国际财务管理

第五讲 外汇风险管理

对外经济贸易大学国际商学院会计学系制作

Foreign Exchange Risk Management

Risk

The future is unknown actual outcomes can deviate from expected outcome

Exposure

The value of its assets or liabilities can change with unexpected change in currency value.

How much is at risk

Foreign Exchange Risk Management

Market Value Balance Sheet

Monetary assets + Real assets = Monetary liabilities + Owner's Equity

- Monetary assets:

  Cash, Money market securities, A/R, Deposits (domestic and foreign currency), Cash inflow (forwards, futures, options ,swap contracts)

- Money liabilities:

  Wages, A/P, Debts (domestic and foreign currency), Cash outflow (forwards, futures, options ,swap contracts)

- Real assets:

  Productive technologies, Capacities (manufacturing), Human assets (service firm), Inventory

Type of Foreign Exchange Exposure

- **Operating Exposure (**also called *economic exposure*, *competitive exposure*, or *strategic exposure***)**

  Potential change in the Value of noncontractual future cash flow (i.e. non-monetary, or real assets and liability) due to unexpected change in exchange rates.

- **Transaction Exposure**

  Potential change in the Value of contractual future cash flow (i.e. monetary and liability) due to unexpected change in exchange rates.

- **Accounting Exposure (Translation Exposure)**

  Potential change in financial accounting statements due to change in exchange rates.

Exhibit 1 Conceptual Comparison of Transaction, Operating and Accounting Foreign Exchange Exposure

Moment in time when exchange rate changes

Accounting exposure

Changes in reported owners' equity in consolidated financial statements caused by a change in exchange rates

Operating exposure

Change in expected future cash flows arising from an unexpected change in exchange rates

Transaction exposure

Impact of settling outstanding obligations entered into before change in exchange rates but to be settled after change in exchange rates

Time

Measuring the Impact of Operating Exposure

US$ Reporting Environment

美国母公司

Will the altered profits of the Italian subsidiary, in euro, translate into more or less in US dollars?

US$/€

Euro Competitive Environment

意大利子公司

How will the sales, costs, and profits of the Italian subsidiary change?

Subsidiary’s Suppliers

Will costs change?

Subsidiary’s Customers

Will prices and sales volume change? How much?

An unexpected depreciation in the value of the euro alters both the competitiveness of the subsidiary and the financial results which are consolidated with the parent company.

Managing Operating Exposure

- The objective of operating exposure management is to anticipate and influence the effect of unexpected changes in exchange rates on a firm’s future cash flows, rather than merely hoping for the best.
- To meet this objective, management can *diversify* the firm’s operating and financing base.
- Management can also change the firm’s operating and financing policies.
- A diversification strategy does not require management to predict disequilibrium, only to recognize it when it occurs.

Managing Operating Exposure

- 对于经营风险管理，主要针对多元化经营、多元化融资来分散或减少经营风险。
- 案例分析：以原西德**Volkswagen**公司（简称**VW**）的经历为例所明。

VW公司实例说明：

- 如果经营风险是由<u>本国货币升值</u>造成的，公司的主要对策当是尽可能地使成本变为贬值货币：**1)**把向贬值国家的出口活动转变为在贬值国家生产或购买；**2)**在借入资本中，增大贬值货币借入的比例。
- 如果经营风险是由<u>本国货币贬值</u>造成的，公司应采取的对策正好相反，即主要把在升值国家的生产活动转变为本国的对外出口活动。

Managing Transaction Exposure

- Transaction exposure measures gains or losses that arise from the settlement of existing financial obligations whose terms are stated in a foreign currency.
- The most common example of transaction exposure arises when a firm has a receivable or payable denominated in a foreign currency.

Exhibit 3 The Life Span of a Transaction Exposure

Time and Events

t_1

Seller quotes a price to buyer (in verbal or written form)

t_2

Buyer places firm order with seller at price offered at time t_1

t_3

Seller ships product and bills buyer (becomes A/R)

t_4

Buyer settles A/R with cash in amount of currency quoted at time t_1

Quotation Exposure

Time between quoting a price and reaching a contractual sale

Backlog Exposure

Time it takes to fill the order after contract is signed

Billing Exposure

Time it takes to get paid in cash after A/R is issued

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Measurement of Transaction Exposure

- Foreign exchange transaction exposure can be managed by *contractual*, *operating*, and *financial hedges*.
- The main contractual hedges employ the forward, money, futures, and options markets.
- Operating and financial hedges employ the use of risk-sharing agreements, leads and lags in payment terms, swaps, and other strategies.

通用电气的交易风险管理

美国通用电气公司在**1**月份向英国航空公司出售涡轮机螺旋桨，价值**1,000,000**英镑。该公司的资本成本为**12%**，有关报价如下：

S (t)= $1.7640/￡

F1/4 = **$1.7540/**￡ **(**三个月远期汇率表明英镑年贴水**2.2676%)**

I u k贷=**10% p. a . I u k**投**= 8.0% p .a .**

I us贷=**8.0% p .a . I us**投**= 6.0% p.a.**

1) 在费城股票交易所，**6**月份到期的英镑看跌期权：合约金额：**£31,250**，协定价格**S=$1.75/£**，期权费**P=$0.025/£**，佣金为每 份合约**$50**。

2)在场外（**OTC**）交易，**6**月份到期的英镑看跌期权：合约金额 **£1,000,000**，协定价格**S=$1.75/£**，期权费**1.5%**。

另外通用公司预测**3**个月后的即期价格为**$1.76/£**，因此公司有以下四种方案可供该公司选择：

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通用电气的交易风险

- Contractual Techniques
  - Unhedged Position
  - Forward Market Hedge
  - Money Market Hedge
  - Option Market Hedge
- These choices apply to an account receivable and/or an account payable

通用电气的交易风险(Option Market Hedge)

每份期权的价格（$0.025×￡31,250）	$781.25
每份期权的佣金	50
每份期权成本	$831.25
所需合约数（￡1,000,000/￡31,250）	32
期权合约的总成本（ 32× $831.25）	$26,600

每英镑的期权成本= $831.25/￡31,250=$0.0266

场外交易的期权成本为：

￡1,000,000×0.015×$1.7640=$26,460

考虑6个月后的成本为

$$\$26{,}460(1+\frac{6}{12}\times 12\%)=\$28{,}047.6$$

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通用电气的交易风险(Other Hedging)

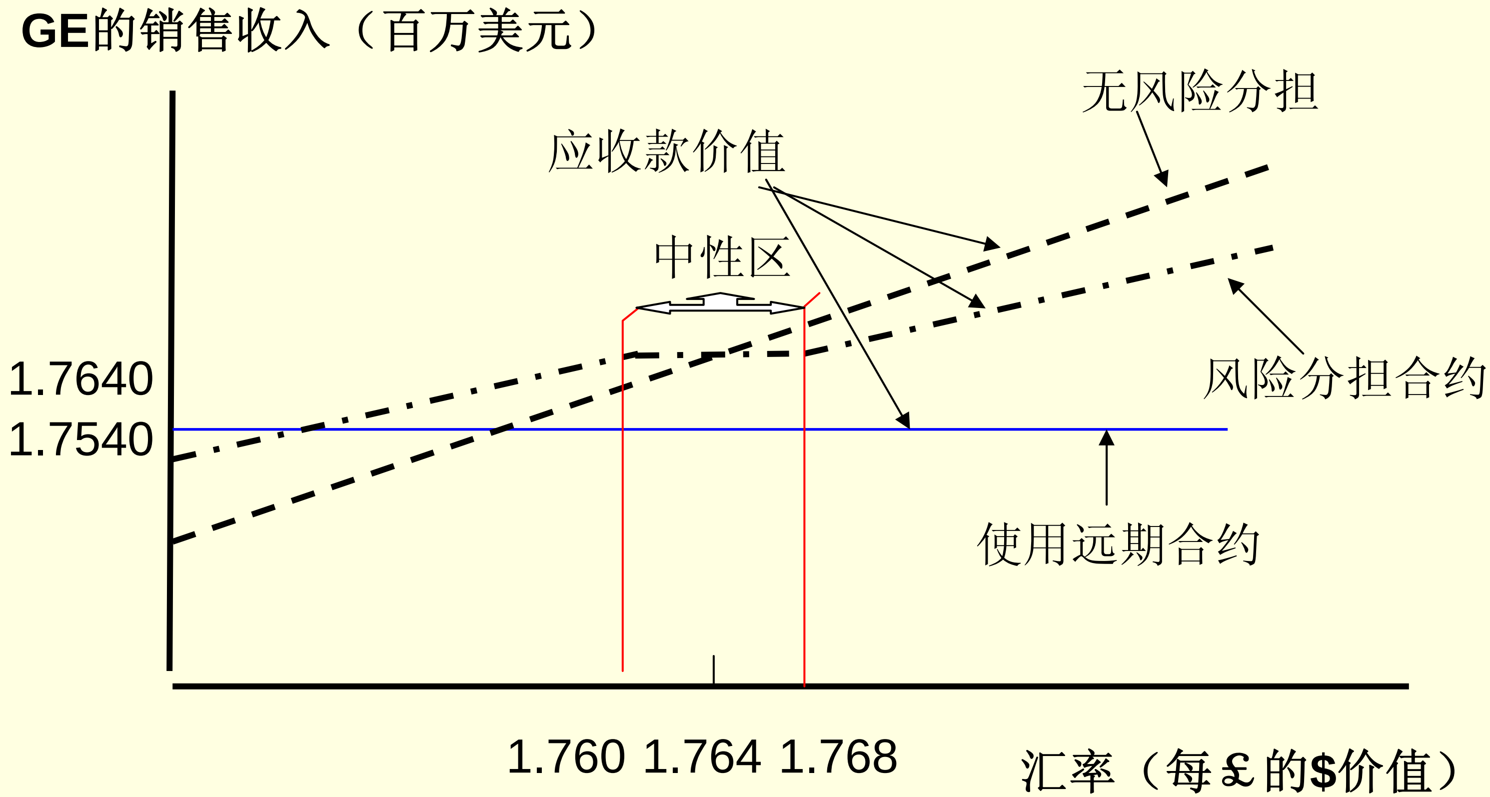
- Risk Shifting

$$P_{\$} / 1.7540 = £1,000,000$$

or $$P_{\$} = \$1,754,000$$

通用电气的交易风险(Other Hedging)

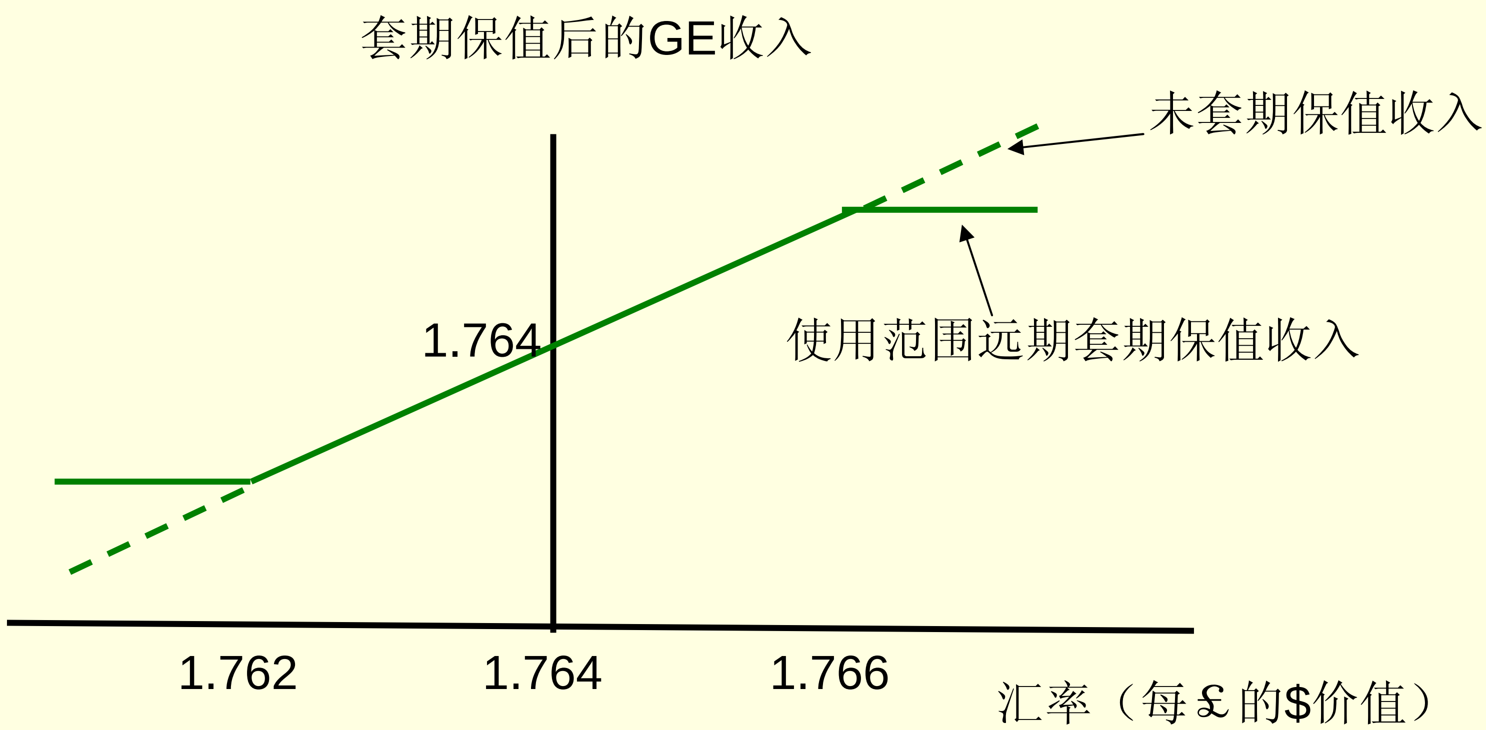
Currency Risk Sharing



通用电气的交易风险(Other Hedging)

Currency Collars

基本思想：确定一个汇率波动的上下限



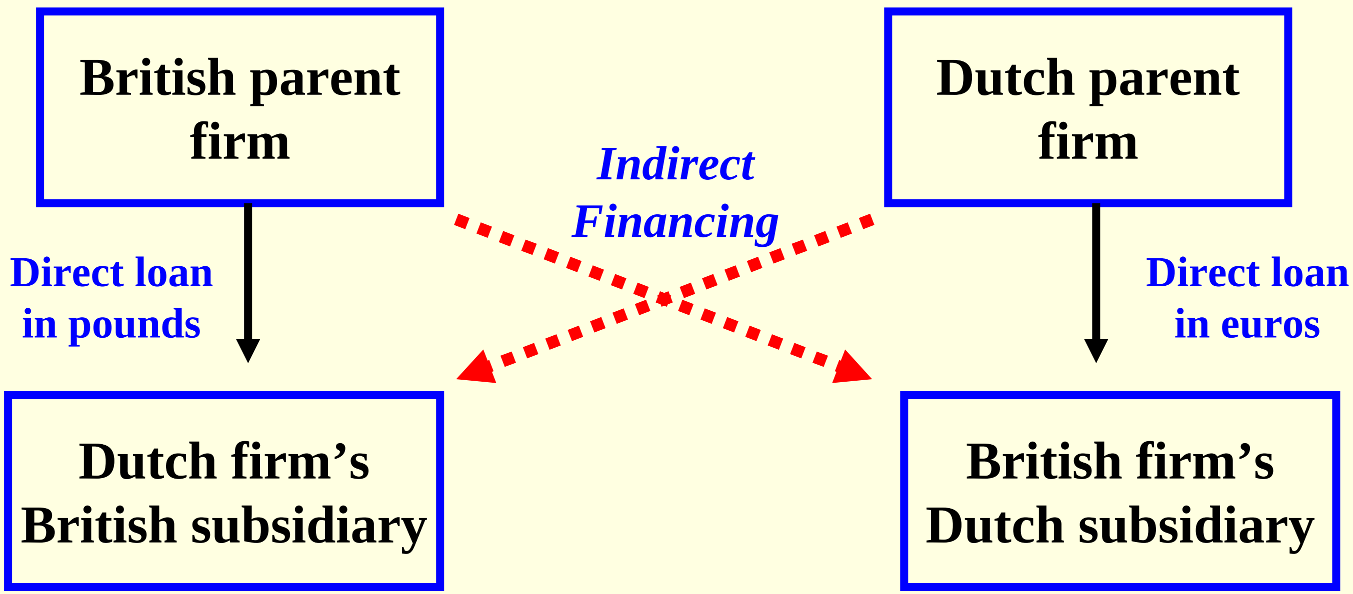
Swap Agreements

- Back-to-Back Loans:
  - A *back-to-back loan*, also referred to as a *parallel loan* or *credit swap*, occurs when two business firms in separate countries arrange to borrow each other's currency for a specific period of time.
  - At an agreed terminal date they return the borrowed currencies.
  - Such a swap creates a covered hedge against exchange loss, since each company, on its own books, borrows the same currency it repays.

Exhibit 4 Using a Back-to-Back Loan for Currency Hedging

1. British firm wishes to invest funds in its Dutch subsidiary

2. British firm identifies a Dutch firm wishing to invest funds in its British subsidiary



3. British firm loans British pounds directly to the Dutch firm's British subsidiary

4. British firm's Dutch subsidiary loans euros from the Dutch parent

The back-to-back loan provides a method for parent-subsidiary cross-border financing without incurring direct currency exposure.

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Swap Agreements

- ***parallel loan***

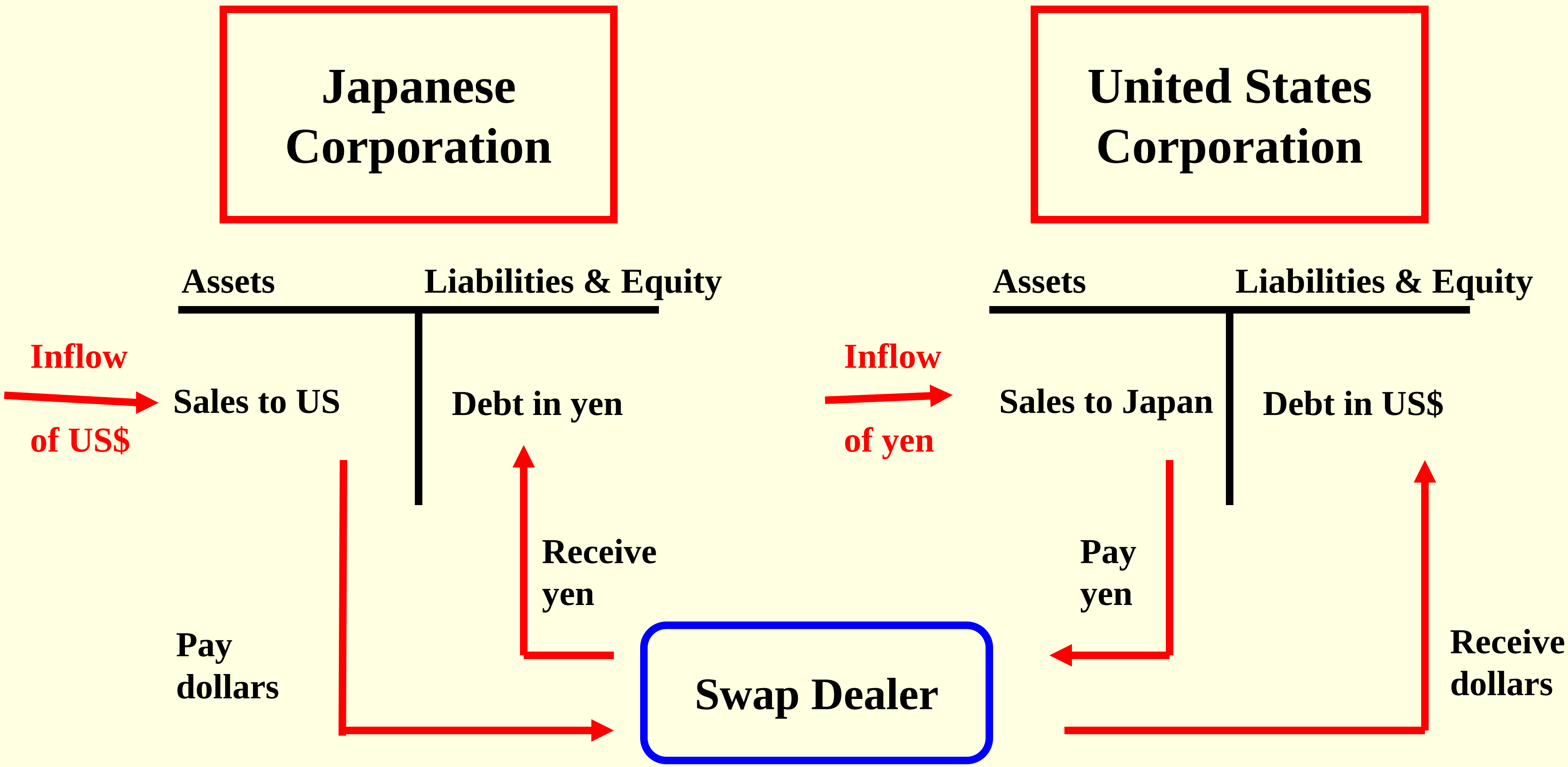
在美国	在巴西
法国母公司	美国的子公司
│$	│**Cr** $
↓	↓
美国母公司	法国的子公司

