

**INTERNATIONAL FINANCE**



**MGMT 957**

**CROSS-BORDER CAPITAL BUDGETING  
& JOINT VENTURE**

“Domestic” NPV Calculation .....	2
Cross-border Capital Budgeting .....	3
Project-viewpoint Valuation .....	5
Parent-viewpoint Valuation .....	7
International Joint Venture .....	9
The BICC Case .....	9
Project vs. Parent Viewpoints .....	10
Sensitivity Analysis .....	14
Strategies based on Project vs. Parent Viewpoint Valuations .....	15
Currency Risk .....	16
NPV Calculation of Blocked Funds .....	17
Practice Problem Set with Solutions.....	18

---

## CROSS-BORDER CAPITAL BUDGETING & JV

---

### “DOMESTIC” NPV CALCULATION

$$NPV = \sum_t \frac{E[CF_t]}{(1 + i_{WACC})^t}$$

1. Identify the **initial capital** invested
2. Estimate **cash flows**,  $E[CF_t]$ 
  - ♦ Include only **incremental** cash flows
  - ♦ Include all **opportunity costs**
  - ♦ Do **not** include **sunk costs**

How to do this? You could:

- ♦ Obtain **revenue forecasts** from marketing
  - ♦ **Cost projection** from engineering, production, and human resources departments
3. Identify a **risk-adjusted discount rate**,  $i_{WACC}$
  4. Compute the NPV

### Weighted Average Cost of Capital (WACC)

- ❖ Idea: Discount after-tax cash flows to debt and equity at a **weighted average** of the **after-tax** required returns of **debt** and **equity**.
- ❖ When a firm has both **debt** and **equity** in its capital structure, its financing cost can be represented by **weighted average cost of capital (WACC)**

$$i_{WACC} = \frac{B}{B + S} i_B (1 - T_C) + \frac{S}{B + S} i_S$$

- $B$  = the **market value** of corporate **bonds**
- $S$  = the **market value** of corporate **stock**
- $i_B$  = **required return** on corporate **bonds** (yield on existing debt)
- $i_S$  = **required return** on corporate **stock** (from CAPM, ICAPM, APT, etc.)
- $T_C$  = marginal corporate **tax rate**

---

**CROSS-BORDER CAPITAL BUDGETING & JV**

---

**CROSS-BORDER CAPITAL BUDGETING**

**Cross-border capital budgeting** differs from the domestic capital budgeting in the following ways:

- ❖ Conversion of foreign CFs to \$
  - **RPPP**  $\Leftarrow$  Usually easier; you typically have all inputs (inflation rates)
  - **IRP** (long-dated forward rates) + Forward Parity = Uncovered IRP
- ❖ Explicitly recognizes the difference between the **project viewpoint** vs. **parent viewpoint**
  - The **project viewpoint** evaluates the investment as a whole from the perspective of **local investors**.
  - The **parent-viewpoint** focuses on the actual cash inflows to and outflows from the **parent company**.
- ❖ These two viewpoints can differ because of:
  - **Partial remittance**, blocked funds
    - Example: In the 1990's, **Chile** required investors to “park” part of their incoming money in non-interest bearing accounts for two years.
  - Difference in **foreign and domestic tax rates**
    - If there is **foreign tax credit**,  
Marginal corporate **tax rate** = the larger of the parent's or foreign subsidiary's

---

## CROSS-BORDER CAPITAL BUDGETING & JV

---

### Example: Superior Machine Oil Company

Privately owned Superior Machine Oil Company is considering investing in the Czech Republic so as to have a refinery source closer to its European customers. The **original investment** in Czech korunas would amount to **K250 million**, or \$10 million at the current spot rate of K25/\$, all in fixed assets, which will be **depreciated over 10 years** by the straight-line method.

For capital budgeting purposes, Superior assumes **sale of the refinery** as a going concern at the end of the **3<sup>rd</sup> year** at a price, after all taxes, equal to the net book value of fixed assets. **All the net income will be repatriated to the U.S.** as soon as possible.

