securities

- *Synthetic forwards* can be created by using a spot contract combined with borrowing and lending.

$$F = S \frac{(1 + i_{\$})}{(1 + i_{AUD})}$$

- Interpret the = sign as a “formula”, or a “recipe” with a list of “ingredients.”

Pricing a Long-Term Forward Contract

- By combining a spot contract with fixed-rate, n -period borrowing and lending in the two currencies, an n -period forward exchange contract can be constructed.

$$F_{t,n} = S_t \frac{(1 + i_{\$})^n}{(1 + i_{AUD})^n}$$

- Note that other factors may influence actual long-term forward rates.

Synthetic Securities

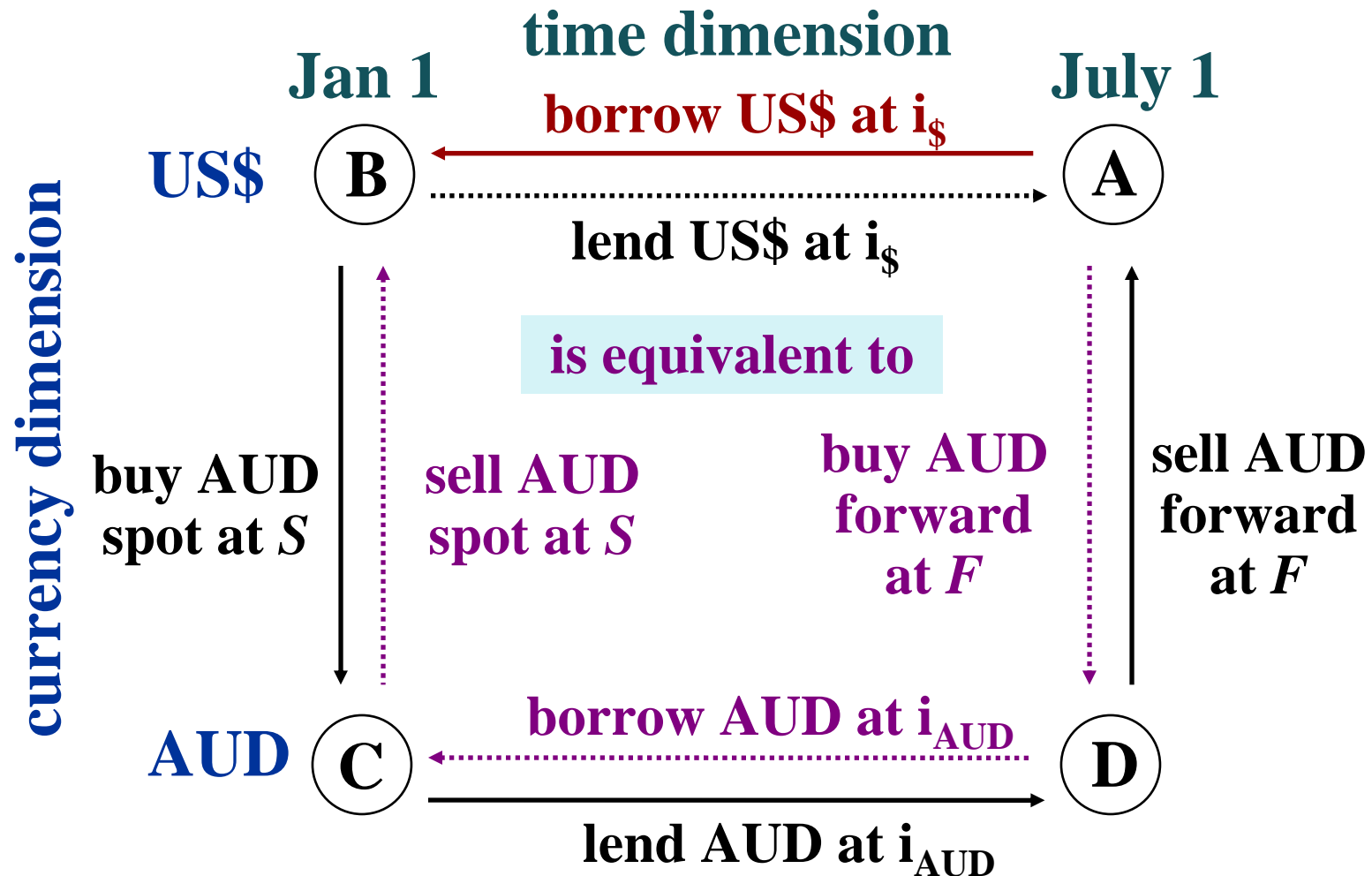
- *Synthetic securities* (whether an asset or a liability) can be constructed by combining a security denominated in the other currency with a forward contract of similar maturity and a spot contract.
- Examples
 - Swap-Driven US\$ Security
 - Synthetic AUD Security

Swap-Driven US\$ Security

$$(1+i_{\$}) = \frac{F}{S} (1+i_{AUD})$$

- Create a US\$ denominated security, by taking a AUD denominated security and combining it with a forward-spot swap

Construction of a Synthetic Dollar Security



Synthetic AUD Security

$$(1+i_{AUD}) = \frac{S}{F} (1+i_{\$})$$

- Create a AUD denominated security, by taking a US\$ denominated security and combining it with a forward-spot swap
- Why go to the trouble of doing this?

Example of Synthetic AUD Commercial Paper

ASSETS	LIABILITIES
(1) Receive \$ Cash <i>\$100,000,000</i>	A/P Issue \$ C.P. 180 day maturity <i>\$100,000,000 at 5% p.a.</i>
(2) Spot transaction@ \$0.60/AUD - \$ 100,000,000 + AUD 166,666,667	
(3) Forward contract A/R Buy \$, 180 day delivery @ \$0.606/AUD \$102,500.00	Forward contract A/P Sell AUD, 180 day delivery AUD 169,141,914

Implied Cost: $AUD\ 169,141,914 / AUD\ 166,666,667 = 1.01485 \Rightarrow 2.97\% \text{ p.a.}$

General Lessons

- Interest rate parity formula
 - Traditionally, used to understand the direction of capital movements (toward the currency with higher covered yield)
 - Now used to show
 - How to price
 - How to build or replicate
 - How to hedgea financial contract or financial position