Swap Agreements

- *Swaps* are contractual agreements to exchange or swap a series of cash flows.
- These cash flows are most commonly the interest payments associated with debt service, such as the floating-rate loan described earlier.
  - If the agreement is for one party to swap its fixed interest rate payments for the floating interest rate payments of another, it is termed an *interest rate swap*
  - If the agreement is to swap currencies of debt service obligation, it is termed a *currency swap*
  - A single swap may combine elements of both interest rate and currency swaps

Exhibit 6 Using a Cross Currency Swap to Hedge Currency Exposure

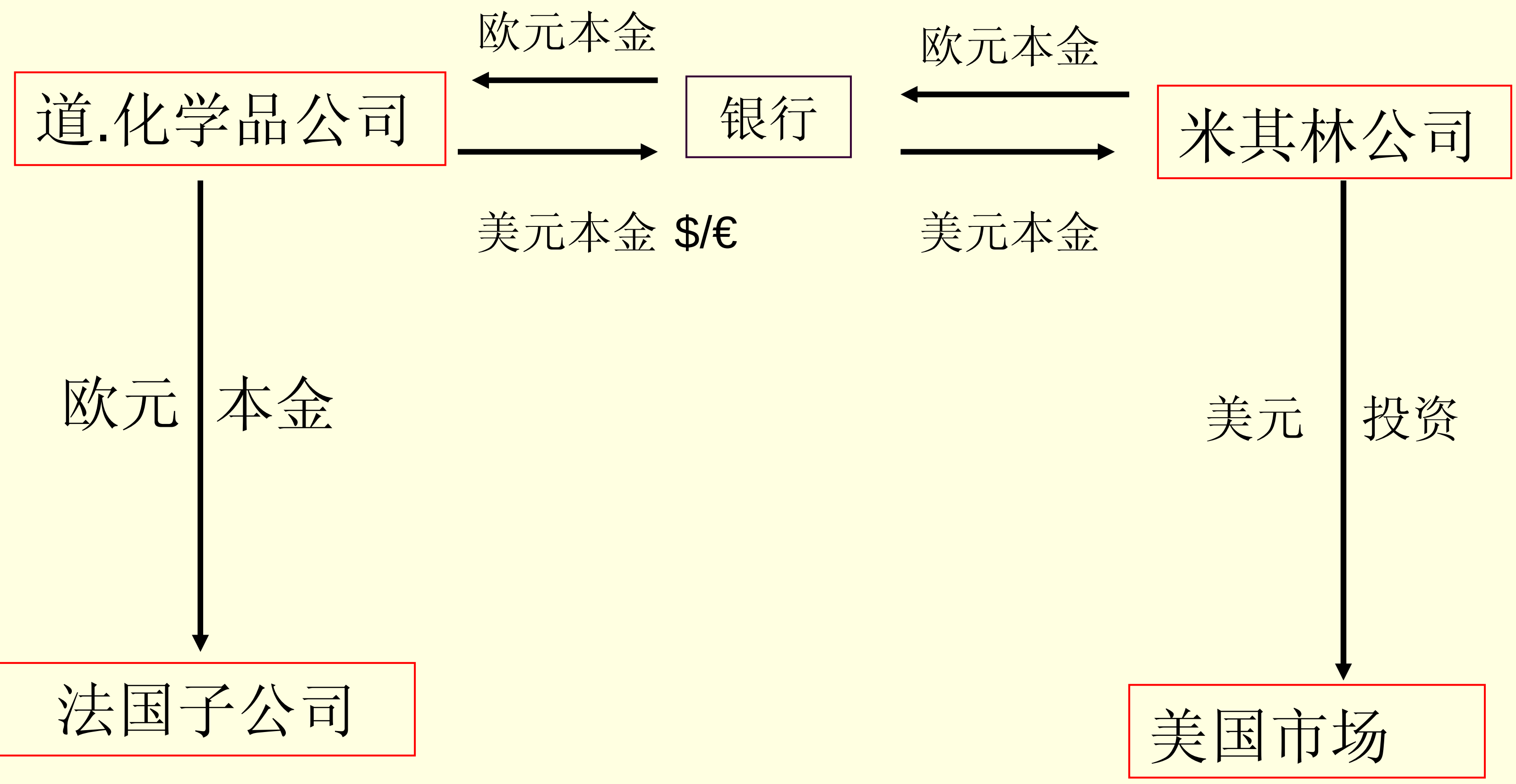
Both the Japanese corporation and the U.S. corporation would like to enter into a cross currency swap which would allow them to use foreign currency cash inflows to service debt.



Wishes to enter into a swap to “pay dollars” and “receive yen”

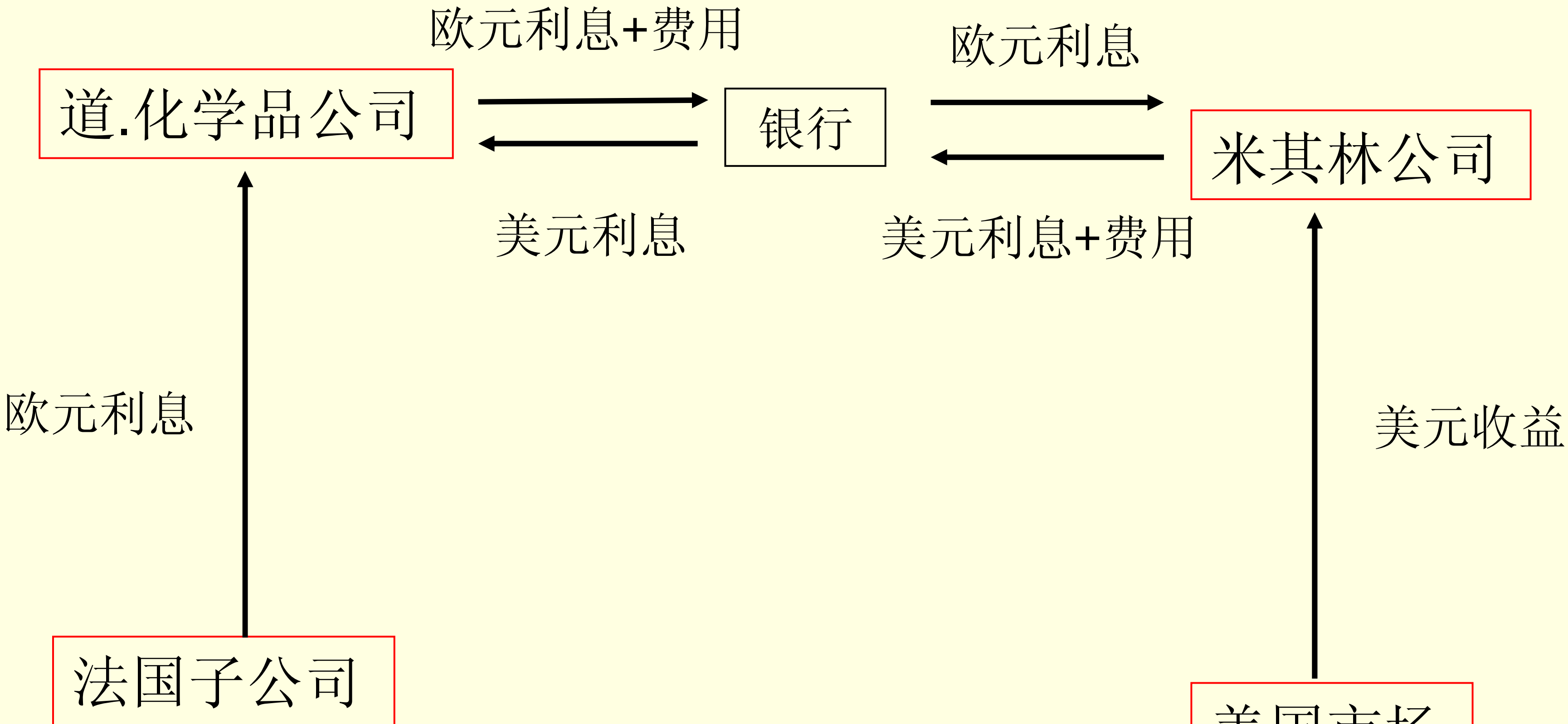
Wishes to enter into a swap to “pay yen” and “receive dollars”

第一步交易开始：



本金初期互换

第二步：各方进行利息互换



利息互换

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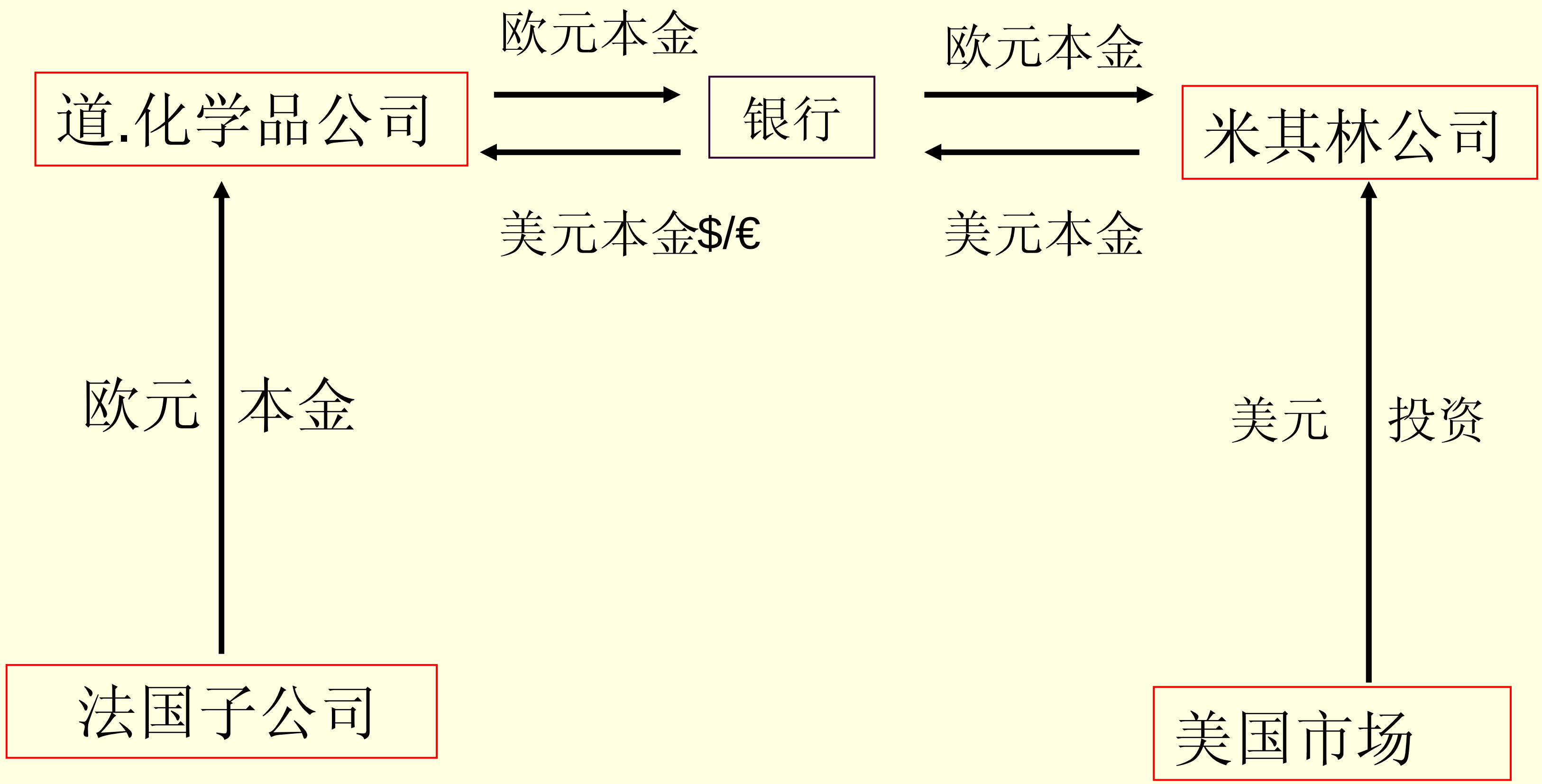
第三步：各方进行到期本金互换



到期本金互换

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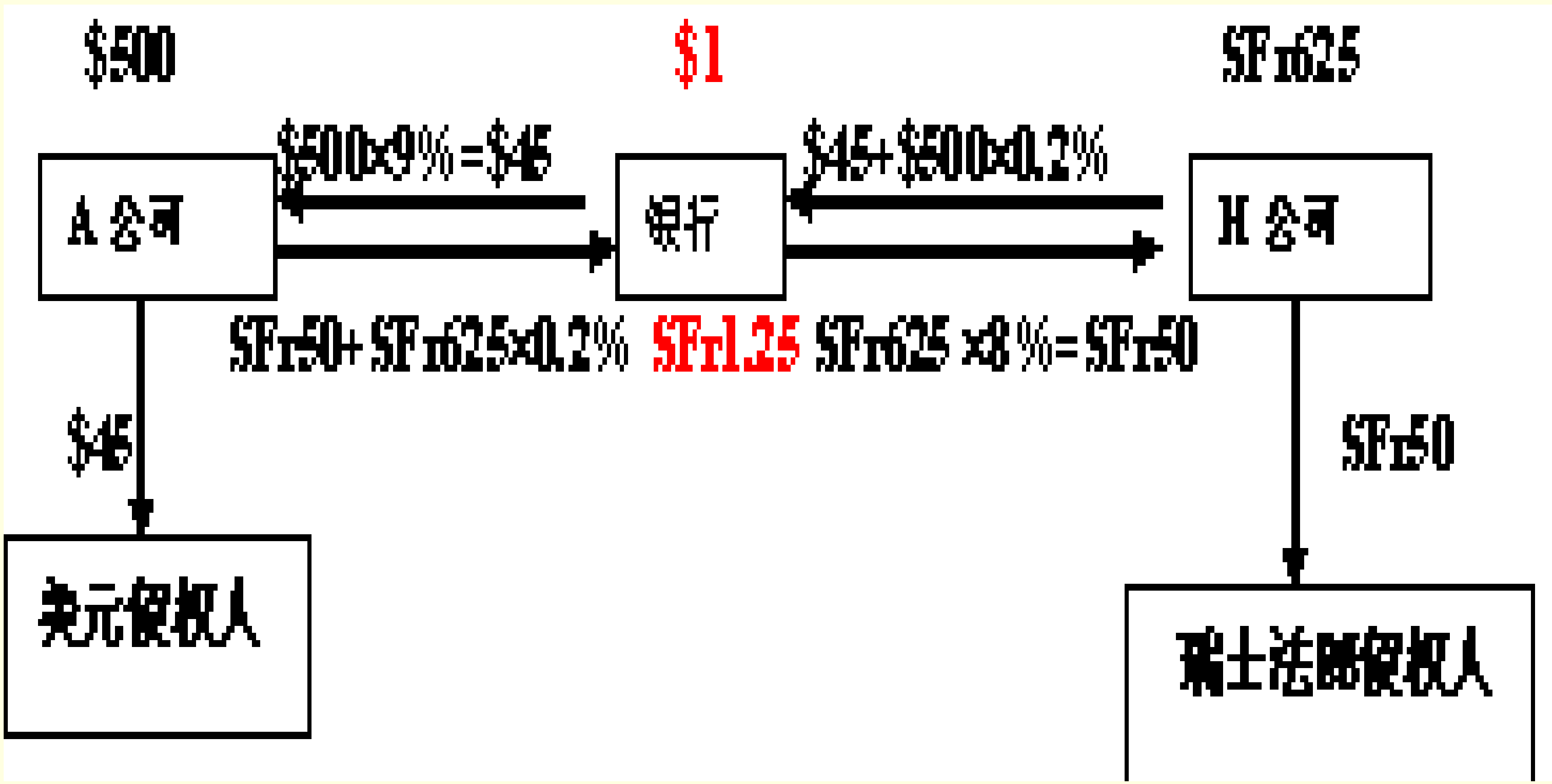
案例分析

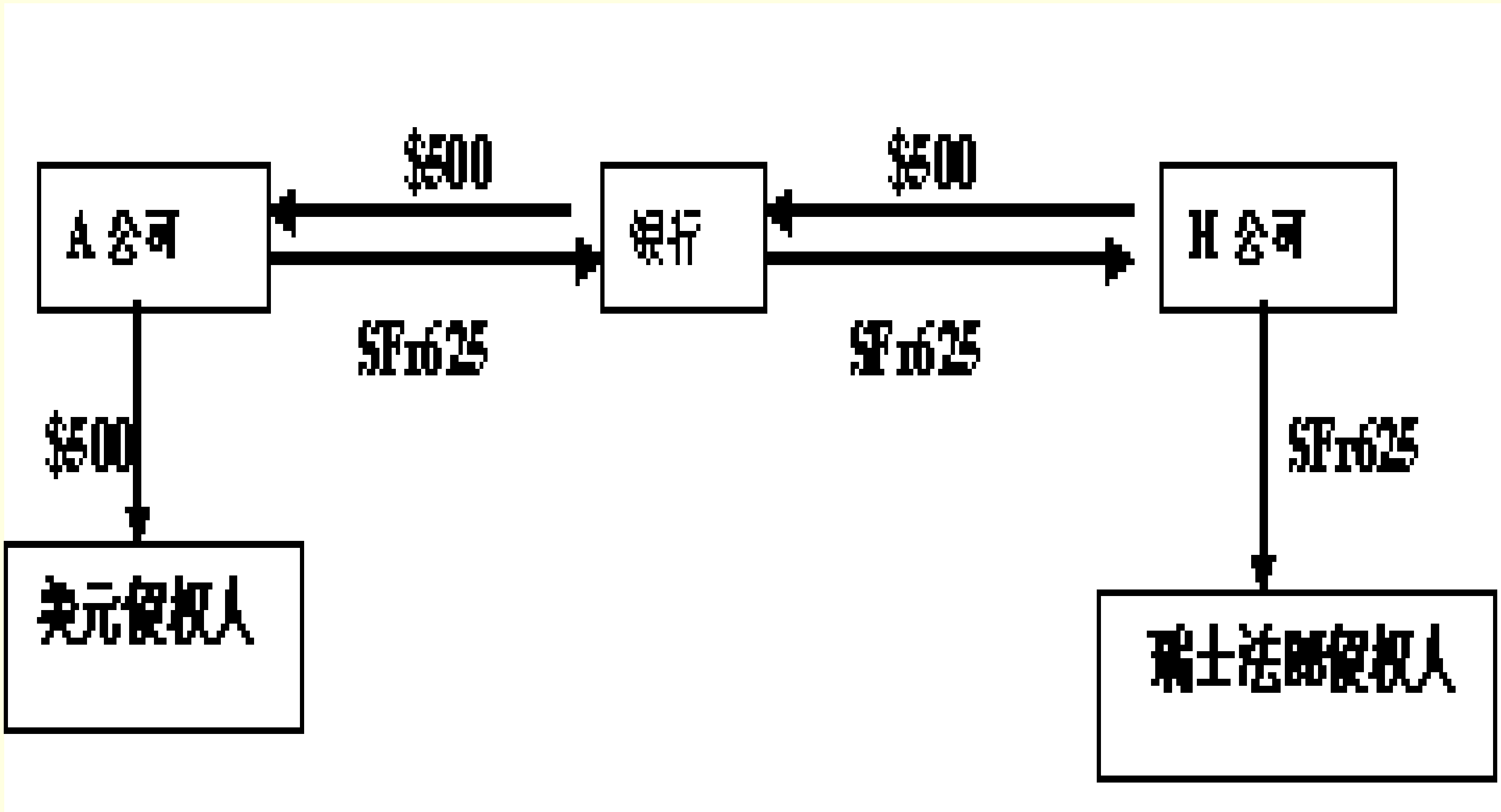
- 爱华公司在两年前发行了价值**$500**万的债券，期限为**7**年，息票率为**9%**，当前的美元对瑞士法郎的汇率为**SFr1.6/$**，因此，这笔债务的账面价值为**SFr800**万。现在距偿还日还剩**5**年。同时海奇公司现有**5**年的瑞士法郎债务**SFr1000**万，息票率为**8%**。现在双方都希望通过货币互换来改变资金的负债结构。由于这两项债务都是过去发生的，因此，在互换期初不交换本金，也不考虑原来发行债券的费用。
- 假设现在的汇率**SFr1.25/$**