In evaluating the venture, Superior forecasts the **demand of 1 million units** in the 1<sup>st</sup> year, **growing at 20%** per annum, at a **price of €10 per unit**. Here is some more information used in the valuation:

#### Assumed market rates for the next 3 years

- ❖ Koruna spot rate : 25K/\$
- ❖ Euro spot rate : 1.30\$/€

**Question:** is this assumption for spot rates appropriate? How could you improve it? Be aware of the different currency risks in the revenues and costs.

#### Costs and taxes

- ❖ **Fixed** cash operating expenses : K50 million
- Variable** manufacturing costs : 50% of sales
- ❖ **Czech** corporate **tax** rate : 25%
- US** corporate **tax** rate : 40%
- ❖ Both countries allow a **foreign tax credit** for taxes paid in other countries.

#### Other information

- ❖ Superior's **WACC** : 18%
- ❖ The Czech Republic imposes **no restrictions on repatriation** of any funds.

Adapted from Eiteman et.al, "Multinational Business Finance," 11<sup>th</sup> edition.

**CROSS-BORDER CAPITAL BUDGETING & JV**

**PROJECT-VIEWPOINT VALUATION**

- ❖ The **project-viewpoint analysis** applies a common procedure that is applicable to both **international and domestic** projects.
- ❖ Key: starting from the net income (NI),
  - Add back **depreciation**.
  - Include other cash flows (**initial investment, sale/terminal value**)
- ❖ Sometimes the NPV is calculated in the foreign currency (see the Semen Indonesia example in Eiteman, et.al, 11<sup>th</sup> ed., Chapter 18).

<b>Assumptions</b>	0	1	2	3
(a) Original investment (korunas, K mil.)	250			
(b) Koruna spot rate (K/\$)	25.00	25.00	25.00	25.00
(c) Unit demand (mil.)	20%	1.00	1.20	1.44
(d) Unit sales price (euro)	€ 10	€ 10	€ 10	€ 10
(e) Euro spot rate (\$/euro)	\$ 1.30	\$ 1.30	\$ 1.30	\$ 1.30
(f) Unit sales price (\$)	\$ 13.00	\$ 13.00	\$ 13.00	\$ 13.00
(g) Fixed expenses (K mil.)		50	50	50

<b>Project Viewpoint (in US\$)</b>	0	1	2	3
(a) Initial investment	\$ (10.00)			
(b) Revenues		\$ 13.00	\$ 15.60	\$ 18.72
(c) Less variable costs		(6.50)	(7.80)	(9.36)
(d) Gross profit		\$ 6.50	\$ 7.80	\$ 9.36
(e) Less fixed expenses		\$ (2.00)	\$ (2.00)	\$ (2.00)
(f) Less depreciation	10 years	\$ (1.00)	\$ (1.00)	\$ (1.00)
(g) Earnings before taxes		\$ 3.50	\$ 4.80	\$ 6.36
(h) Less Czech income taxes	25%	\$ (0.88)	\$ (1.20)	\$ (1.59)
(i) Net income		\$ 2.63	\$ 3.60	\$ 4.77

(a) Dollar initial investment = K250M / (25K/\$)

(b) Revenues = Unit demand × Unit sales price (€10×1.3\$/€)

(c) Less variable costs, 50% of revenues in (b)

(d) Gross profit = Revenues – Variable costs

(e) Fixed expenses = Koruna fixed expenses K50M / (Spot rate 25K/\$)

Different FX risks

### CROSS-BORDER CAPITAL BUDGETING & JV

- (f) Depreciation = Initial investment \$10M / 10 years  
 (g) EBT = Gross profit – Fixed expenses – Depreciation  
 (h) Czech income taxes = EBT × 25%  
 (i) Net income = EBT – taxes

#### Depreciation Tax Shield

- ❖ Although **depreciation** is **tax deductible**, **cash is never paid out** by the firm.
- ❖ To calculate the cash flow for discounting, **depreciation must be added back**.

(j) Add back depreciation		\$ 1.00	\$ 1.00	\$ 1.00	
(k) Sale value				\$ 7.00	
(l) Free cash flow for discounting		\$ (10.00)	\$ 3.63	\$ 4.60	\$ 12.77
					<b>= 10 – 1×3yrs</b>
(m) PV factor at WACC	18%	1.0000	0.8475	0.7182	0.6086
(n) PV of cash flows		\$ (10.00)	\$ 3.07	\$ 3.30	\$ 7.77
NPV		<b>\$ 4.15</b>			
IRR		<b>37.4%</b>			

- (j) Add back depreciation  
 (k) Sale value = Initial investment \$10M – Sum of depreciation \$1M×3  
 (l) FCF = Net income + Depreciation added back + Sale value

**Free cash flow** (FCF) is a cash flow for **valuation purposes**.

That is, this is the **numerator of the DCF formula** ( $E[CF_t]$ ).