案例分析



$500
$1
SFr625
$500x9%=$45
$45+$500x0.2%
A公司
银行
H公司
SFr50+SFr625x0.2%
SFr1.25
SFr625 x8%=SFr50
$45
SFr50
美元债权人
瑞士法郎债权人

案例分析



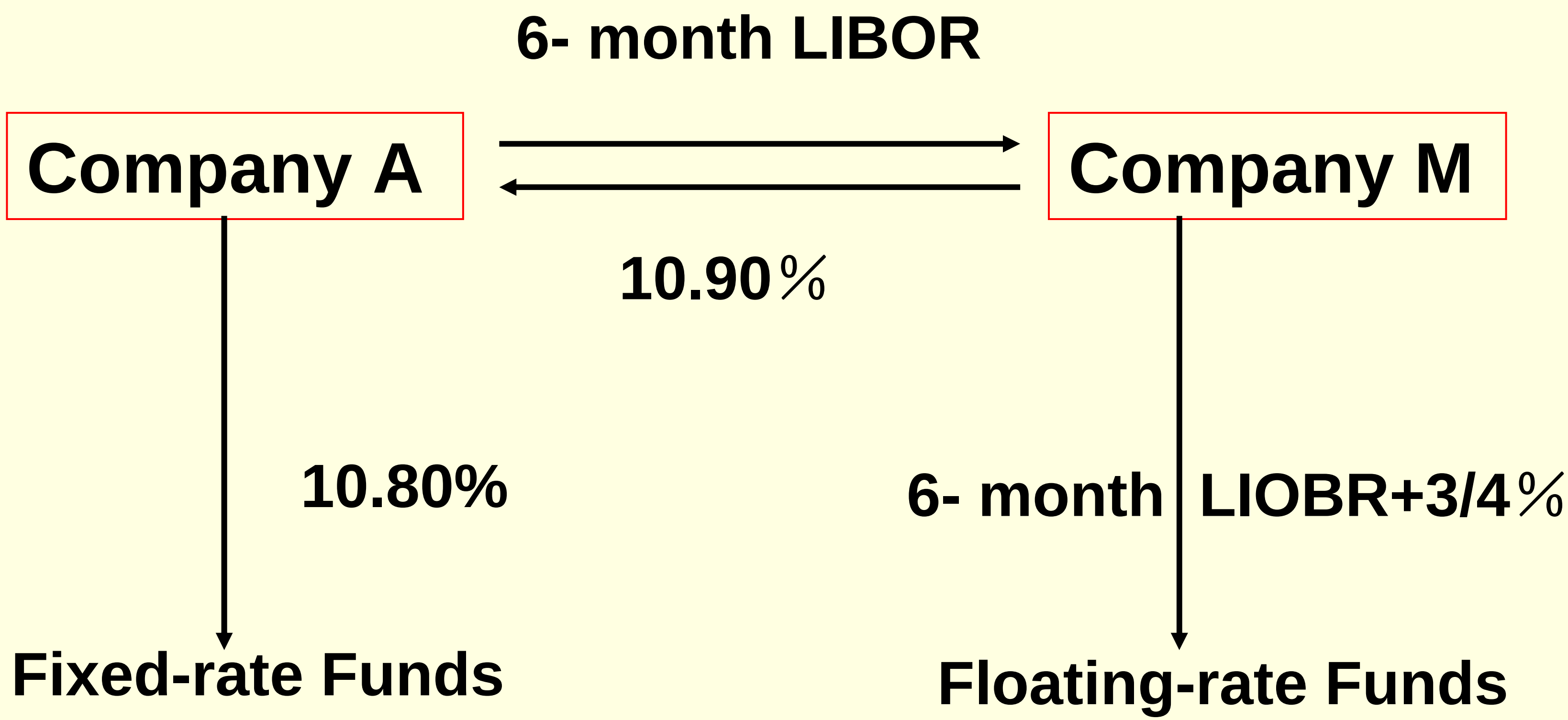
Interest Rate Swap

- 利率互换是指同种货币不同计息方法利息的互换。利率互换交易的基本做法是：持有同种货币的交易双方，以商定的筹资本金为计算利息的基础，一方以其筹措的固定利率资金换取另一方的浮动利率资金。
- 利率互换的两种主要类型为息票互换和基点互换。

Interest Rate Swap

	Company A	Company M	Difference
Credit Quality	**AAA**	**BBB**	
Fixed-rate	**10.80%**	**12.00%**	**1.20%**
Floating-rate	**LIBOR6＋1/4%**	**LIBOR6+3/4%**	**0.5%**

Interest Rate Swap



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Interest Rate Swap

- **A=-LIBOR-10.8%+10.9%**
  =-(LIBOR-0.1%)
- **M=-(LIBOR+0.75%)-10.9%+LIBOR**
  =-11.65%

	原筹资利率	互换后的筹资利率	节约利率
Company A	**LIBOR6＋1/4%**	**LIBOR-0.1%**	**0.35%**
Company M	**12.00%**	**11.65%**	**0.35%**

Operating Strategies: Leads/Lags

- Firms can reduce both operating and transaction exposure by accelerating or decelerating the timing of payments that must be made or received in foreign currencies.
- To *lead* is to pay early.
- To *lag* is to pay late.
- Leading and lagging is more feasible between related firms, because they presumably embrace a common set of goals *for the consolidated group*.
- This device is readily more applicable if the MNE operates on an integrated worldwide basis.

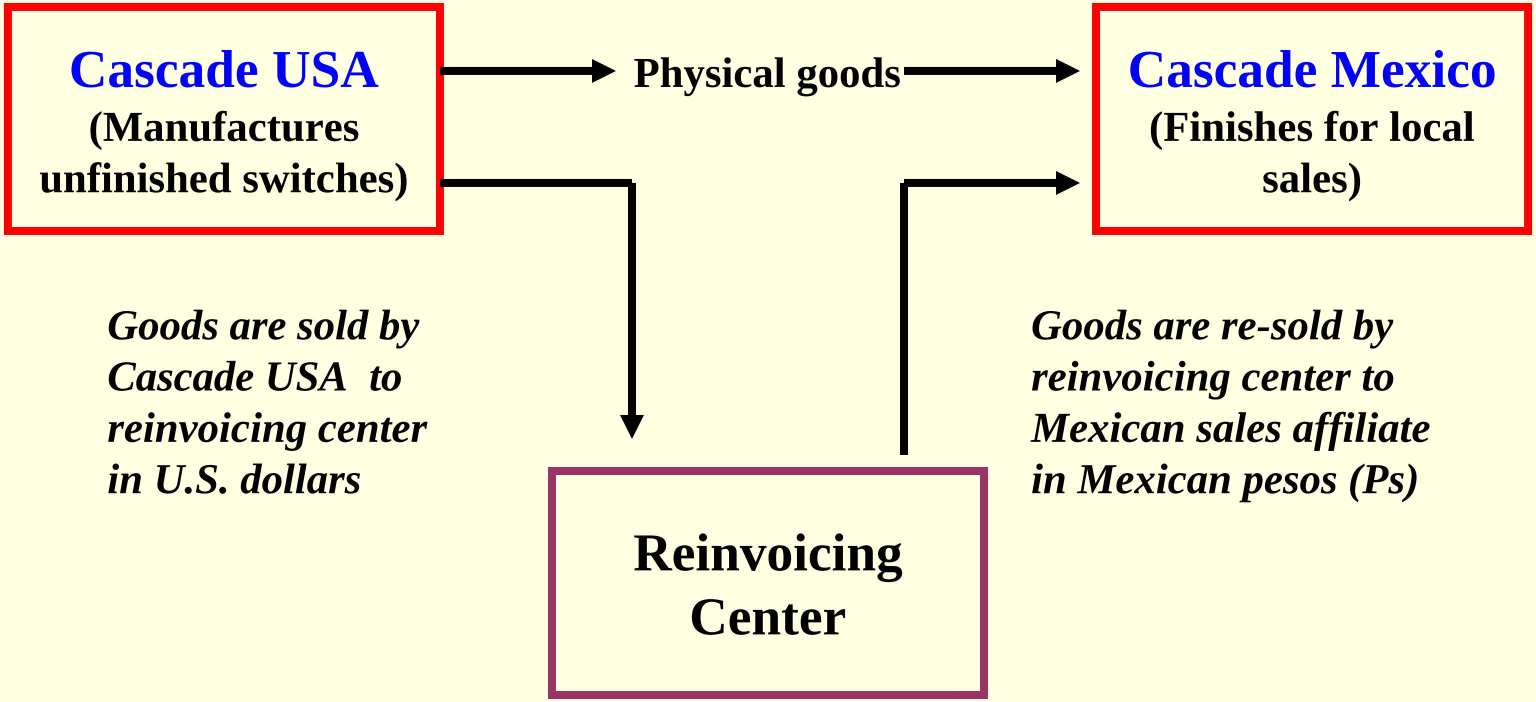
Operating Strategies: Leads/Lags

- Because the use of leads and lags is an obvious technique for minimizing foreign exchange exposure and for shifting the burden of financing, many governments impose limits on the allowed range.
- Leading or lagging between independent firms requires the time preference of one firm to be imposed to the detriment of the other firm.

Operating Strategies: Re-Invoicing Centers

- A *re-invoicing center* is a separate corporate subsidiary that serves as a type of middle-man between the parent or related unit in one location and all foreign subsidiaries in a geographic region.
- As depicted in the following exhibit, the US manufacturing unit of Cascade USA invoices the firm’s re-invoicing center – in US dollars.
- The re-invoicing center in turn resells to Cascade Mexico in Mexican pesos.
- Consequently, all operating units deal only in their own currency, and all transaction exposure lies with the re-invoicing center.

Use of a Reinvoicing Center



1. Cascade USA ships goods directly to the Mexican subsidiary.
2. The invoice by Cascade USA, which is denominated in U.S. dollars, is passed to the reinvoicing center.
3. The reinvoicing center takes legal title to the goods.
4. The reinvoicing center invoices Cascade Mexico in Mexican pesos, repositioning the currency exposure from both operating units to the reinvoicing center.

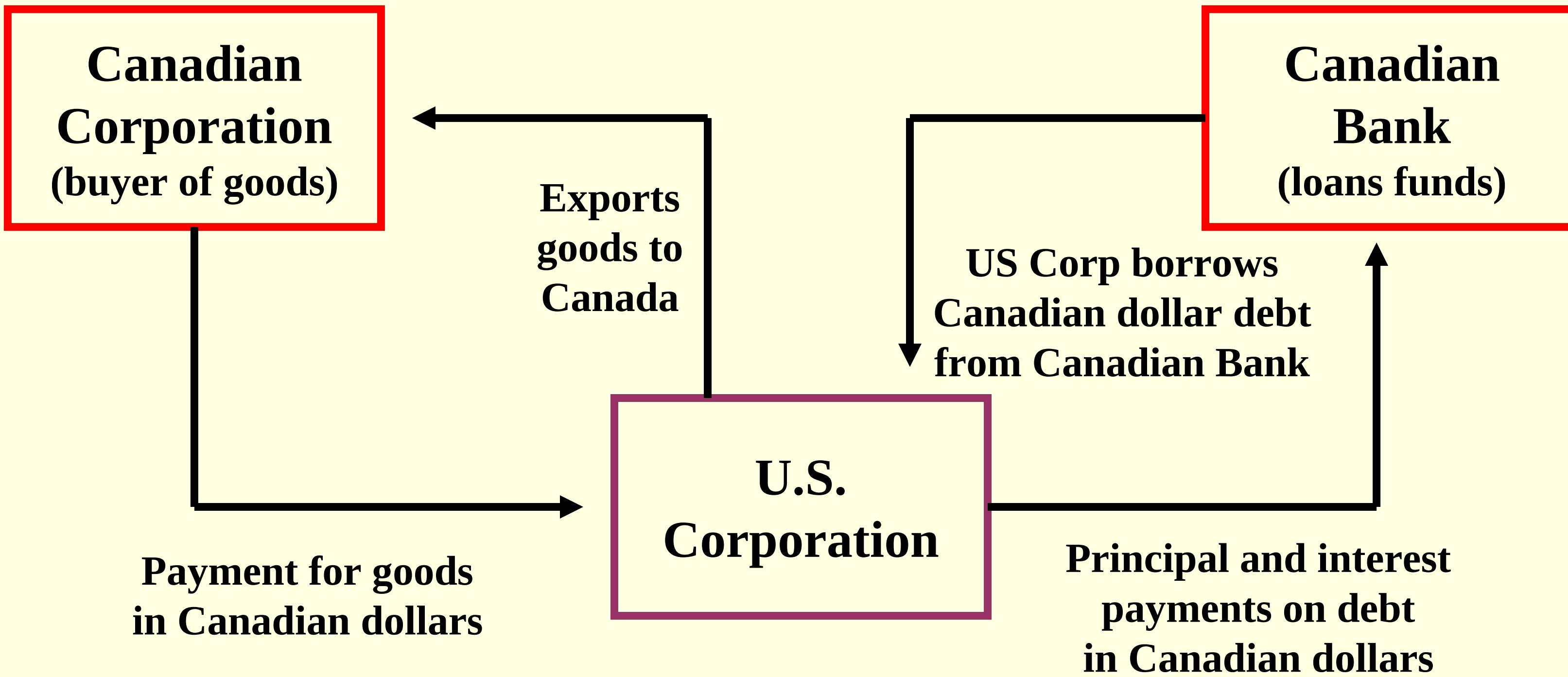
Operating Strategies: Re-Invoicing Centers

- The three main benefits of such a strategy are:
  - Managing foreign exchange exposure in one place
  - Guaranteeing the exchange rate for future orders
  - Managing intra-subsidiary cash flows
- The main disadvantage is that the benefits may not justify the agency cost (an additional corporate unit with its own set of books).
- The establishment of such a center is also likely to bring increased scrutiny by tax authorities.

Operating Strategies:
Matching currency cash flows

- For example, a US firm has continuing export sales to Canada.
- In order to compete effectively in Canadian markets, the firm invoices all export sales in Canadian dollars.
- This policy results in a continuing receipt of Canadian dollars month after month

Matching: Debt Financing as a Financial Hedge



Exposure: **The sale of goods to Canada creates a foreign currency exposure from the inflow of Canadian dollars**

Hedge: **The Canadian dollar debt payments act as a financial hedge by requiring debt service, an outflow of Canadian dollars**

Operating Strategies: Matching currency cash flows

- One way to offset an anticipated continuous long exposure to a particular company is to acquire debt denominated in that currency (*matching*).
- Another alternative would be for the US firm to seek out potential suppliers of raw materials or components in Canada as a substitute for US or other foreign firms.
- In addition, the company could engage in *currency switching*, in which the company would pay foreign suppliers with Canadian dollars.

Operating Strategies:
Selection the Invoice

a. 在对外交易中应尽力争取使用本国货币

b. 在用外汇收付中，争取付汇用软币，收汇用硬币

c. 进口、借贷资本输入争取使用自己所持有的外汇。

d. “一揽子”货币（组合货币）

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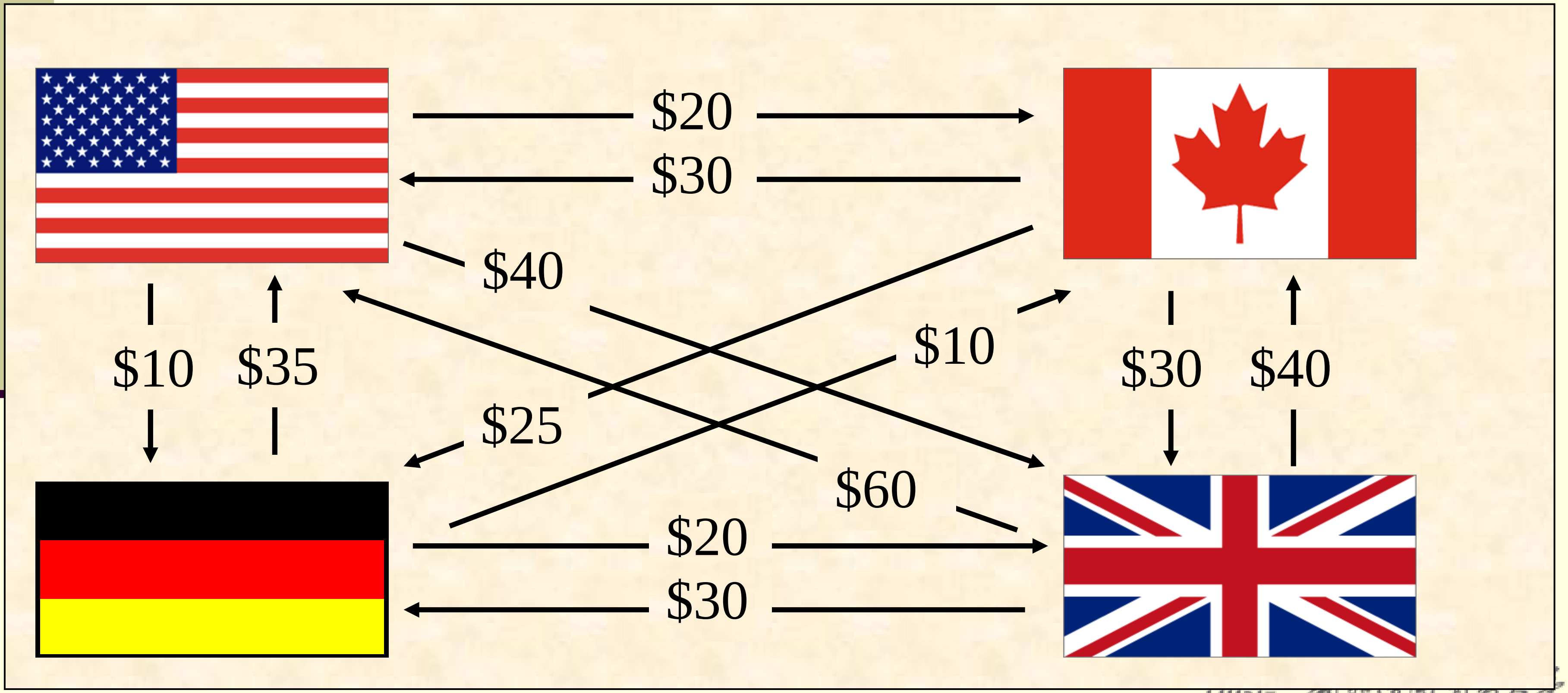
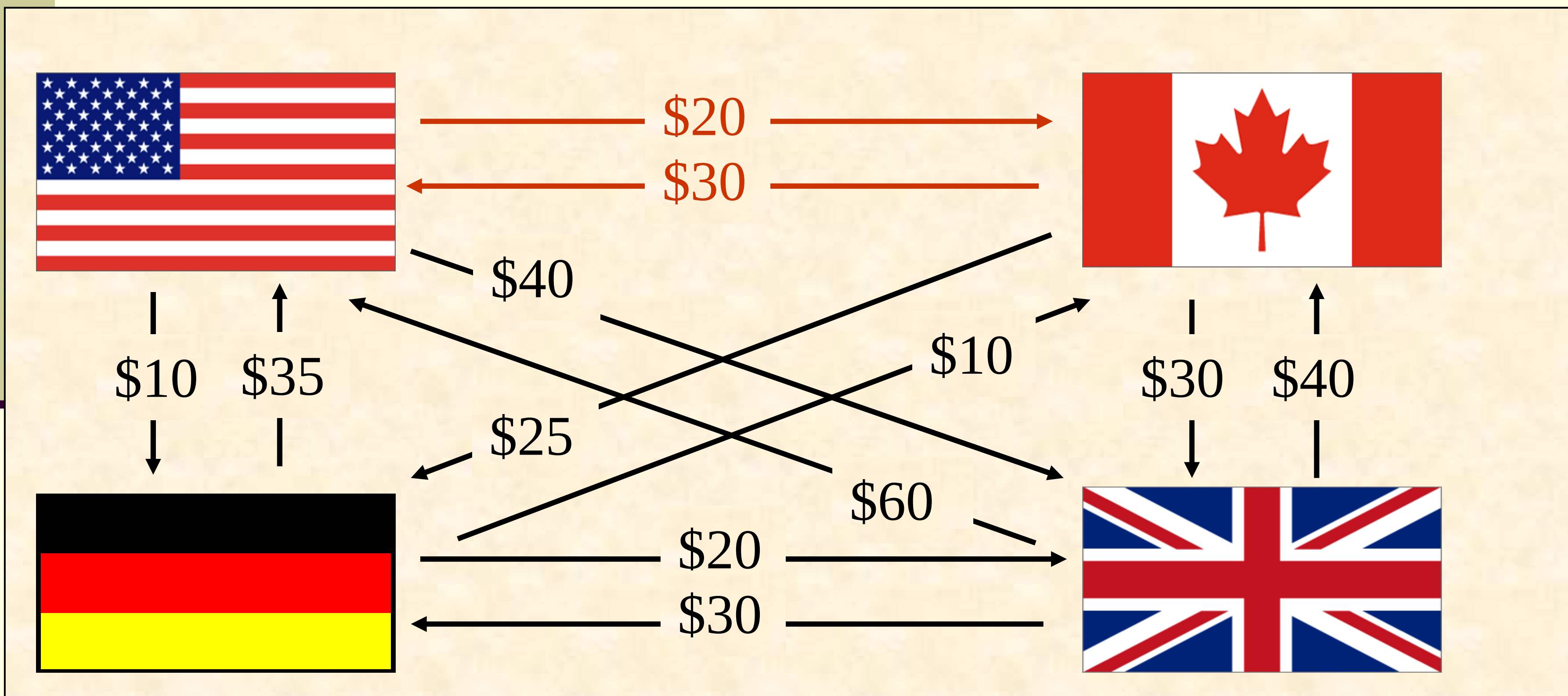
Exposure Netting: an Example

Consider a U.S. MNC with three subsidiaries and the following foreign exchange transactions:



Exposure Netting: an Example

Bilateral Netting would reduce the number of foreign exchange transactions by half:



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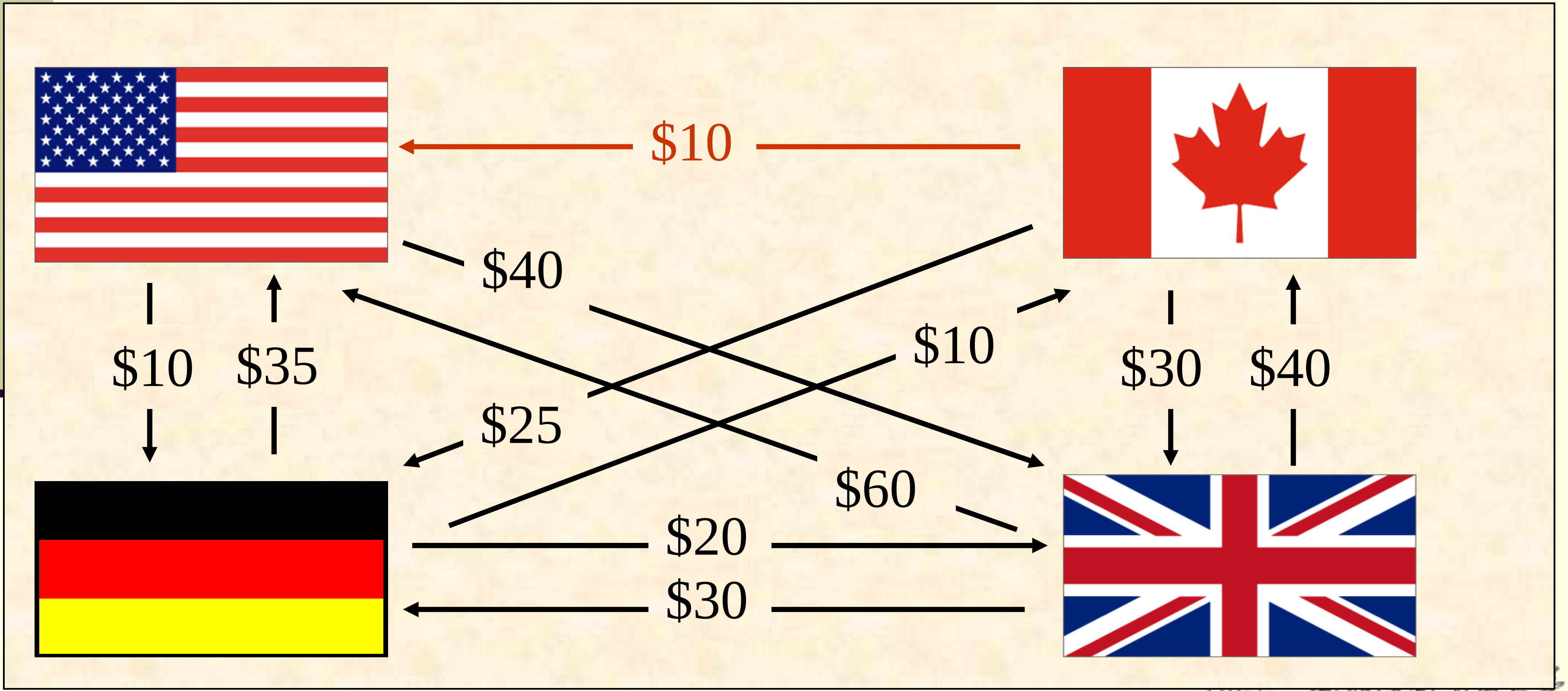

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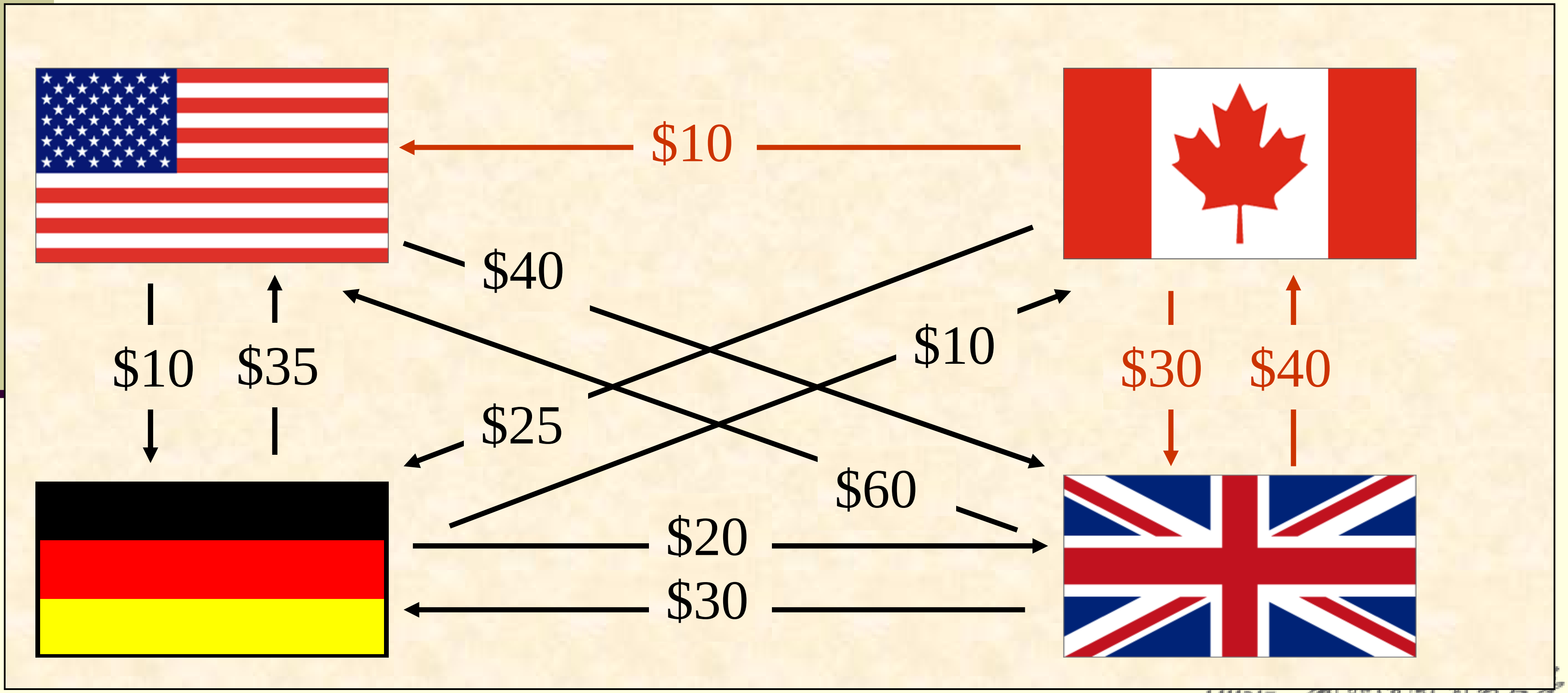

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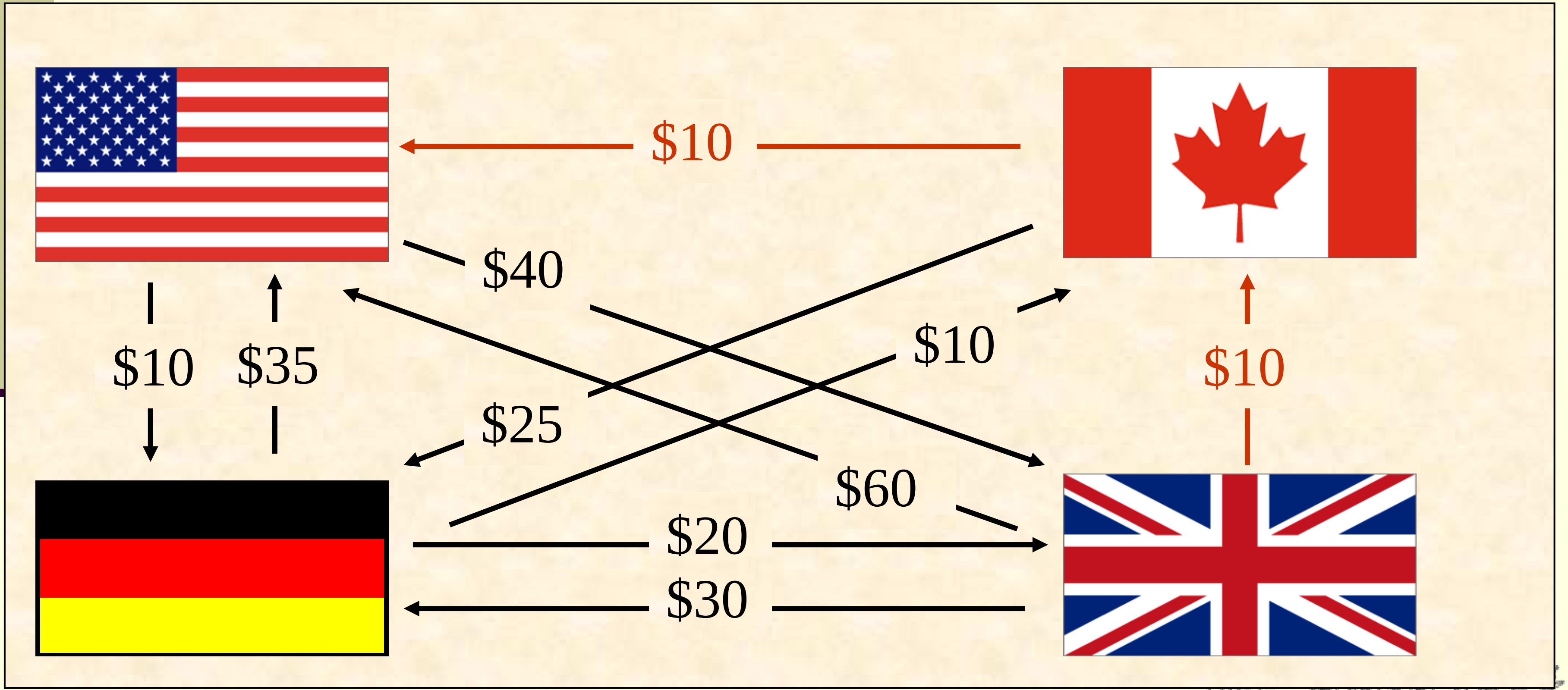

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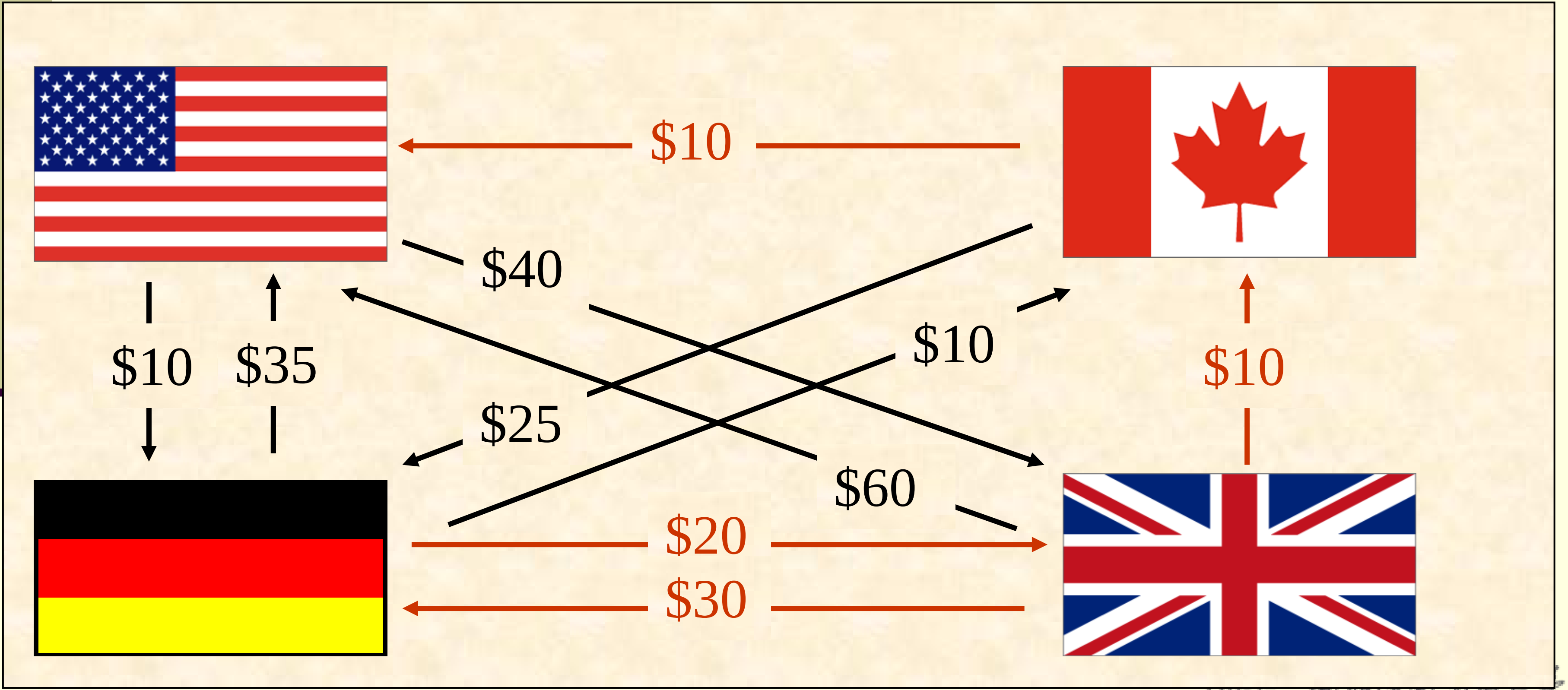

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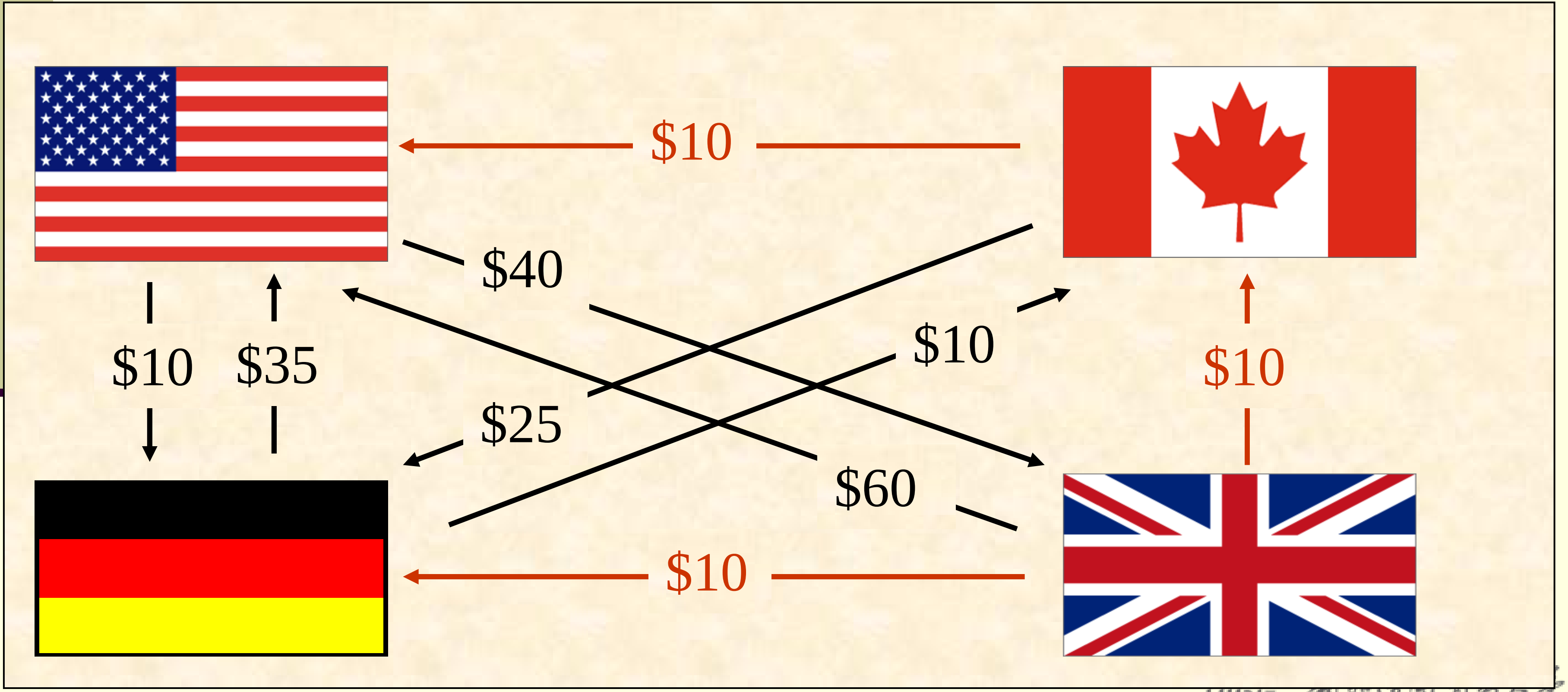

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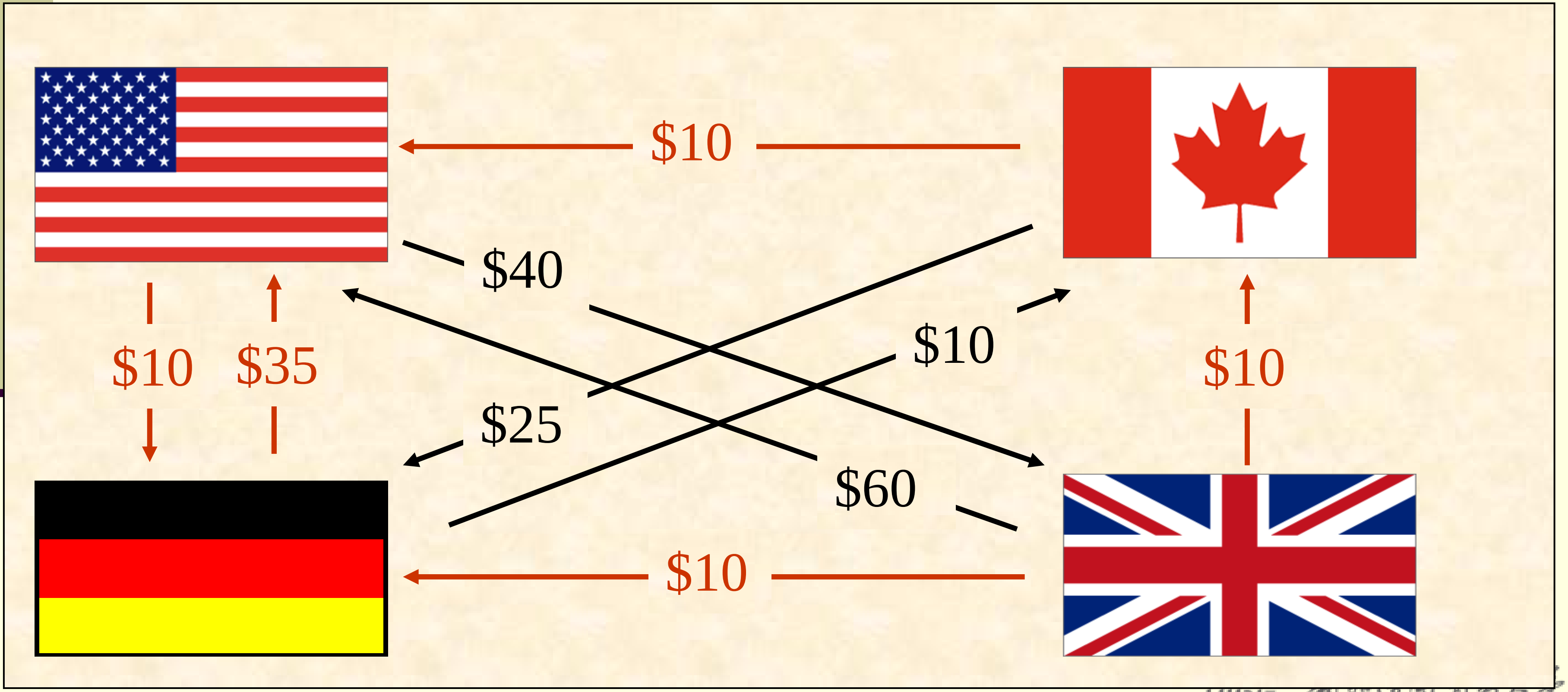