(m) PV factor =  $1/1.18^t$

(n) PV = FCF × PV factor

## CROSS-BORDER CAPITAL BUDGETING & JV

### PARENT-VIEWPOINT VALUATION

- ❖ Parent viewpoint is **favored** over the project viewpoint valuation.
  - But survey says most MNCs conduct **both analyses**.
- ❖ Key:
  - Start with the **remitted dividend**. By assumption, this is 100% of the net income (which could instead be a fraction of NI if not wholly owned).
  - Possible **additional taxes**, accounting for foreign tax credit

Parent Viewpoint (US\$)	0	1	2	3
(a) Dividends remitted to US parent = <b>NI, project-view (i)</b>	\$ 2.63	\$ 3.60	\$ 4.77	
(b) Add back Czech taxes deemed paid	\$ 0.88	\$ 1.20	\$ 1.59	
(c) Grossed up dividend = <b>EBT, project-view (g)</b>	\$ 3.50	\$ 4.80	\$ 6.36	
(d) Tentative US tax liability <span style="float: right;">40%</span>	\$ 1.40	\$ 1.92	\$ 2.54	↙ 40%
(e) Less credit for Czech taxes paid = <b>Foreign tax credit</b>	\$ (0.88)	\$ (1.20)	\$ (1.59)	
(f) Additional US taxes due on foreign income	\$ 0.53	\$ 0.72	\$ 0.95	= 15% EBT

- (a) Dividends (**Net Income** (i) from the project viewpoint valuation) remitted **in full**

This could be just a **fraction** of the total, if:

- **Joint venture** (see the BICC case)
- **Funds blocked** by the local government

Our next step is to compute the **additional US taxes due**.

- (b) Add back Czech taxes deemed paid
- (c) = (a) + (b), EBT in the project viewpoint valuation
- (d) Tentative US tax liability = (c) × 40%
- (e) **Foreign tax credit** = (b)
- (f) Additional US taxes due = (d) – Foreign tax credit

---

**CROSS-BORDER CAPITAL BUDGETING & JV**


---

(g) Cash dividend less added US taxes		\$ 2.10	\$ 2.88	\$ 3.82	= NI – US tax
(h) Initial investment		\$ (10.00)			
(i) Plus sale value at end of 3 years				\$ 7.00	
(j) Parent cash flows (US\$)		\$ (10.00)	\$ 2.10	\$ 2.88	\$ 10.82
(k) PV factor	18%	1.0000	0.8475	0.7182	0.6086
(l) PV of cash flow		\$ (10.00)	\$ 1.78	\$ 2.07	\$ 6.58
NPV		<b>\$ 0.43</b>			
IRR		<b>20.0%</b>			

(g) = (a) – Additional US taxes due (f)

---

**CROSS-BORDER CAPITAL BUDGETING & JV**

---

**INTERNATIONAL JOINT VENTURE**

A **joint venture** is a **shared ownership** in a foreign business.

- A foreign business unit that is 50% or more owned by the parent company is typically designated a **foreign subsidiary**. U.S. firms must consolidate foreign subsidiaries.
- If a firm is owned between 20% and 49% by a parent, it is called an **affiliate**. Affiliates are consolidated with the parent owner on a *pro rata* basis.
- Firms less than 20% owned are normally carried as unconsolidated **investments**.

**THE BICC CASE**

This is The St. Regis, Beijing.

<http://www.starwood.com/stregis/>

(Follow “Discover a St. Regis” > “Beijing.” The site mentions the Beijing International Club.)

**Key Questions**

- ❖ Does the BICC investment represent a **sound and prudent** entry into actual asset **ownership** in China?
  - What are the **risks and opportunities** of investing in China?
  - Are the prospective **economics** of the JV truly profitable?