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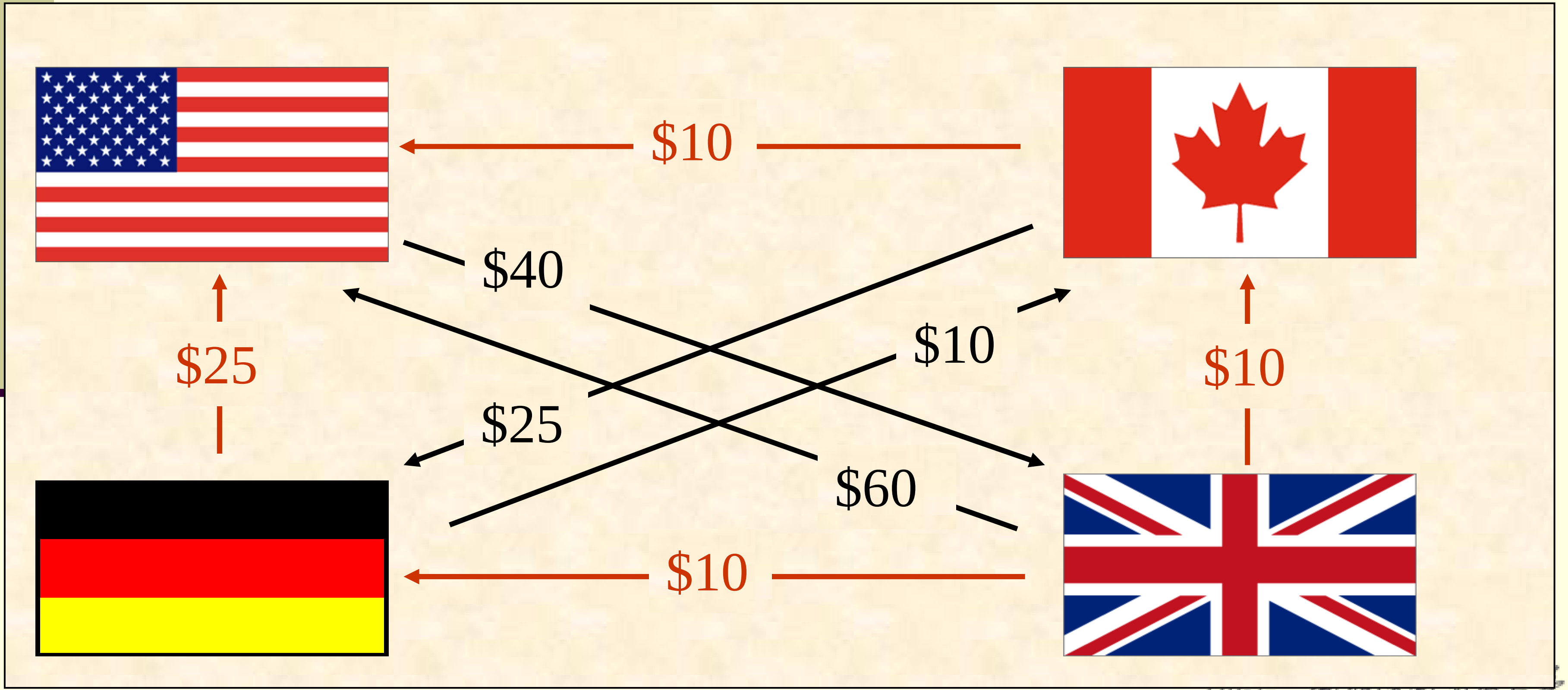

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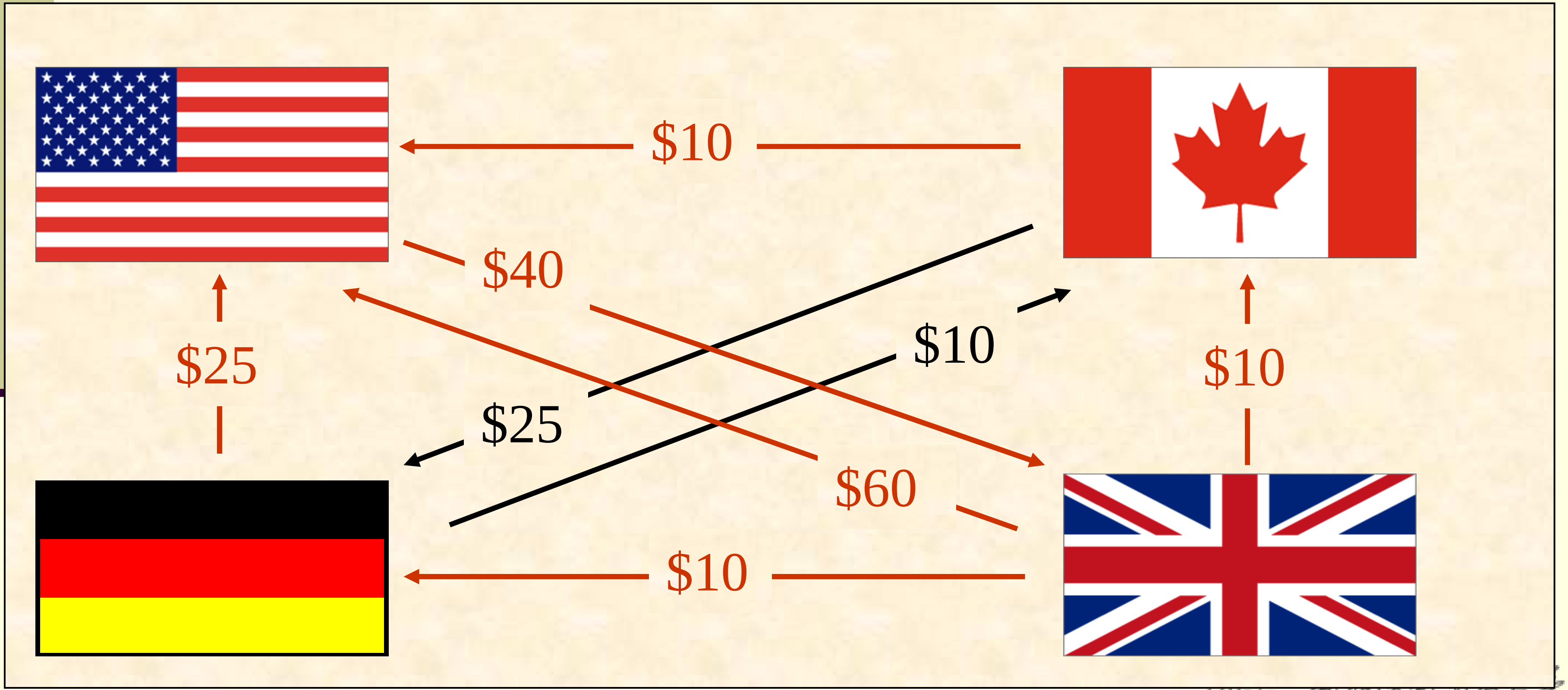

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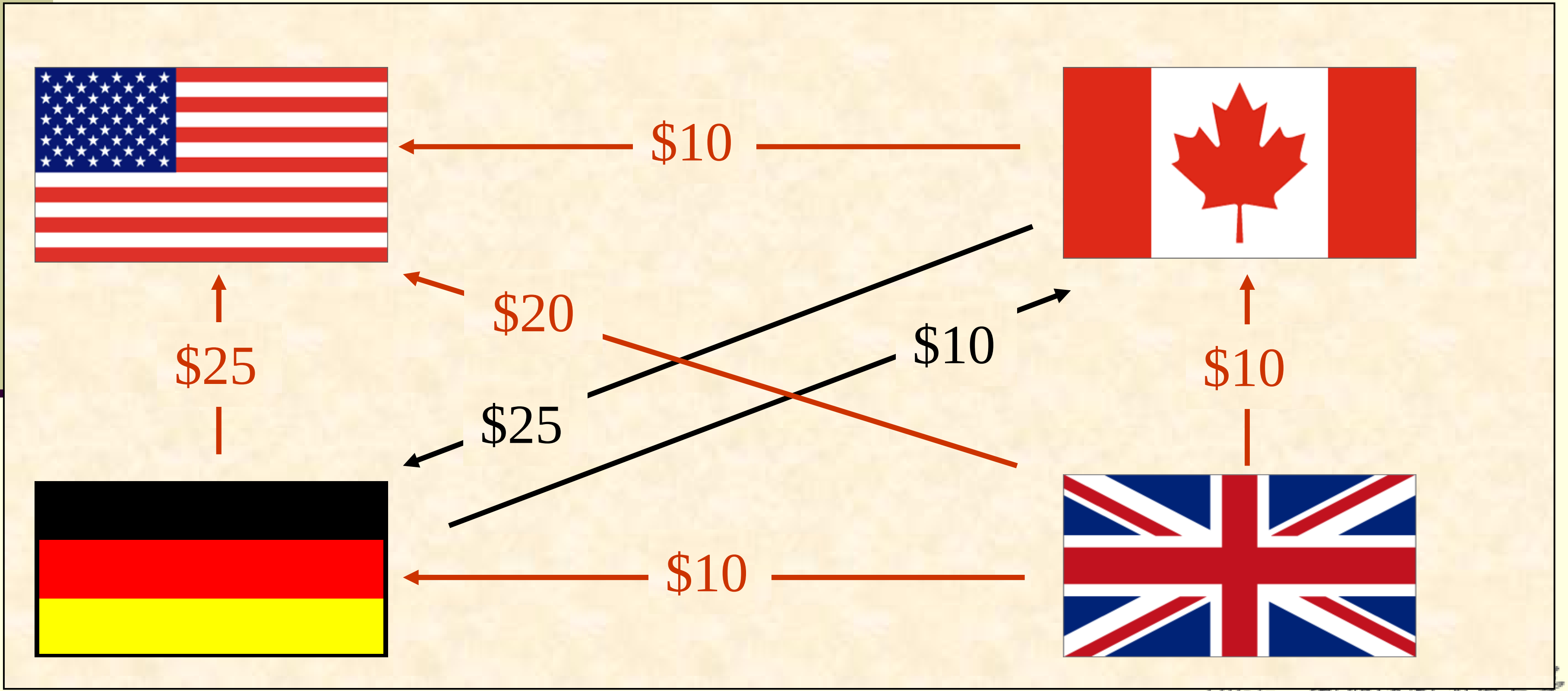

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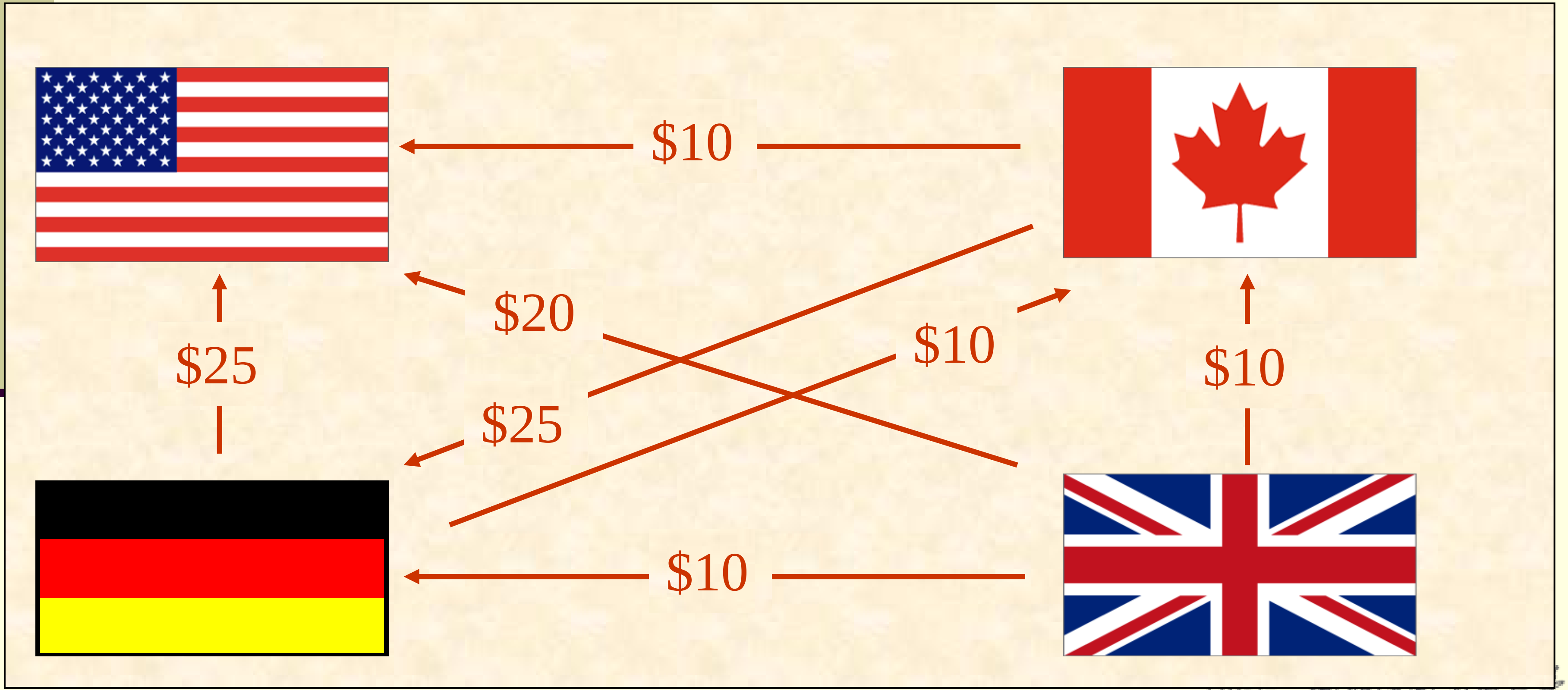

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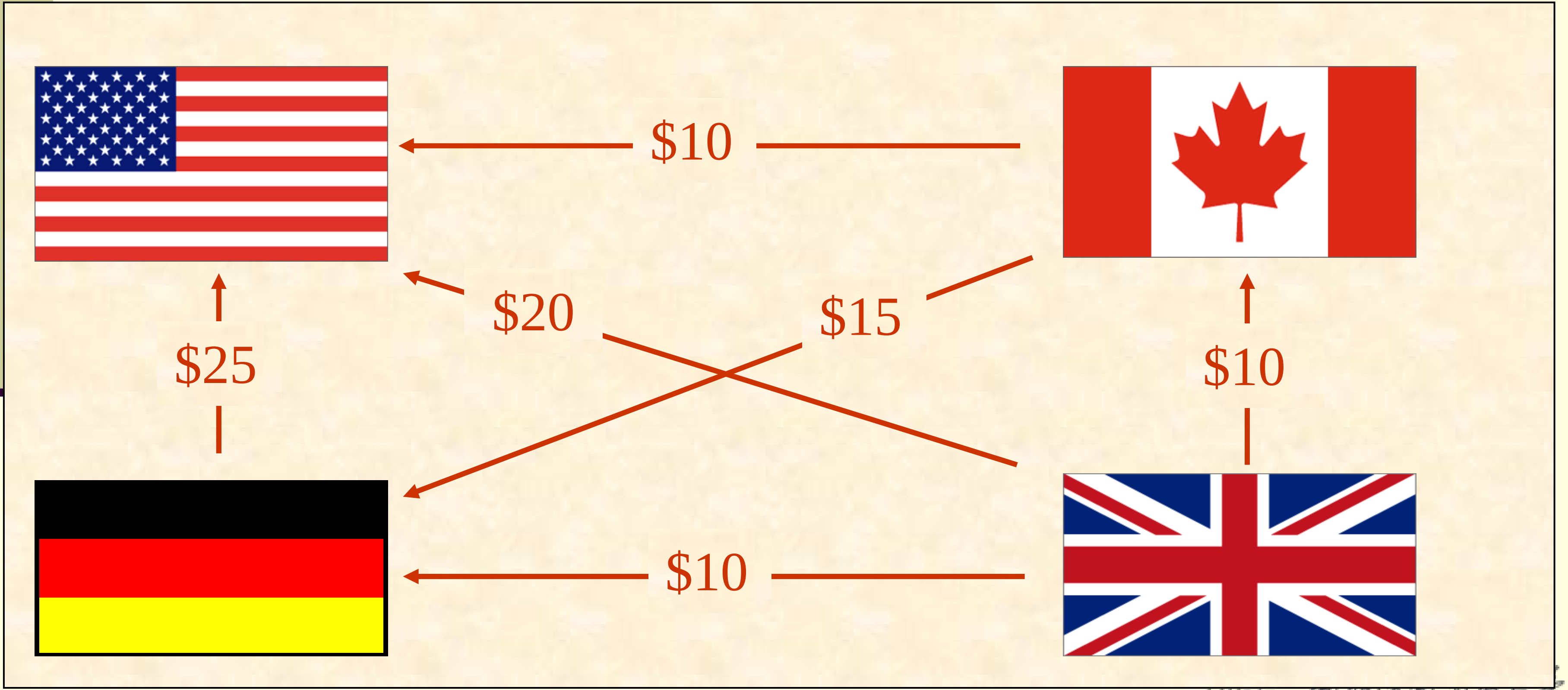

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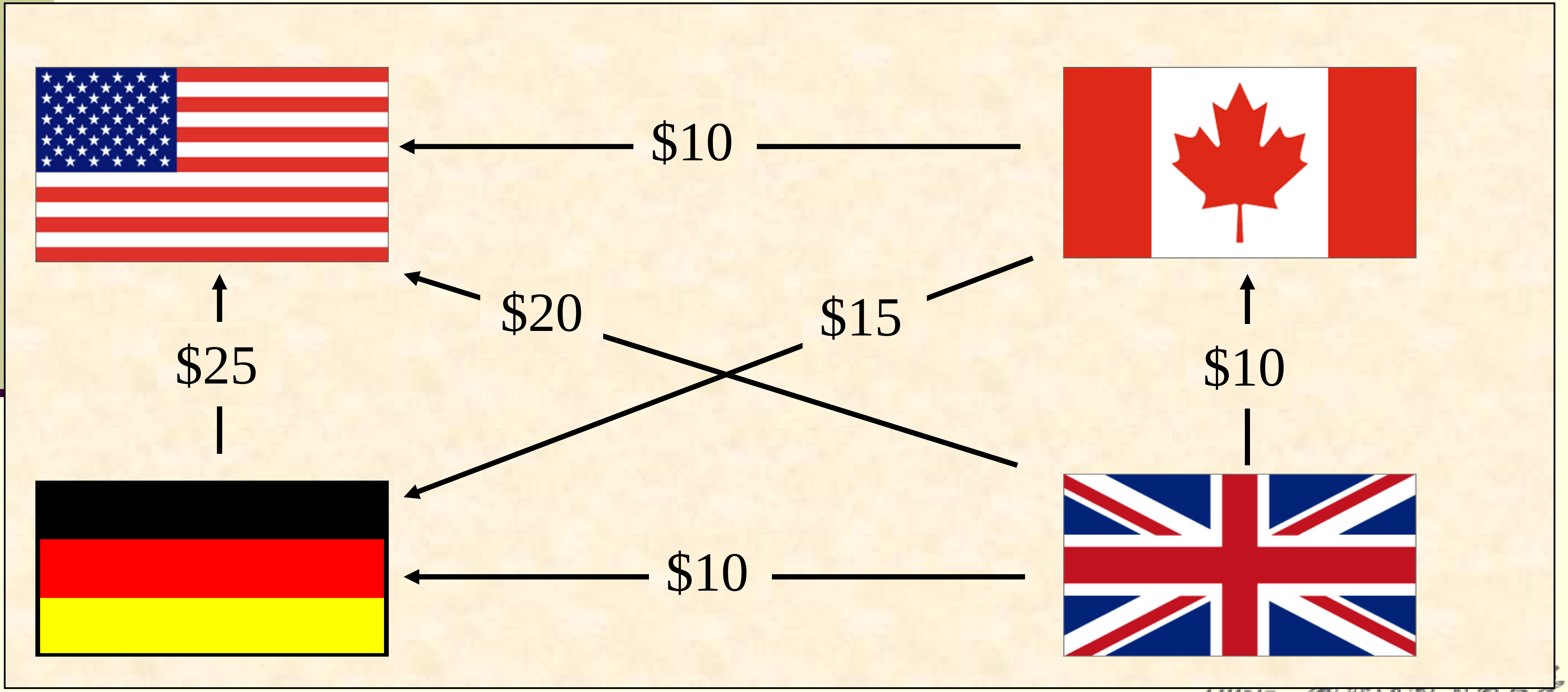
Exposure Netting: an Example

Consider simplifying the bilateral netting with multilateral netting:



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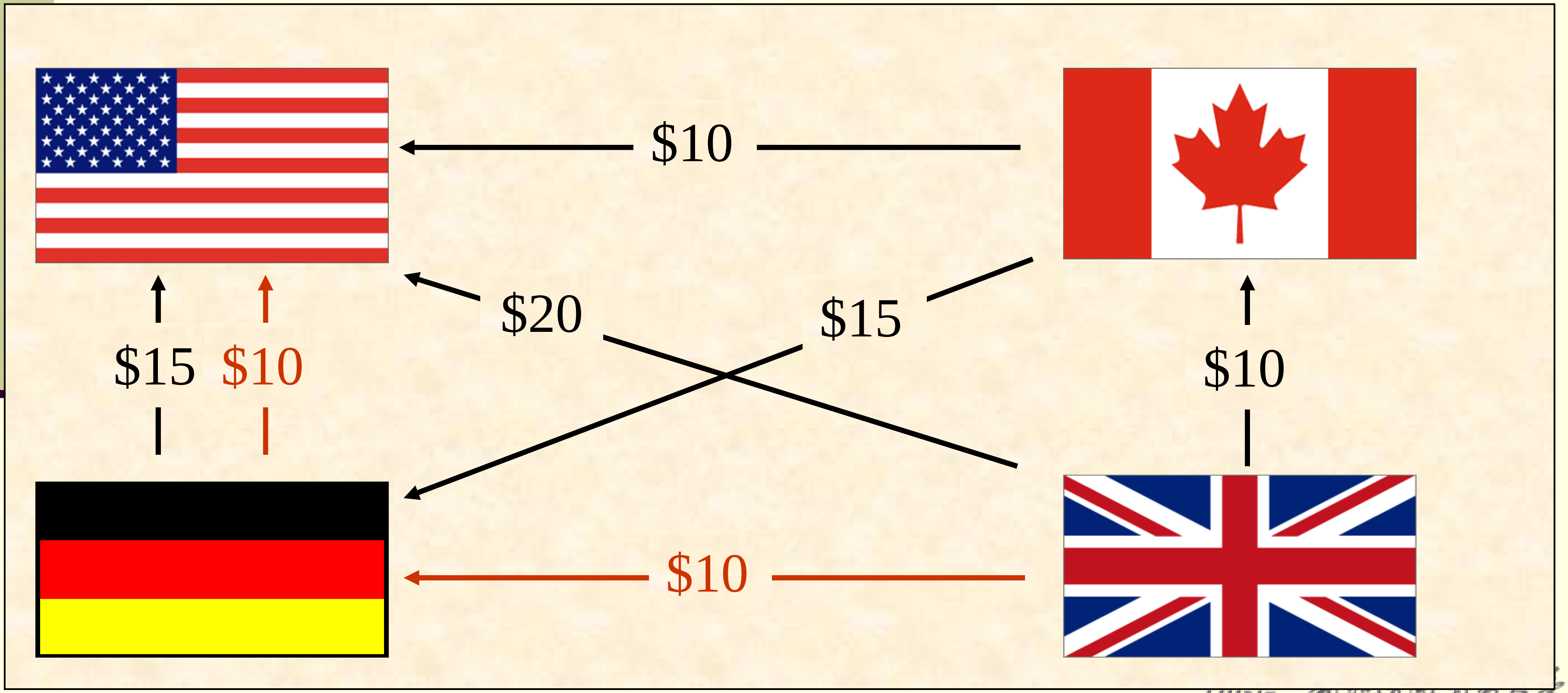

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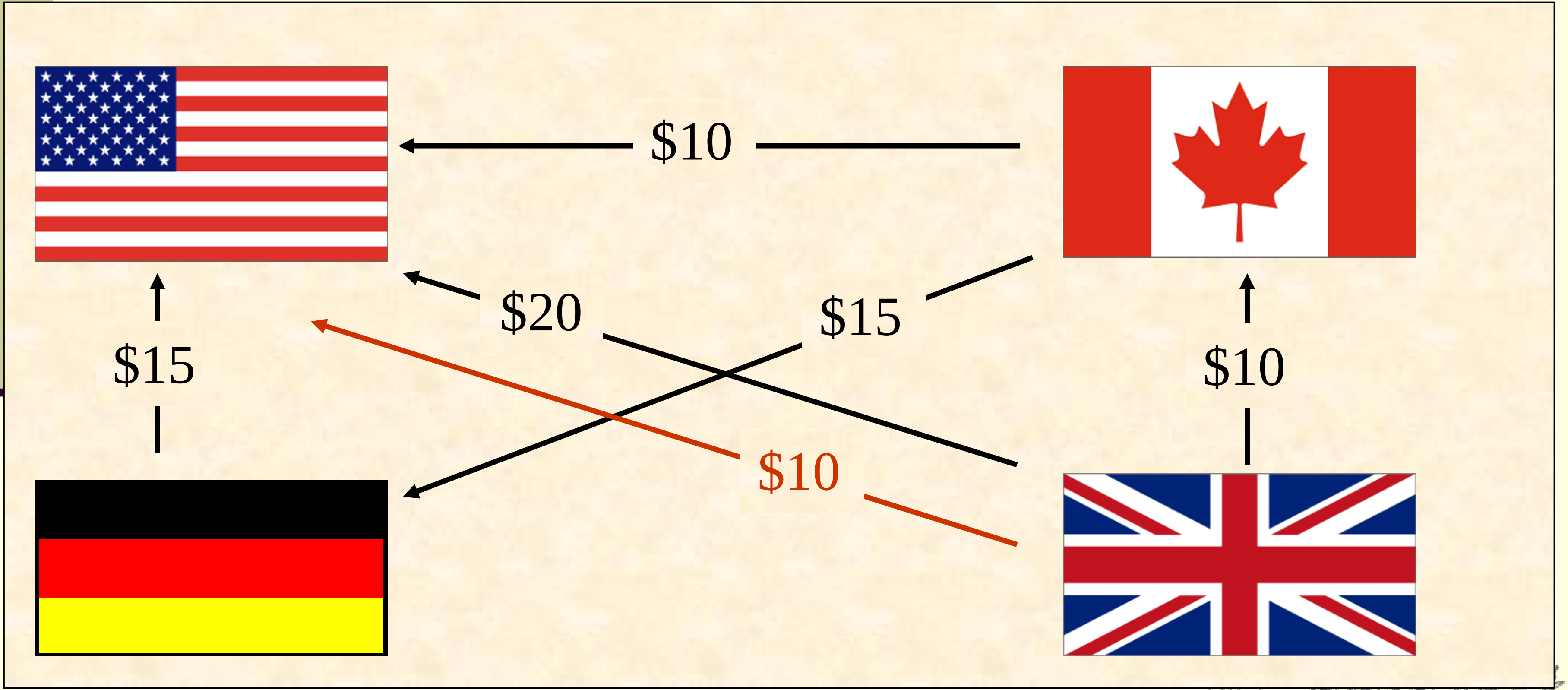

Exposure Netting: an Example

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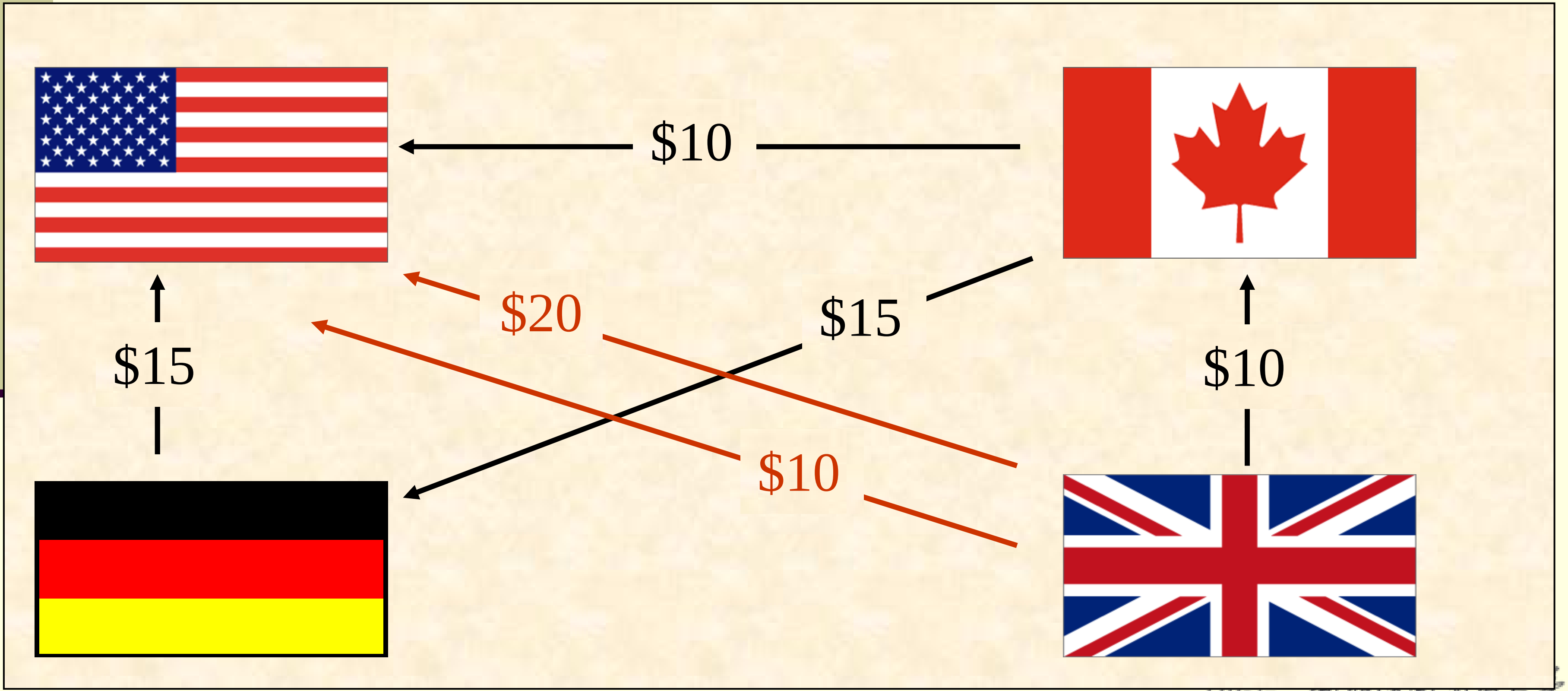

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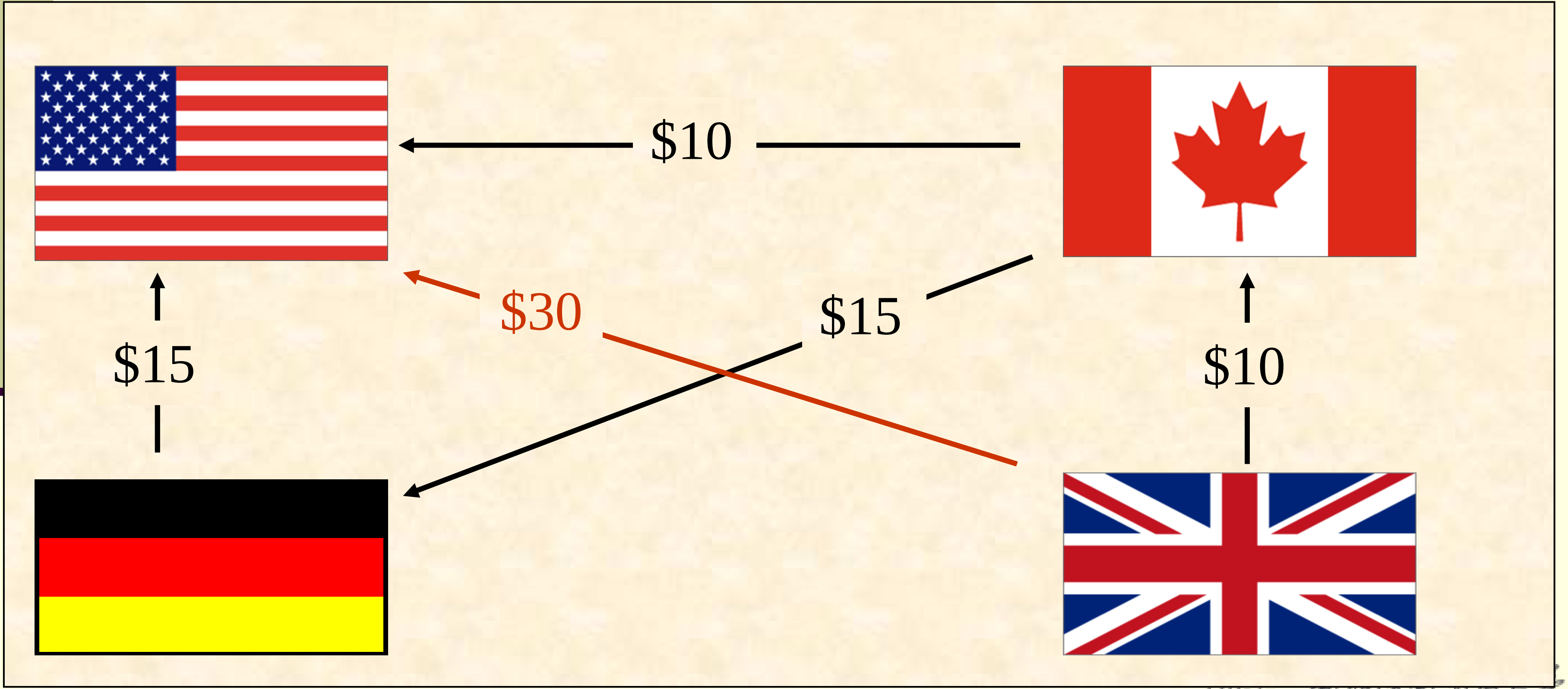

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Exposure Netting: an Example

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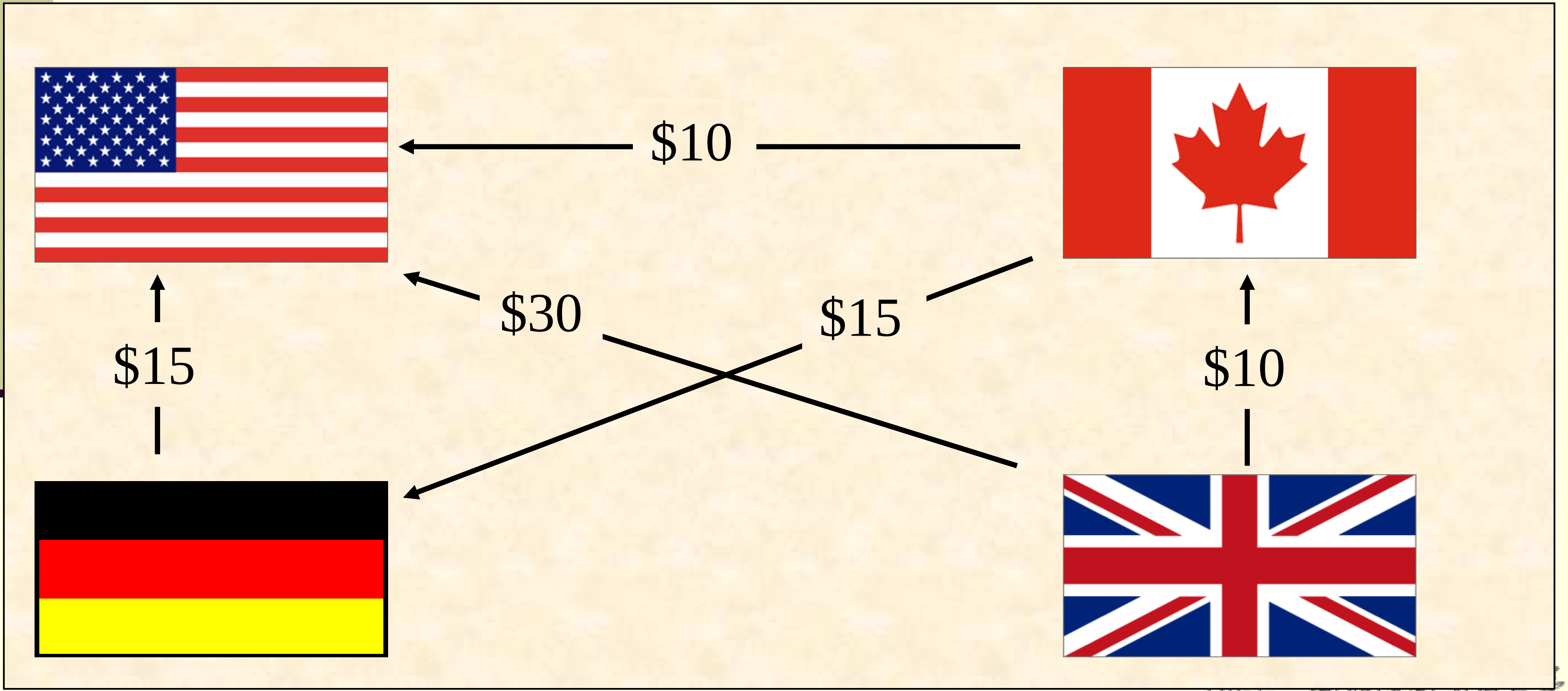

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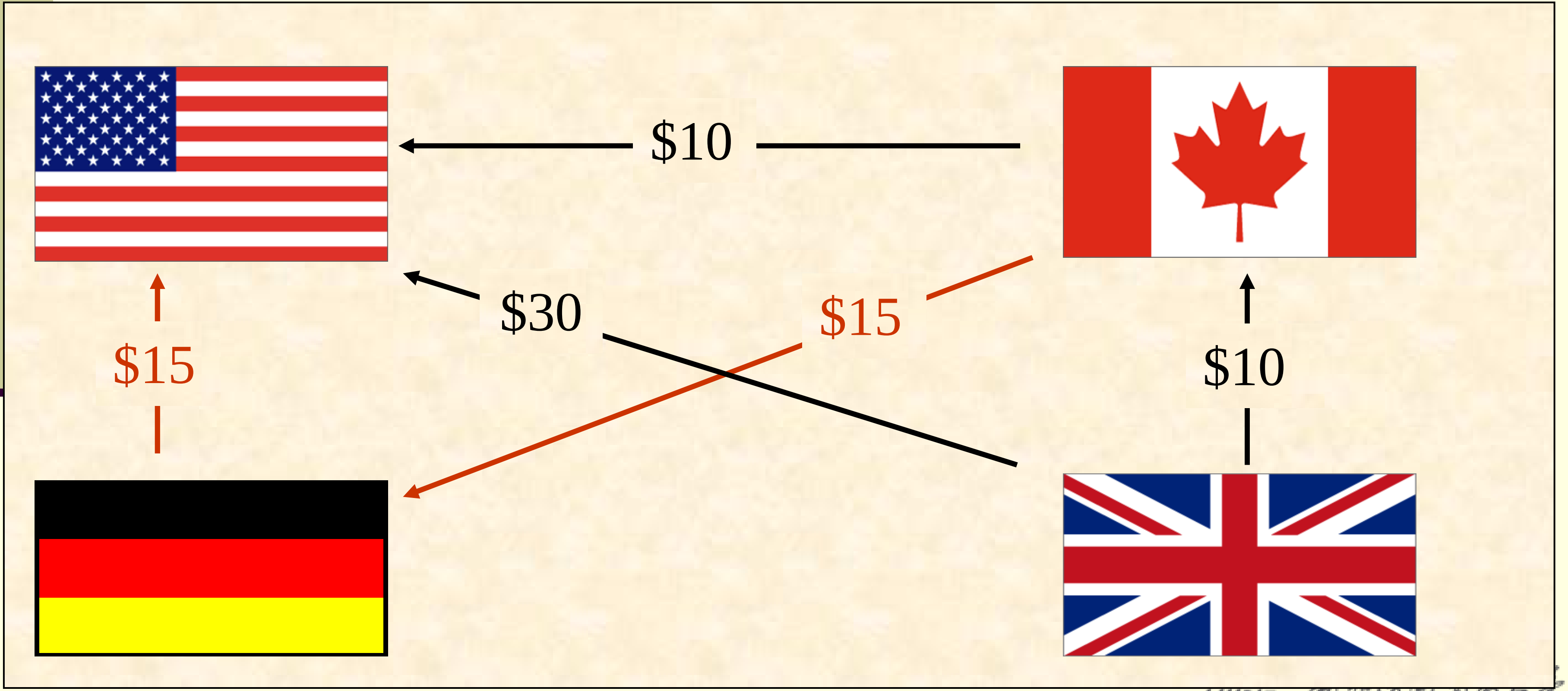