---

**CROSS-BORDER CAPITAL BUDGETING & JV**

---

**Background****❖ Management contract vs. ownership**

- In 1985 SAPC signed the first hotel **management** contract in China for the Great Wall Sheraton hotel in Beijing.
- By 1996, SAPC had 5 hotels signed in mainland China, all on **management** contracts.
- SAPC had **no** experience with **joint ventures**, i.e., **shared ownership**.
- SAPC needed an ownership entry vehicle. BICC could be the linchpin for **expansion** not only in China, but **across the Asia Pacific**.

**❖ Sun Corporation **decided to sell 31%** (\$44 million) of its 40% ownership in the JV and approached SAPC.**

- Caveat: Sun is selling because they found business with the Chinese MFA **extremely difficult**.

**PROJECT VS. PARENT VIEWPOINTS****❖ Question:** The key analyses are in Appendices 3 and 4. Which one corresponds to the project viewpoint? Which one is the parent viewpoint?**❖ Question:** What is the result of the baseline capital budgeting analysis?

---

**CROSS-BORDER CAPITAL BUDGETING & JV**


---

Both analyses indicate an acceptable investment. SAPC's **hurdle rate** for Chinese investments is 18%.

	<u>Project Viewpoint</u>	<u>Parent Viewpoint</u>
NPV	\$53.5	\$1.63
IRR	26.4%	18.9%

- The parent viewpoint is based solely on **net cash flows remitted to SAPC** out of China. While this is acceptable, it does not necessarily give a strong sense of security.

### **Project Viewpoint—Appendix 3**

- ❖ EBITDA = earnings before interest, taxes, depreciation, and amortization  
(from the pro forma income statement in Appendix 2)
- ❖ EBIT = earnings before interest and taxes  
= EBITDA – depreciation & amortization
- ❖ NOPAT = net operating profit after taxes  
= EBIT – taxes
- Taxes are recalculated on the basis of EBIT.

**Net operating profit after-tax (NOPAT)** is a cash flow measure of **basic business profitability**.

---

**CROSS-BORDER CAPITAL BUDGETING & JV**

---

- ❖ **Operating cash flows** (OCF) are the actual cash flows being generated by the firm's operations
  - $OCF = NOPAT + \text{depreciation \& amortization, added back}$
  - **Depreciation** and **amortization** are **non-cash expenses**.
    - **Depreciation** is a charge for investments made in capital equipment
    - **Amortization** is a charge for investments made in other companies (acquisitions) over and above the value of the assets purchased
    - Although they are **tax deductible**, **cash is never paid out** by the firm
    - Thus, they must be **added back in** for calculation of actual **cash flows**
  
- ❖ **Free cash flow** (FCF) is a cash flow for **valuation purposes**.
  - $FCF = OCF - \text{changes in NWC} - CAPEX$   
 $= NOPAT + \text{depreciation \& amortization} - \text{changes in NWC} - CAPEX$ 
    - $CAPEX = \text{capital expenditures}$
  - **Net working capital** (NWC) =  $A/R + \text{Inventory} - (A/P + OCL)$ 
    - $A/R = \text{Accounts receivable}$
    - $A/P = \text{Accounts payable}$
    - $OCL = \text{Other current liabilities, e.g., accrued taxes and wages}$
    - NWC is typically a **positive** number
    - As sales grow, NWC typically rises as well
    - **Growth in NWC reduces the cash flows** of the firm

---

**CROSS-BORDER CAPITAL BUDGETING & JV**


---

**Parent Viewpoint—Appendix 4**

- ❖ The Parent Viewpoint focuses only on the **actual cash inflows to and outflows from the SAPC** as an outside investor.
- ❖ Therefore initial investments, dividends distributed, the terminal value etc, are **prorated shares** = 31%
- ❖ The parent viewpoint's net cash flow returns are dominated by **distributed earnings**. → See Appendix 4
- ❖ This would be **unusual for SAPC** since its historical business is based on operational contracts, generating operating and **management fee** income—rather than distributions to owners in the form of **dividends**.
- ❖ A general rule of thumb in any business line, domestically or internationally: returns generated **off the top-line of the business** (e.g., in the form of **management fees**) are preferred on those who must wait to see what the **residual results** are accruing to the **bottom-line** (e.g., **dividend distributions**).
  - This demonstrates that this specific BICC investment would be **considered riskier** by SAPC according to its own experience.
- ❖ The distinction between the project and the parent, and the top line and the bottom line, can be illustrated by the **management fees**.
  - If SAPC were able to increase the hotel management fees to 7.5% from 7.0%, the **Parent** Viewpoint's NPV would **increase** to about \$3 million and the IRR would rise to 19.6%. The **project** viewpoint, however, **would not change**.