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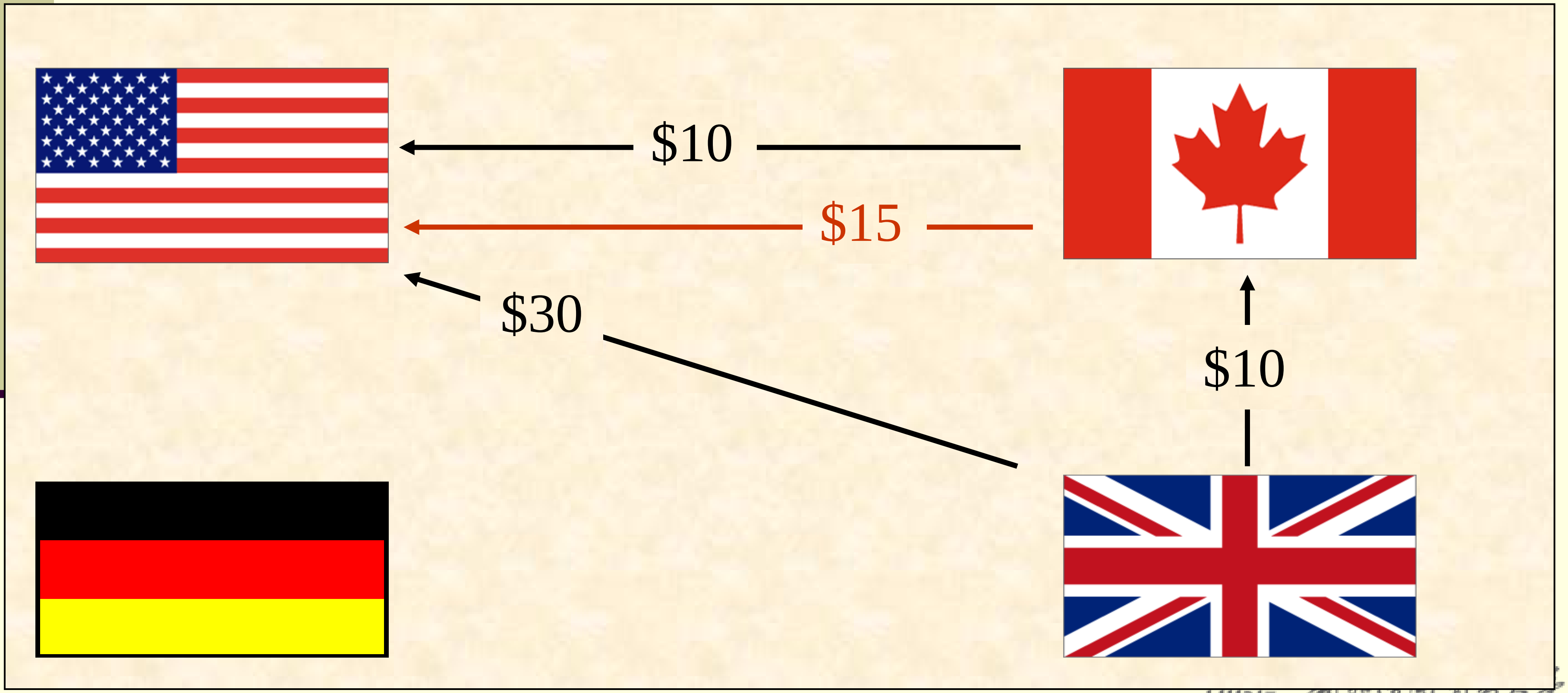

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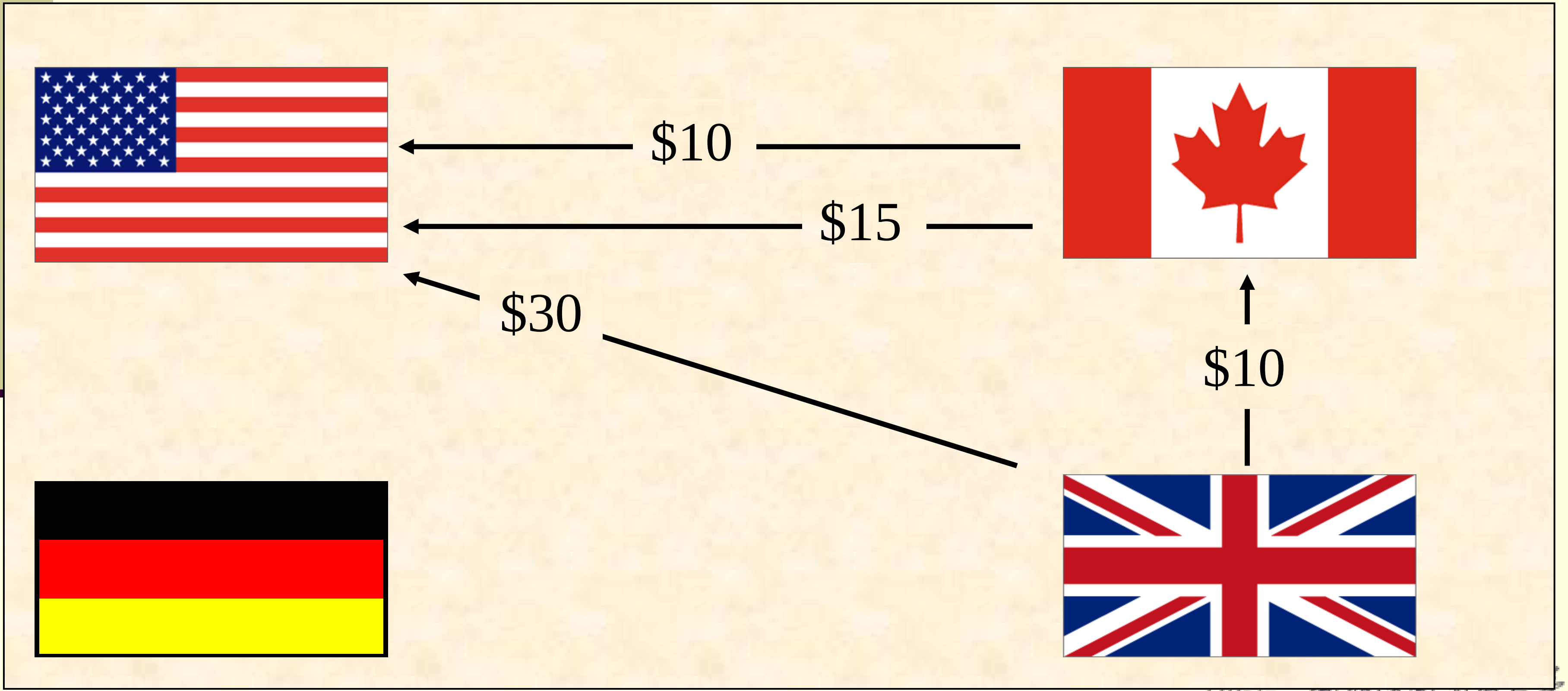

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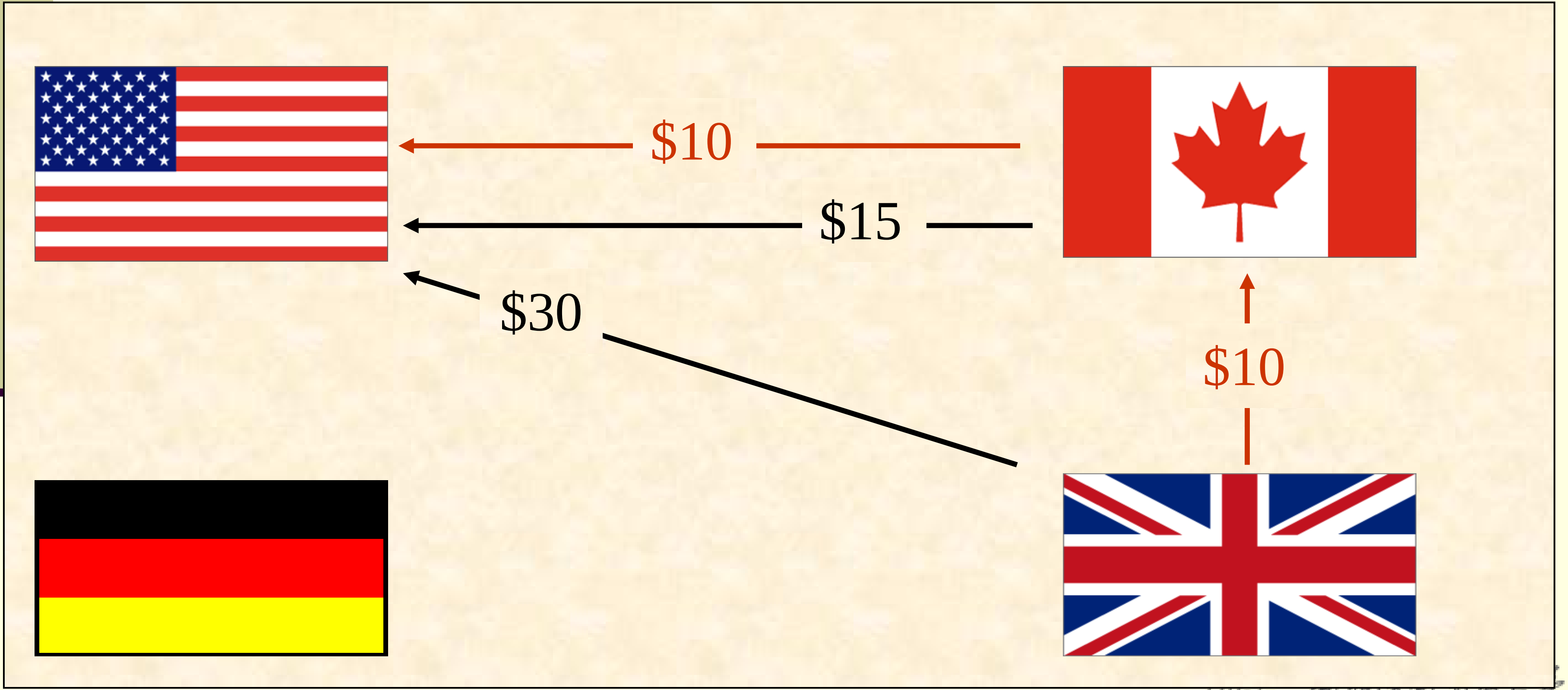

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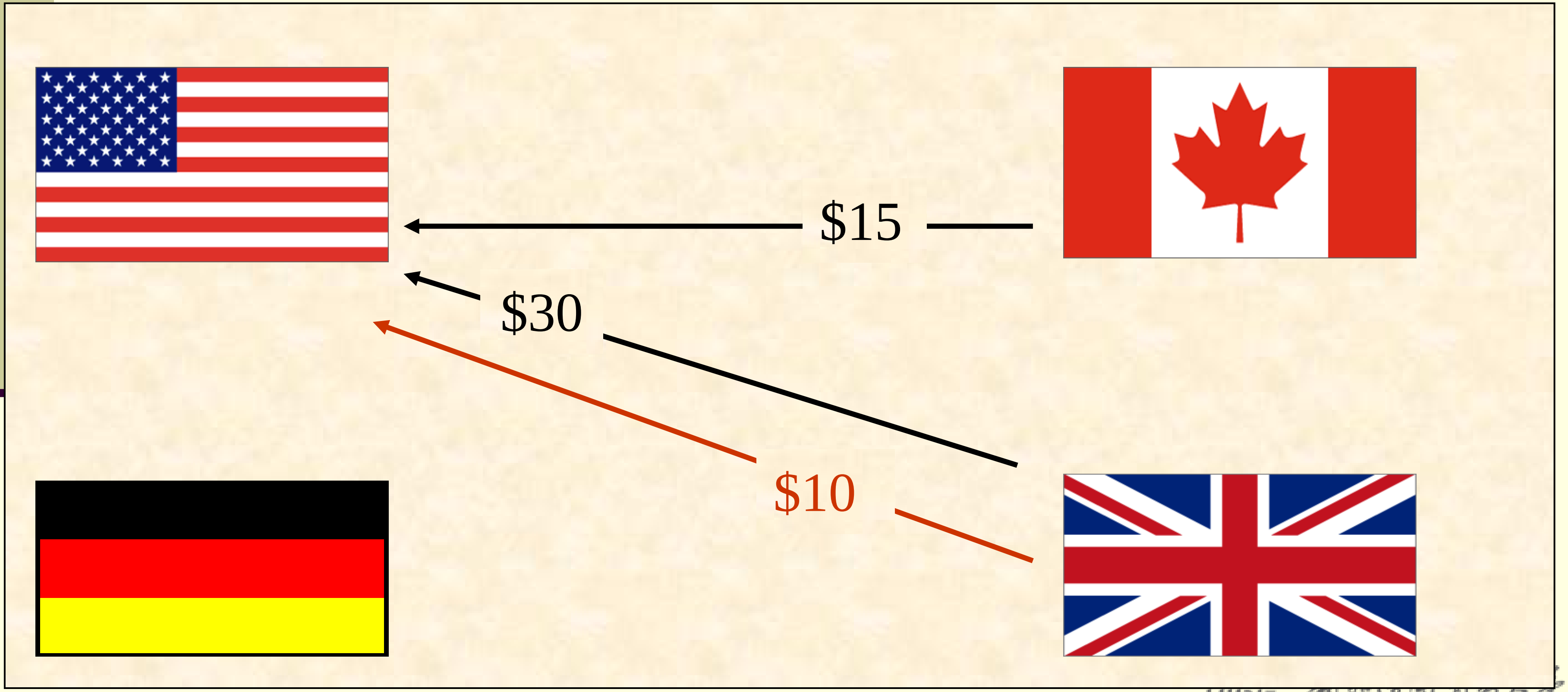

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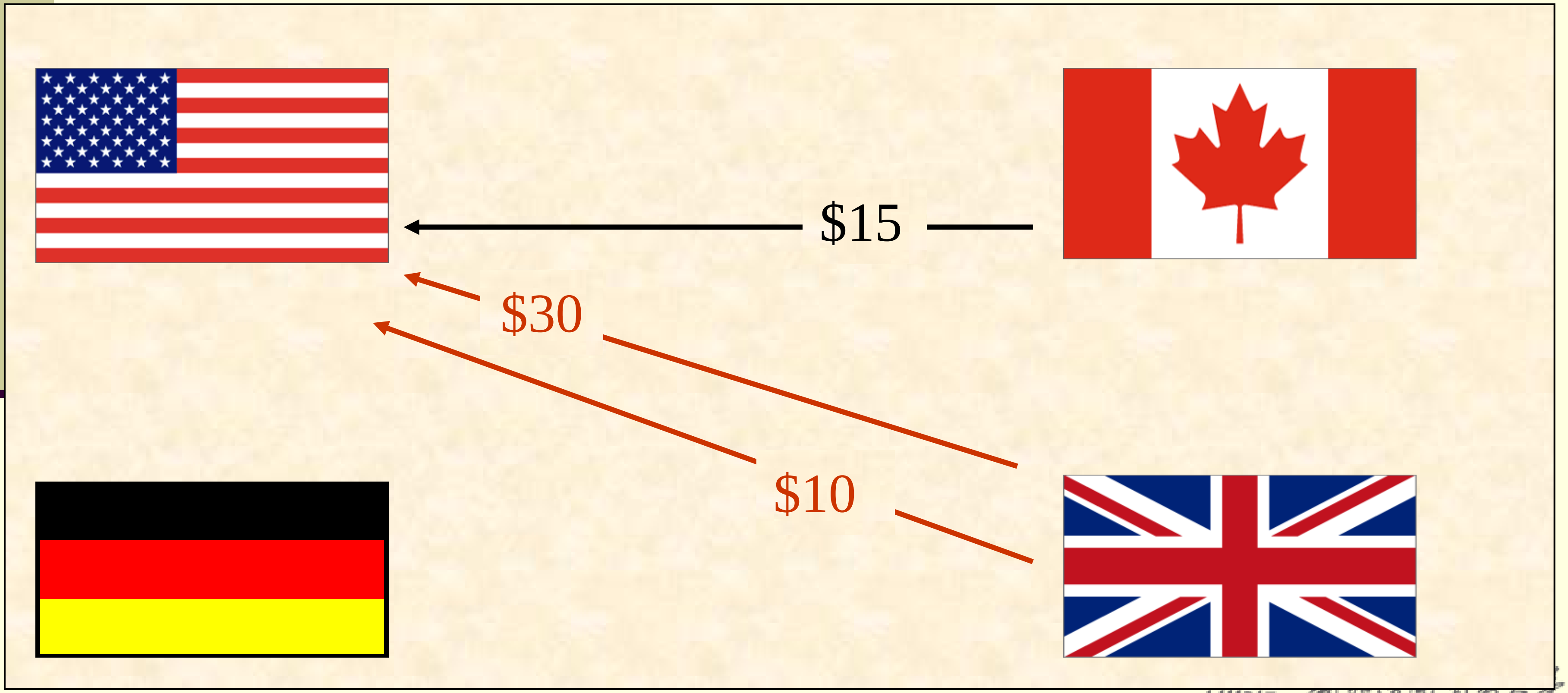

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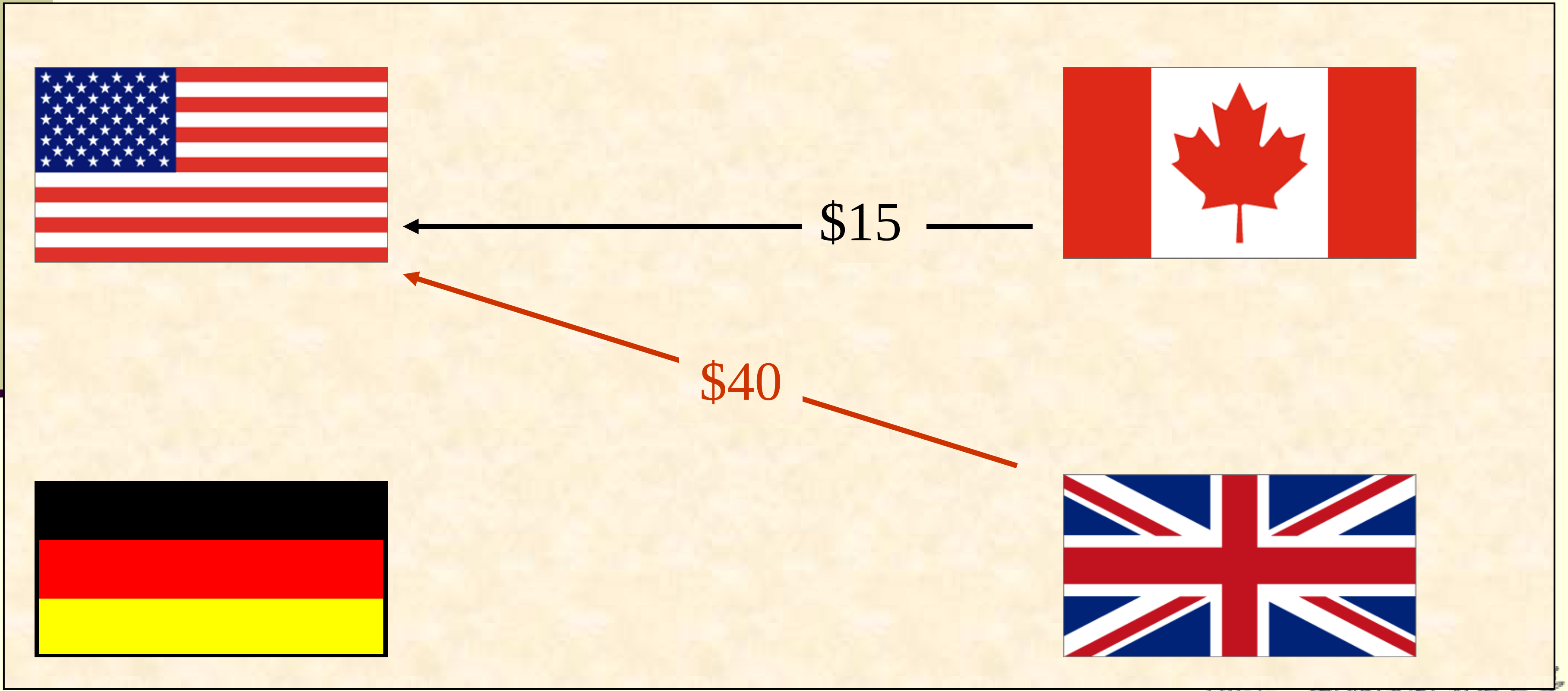
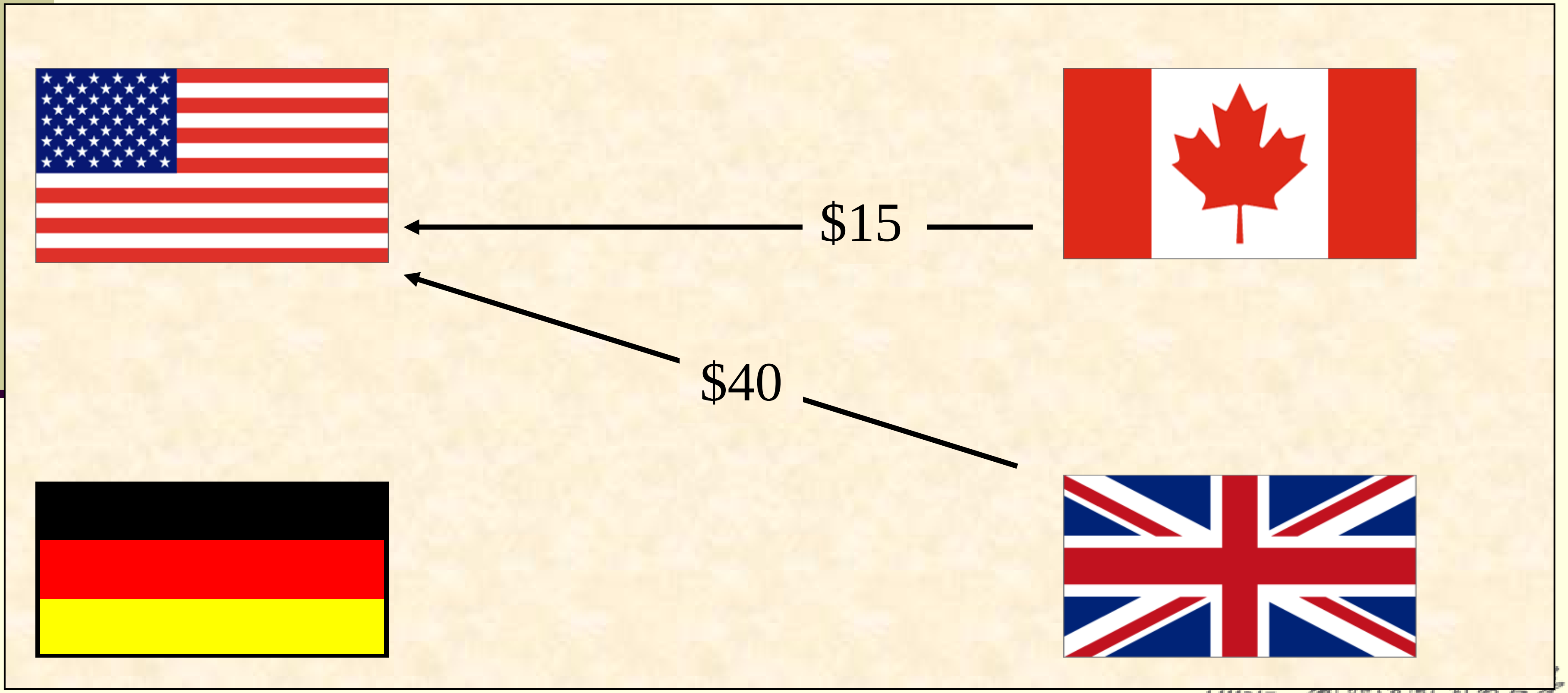


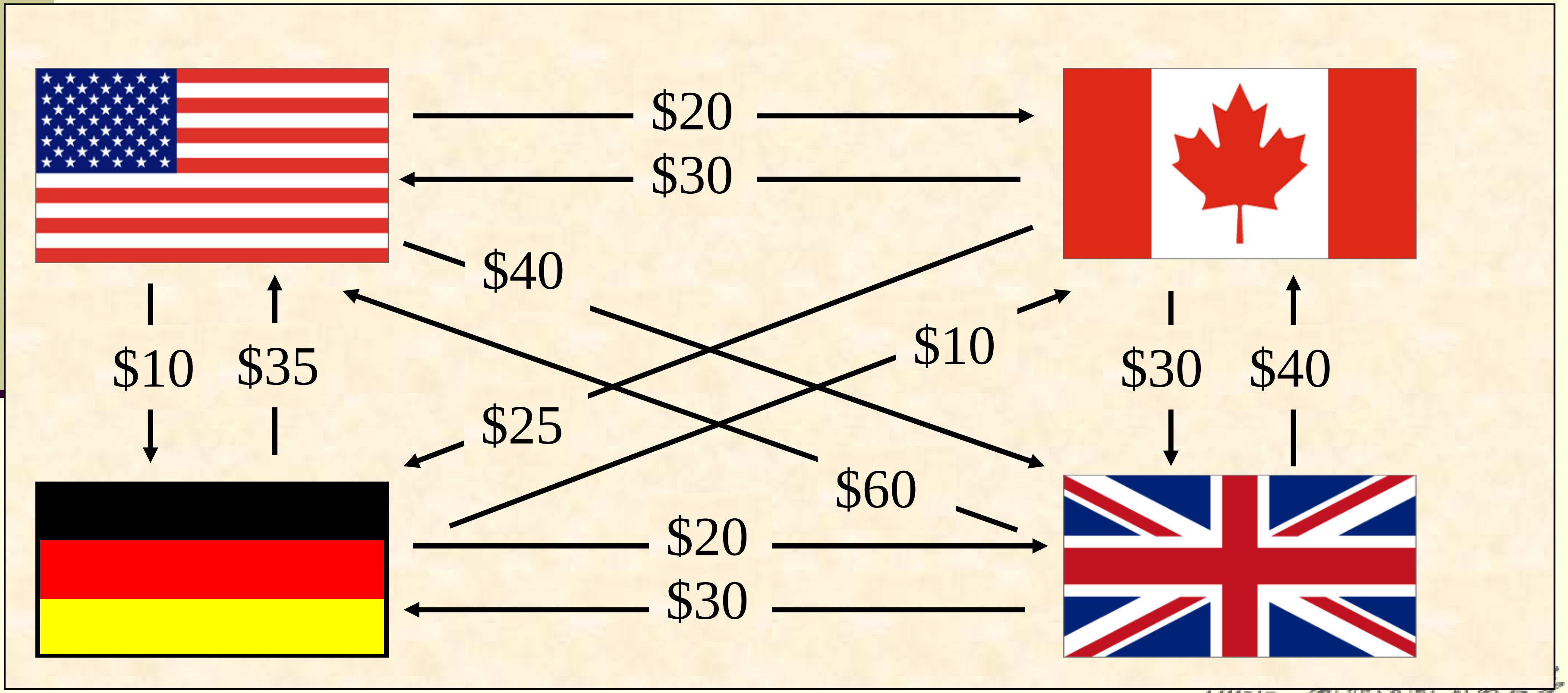
Exposure Netting: an Example

Clearly, multilateral netting can simplify things greatly.



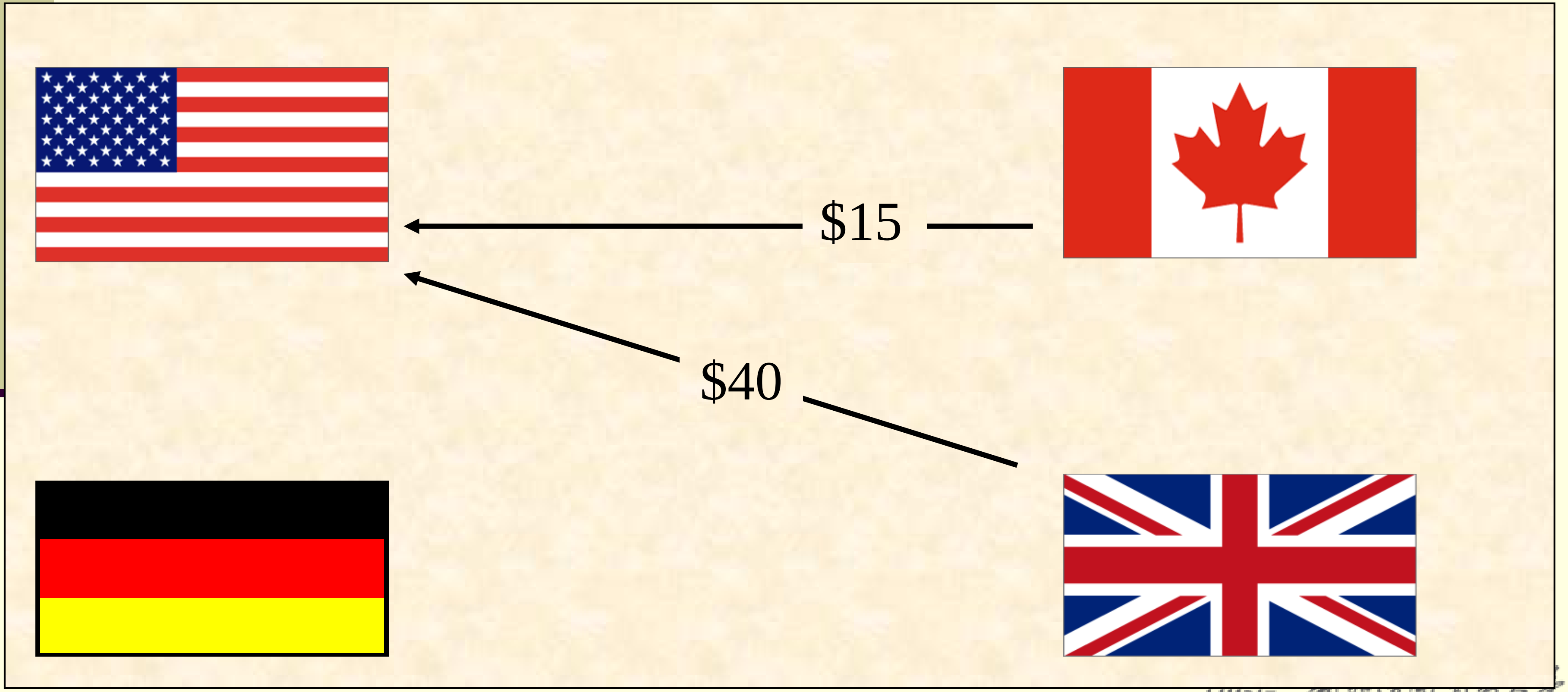
Exposure Netting: an Example

Compare this:



Exposure Netting: an Example

With this:



Overview of Translation

- Accounting exposure, also called translation exposure, arises because financial statements of foreign subsidiaries – which are stated in foreign currency – must be restated in the parent’s reporting currency for the firm to prepare consolidated financial statements.
- The accounting process of *translation*, involves converting these foreign subsidiaries financial statements into home currency-denominated statements.

Overview of Translation

- Translation exposure is the potential for an increase or decrease in the parent's net worth and reported net income caused by a change in exchange rates since the last translation.
- While the main purpose of translation is to prepare consolidated statements, management uses translated statements to assess performance (facilitation of comparisons across many geographically distributed subsidiaries).

Overview of Translation

- A foreign subsidiary's *functional currency* is the currency of the primary economic environment in which the subsidiary operates and in which it generates cash flows.
- In other words, it is the dominant currency used by that foreign subsidiary in its day-to-day operations.

Overview of Translation

- Current Rate Method
- Monetary/Non-monetary Method
- Temporal Method
- Current/Non-current Method

Overview of Translation

- Two basic methods for the translation of foreign subsidiary financial statements are employed worldwide:
  - The *current rate method*
  - The *temporal method*
- Regardless of which method is employed, a translation method must not only designate at what exchange rate individual balance sheet and income statement items are remeasured, but also designate where any imbalance is to be recorded (current income or an equity reserve account).

Overview of Translation

- The *current rate method* is the most prevalent in the world today.
  - Assets and liabilities are translated at the current rate of exchange
  - Income statement items are translated at the exchange rate on the dates they were recorded or an appropriately weighted average rate for the period
  - Dividends (*distributions*) are translated at the rate in effect on the date of payment
  - Common stock and paid-in capital accounts are translated at historical rates

Overview of Translation

- Gains or losses caused by translation adjustments are not included in the calculation of consolidated net income.
- Rather, translation gains or losses are reported separately and accumulated in a separate equity reserve account (on the B/S) with a title such as *cumulative translation adjustment* (CTA).
- The biggest advantage of the current rate method is that the gain or loss on translation does not pass through the income statement but goes directly to a reserve account (reducing variability of reported earnings).

Overview of Translation

- Under the *temporal method*, specific assets are translated at exchange rates consistent with the timing of the item's creation.
- This method assumes that a number of individual line item assets such as inventory and net plant and equipment are restated regularly to reflect market value.
- Gains or losses resulting from remeasurement are carried directly to current consolidated income, and not to equity reserves (increased variability of consolidated earnings).

Overview of Translation

- If these items were not restated but were instead carried at historical cost, the temporal method becomes the *monetary/nonmonetary* method of translation.
  - Monetary assets and liabilities are translated at current exchange rates
  - Nonmonetary assets and liabilities are translated at historical rates
  - Income statement items are translated at the average exchange rate for the period
  - Dividends (distributions) are translated at the exchange rate on the date of payment
  - Equity items are translated at historical rates

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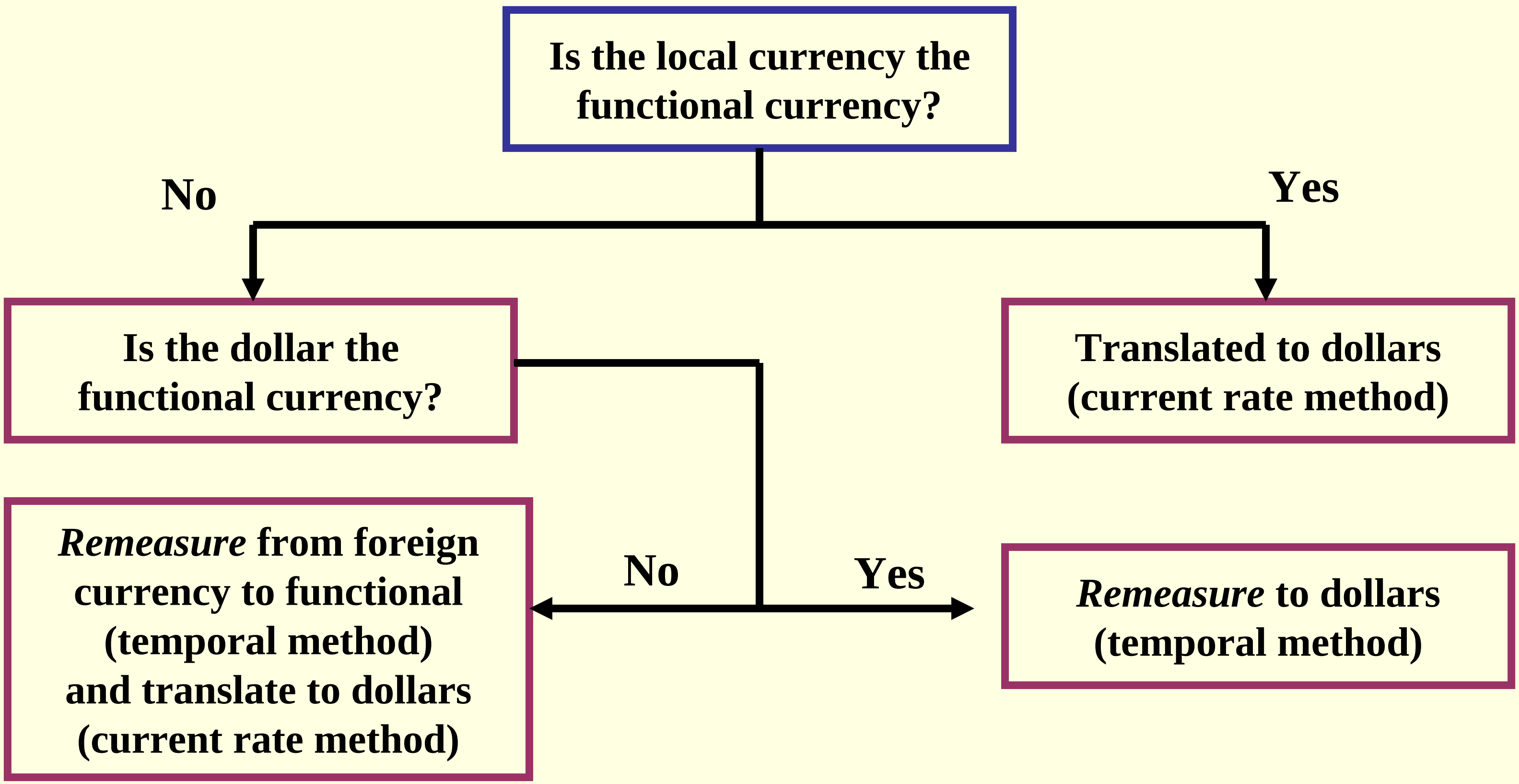
Overview of Translation

Items	Cur. Rate Method	Cur./Non-cur. Method	Mon/Non mon Method	Temporal Method
Cash	C	C	C	C
A/R	C	C	C	C
Inventories				
in cost	C	C	H	H
in Price	C	C	H	C
Investment				
in cost	C	H	H	H
in price	C	H	H	C
Fixed-assets	C	H	H	H
Other-assets	C	H	H	H
A/P	C	C	C	C
Long-term				
Debts	C	H	C	C
Capital Stock	H	H	H	H
Retained				
Earnings	X	X	X	X

Procedure Flow Chart for United States Translation Practices

<u>Purpose:</u> ***Foreign currency financial statements must be translated into U.S. dollars***

If the financial statements of the foreign subsidiary are expressed in a foreign currency, the following determinations need to be made.



* *The term "remeasure" means to translate, as to change the unit of measure, from a foreign currency to the functional currency.*

Managing Translation Exposure

- The main technique to minimize translation exposure is called a *balance sheet hedge*.
- A balance sheet hedge requires an equal amount of exposed foreign currency assets and liabilities on a firm's consolidated balance sheet.
- If this can be achieved for each foreign currency, net translation exposure will be zero.
- If a firm translates by the temporal method, a zero net exposed position is called monetary balance.
- Complete monetary balance cannot be achieved under the current rate method.

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Managing Translation Exposure

Net exposed assets＝Total exposed assets
－Total exposed liability

For Example: U.S. subsidiary in Mexico

Note payable: Mex$ 10,000 US$ 10,000
(Mexican Bank) (American Bank)

If : Peso↓5％

U.S. Parent Firm: gain: 5％ loss: 5％

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Managing Translation Exposure

If：Net exposed assets＝－ Mex$ 1,000,000

Peso expected↓5%，　　Parent Firm：gain: 5%

Mex$ 1,000,000×5%＝ Mex$ 50,000

If :Net Exposed assets＝＋ Mex$ 1,000,000

Parent Firm：looses: 5%

Mex$ 1,000,000×5%＝ Mex$ 50,000

Net exposed assets > 0 functional currency↓(↑)

⇒Translation loss（gain）

Net exposed assets < 0 functional currency↓(↑)

⇒ Translation gain（loss）

Balance Sheet Hedge—Net exposed assets＝0

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Managing Translation Exposure

案例分析：中国公司在墨西哥的子公司的职能货币是比索，返回母公司的货币是美元，在墨西哥比索的价值相对于美元的价值下降时，其换算价值也会随之改变。该公司对以下账户应怎样管理以避免外汇风险？

A/R (Mex$)	现金比索	债务**(Mex$)**
A/R(US$)	现金美元	**A/P(US$)**
贷款项目**(US$)**		