Under 7.5% management fees:

	Project Viewpoint	Parent Viewpoint
NPV	\$53.5	\$2.95
IRR	26.4%	19.6%

---

## CROSS-BORDER CAPITAL BUDGETING & JV

---

### SENSITIVITY ANALYSIS

- ❖ What specific value-driver risks or sensitivities should be considered?
  - With only a \$1.63 million margin, any deterioration of project assumptions would likely result in the project being **unacceptable by SAPC parent viewpoint** standards.
  
- ❖ **Terminal value** is always somewhat controversial for capital budgeting project analysis.
  - Here, the terminal value is calculated as the present value of operating cash flow for the 10 year period from 2007 through 2016 (continuing operations) with a growth rate of **10% per annum**.
  - This may appear **overly aggressive**. If the operating cash flow were **to not grow** during this 10-year period, the project and parent viewpoint results would be:

Under zero growth from 2007 through 2016:

	<u>Project Viewpoint</u>	<u>Parent Viewpoint</u>
NPV	\$33.5	(\$0.5)
IRR	23.9%	17.7%

- ❖ Why might SAPC want to take this risky project?
- ❖ Excerpt two sentences that relate to **real options**. What sort of real options does SAPC see in the BICC project?

---

**CROSS-BORDER CAPITAL BUDGETING & JV**


---

**STRATEGIES BASED ON PROJECT VS. PARENT VIEWPOINT VALUATIONS**

		<b>Parent Viewpoint</b>	
		$NPV^d < 0$	$NPV^d > 0$
<b>Project Viewpoint</b>	$NPV^f < 0$	a) Reject	b) Look for better projects in the foreign currency
	$NPV^f > 0$	c) Lock in the local value in the foreign currency	d) Accept

- a)  $NPV^f < 0$ ,  $NPV^d < 0$ : Clearly, the project should be **rejected** from the perspective of either the parent or a local investor.
- b)  $NPV^f < 0$ ,  $NPV^d > 0$ : Looks attractive to the parent, but likely due to **international financial market disequilibrium**.  
 ⇒ Has nothing to do with project CFs.  
 ⇒ Project is **expected to lose money** in FC  
 (accepting this project is equivalent with speculating on the currency)  
 ⇒ Look for better investment or projects.  
 ❖ For example?
- c)  $NPV^f > 0$ ,  $NPV^d < 0$ : The project is of value to a foreign investor. How can we **capture the positive  $NPV^f$** ?  
 ♦ In the **financial** markets  
 □ Finance the project with **local currency debt or equity**
- ♦ In the **asset** markets  
 □ **Sell** the project to a local investor in the foreign country  
 □ Bring in a **joint venture** partner from the local market  
 ❖ Why might the parent not want to do this?
- d)  $NPV^f > 0$ ,  $NPV^d > 0$ : Clearly, **accept**.

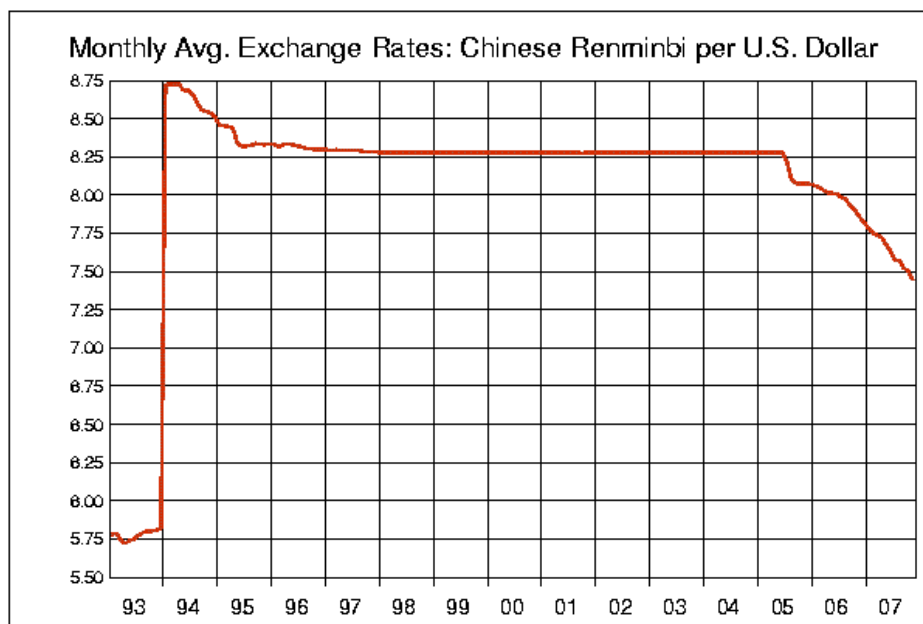
---

**CROSS-BORDER CAPITAL BUDGETING & JV**

---

**CURRENCY RISK**

- Because the project is inherently U.S. dollar based, the problem of foreign exchange was **not explicitly considered**.
- But some revenues/costs may have **renminbi exposure**.
- What would be the effect of **floating renminbi**?
- As of 11/13/2007, Rmb7.422/\$



© 2006 Pacific Exchange Service

**Different Business Models**

- ❖ Sheraton business model—focuses on profitability and building **shareholder wealth**
- ❖ MFA's business model—maximizing **corporate wealth**, that of *all* stakeholders—labor, government, management, the local community, suppliers, creditors as well as shareholders
- ❖ For MFA, **transfer of technology and management know-how** was the underlying reason to invite foreign equity participation.

## CROSS-BORDER CAPITAL BUDGETING & JV

### NPV CALCULATION OF BLOCKED FUNDS

Use the **APV framework** to consider the effect of **blocked funds**.

Suppose:

- Consider an emerging market whose currency is F.
- Operating CFs from years 1 through 3 are F2000, F2200, F2400
- 50% of operating CFs (F1000, F1100, F1200 for years 1 through 3) **blocked by the government with no interest** until the end of year 3
- The spot rate is 1.30\$/F.
- Interest rates: 2% for \$, 5% for F.
- Appropriate discounting rate is 18%

First, compute the NPV **assuming the funds were not blocked**:

Year	0	1	2	3
(a) CF (F)		1000	1100	1200
(b) Spot rate (\$/F)	1.3	1.26	1.23	1.19
(c) CF (\$)		1262.9	1349.5	1430.1
(d) PV factor	1	0.847	0.718	0.609
(e) PV of unblocked funds (\$)		1070	969	870
(f) NPV (\$)		2909.8		

$$(b) \text{ UIRP: } E[S_T] = S_t \left( \frac{1.02}{1.05} \right)^t$$

$$(c) \text{ CF (\$)} = (a) \times (b)$$

$$(d) \text{ PV factor} = 1/1.18^t$$

Next, compute the NPV when the funds are **blocked**: the total cash flow occurs at the end of year 3.

#### (ii) Blocked Funds

Year	0	1	2	3
(g) Blocked CF (F)				3300
(h) PV of unblocked funds (\$)				2393.6
(i) NPV (\$)		2393.6		

$$(h) \text{ PV (\$)} = (g) \times (b) \text{ spot rate} \times (d) \text{ PV factor}$$

**Opportunity cost** of the blocked funds is  $\$2,909.8 - \$2,393.6 = \$516.2$ .

Apply **APV**:

$$\Rightarrow V_{\text{PROJECT WITH SIDE EFFECT}} = V_{\text{PROJECT WITHOUT SIDE EFFECT}} - \$516.2$$

---

**CROSS-BORDER CAPITAL BUDGETING & JV**

---

**PRACTICE PROBLEM SET WITH SOLUTIONS****Cross-border Capital Budgeting**

Set up a spreadsheet and solve the following end-of-chapter problem from *Eiteman, Stonehill & Moffett*. Suggested solutions (in an Excel file) are posted on the Owlspace.

- ❖ Chapter 18, Problem 1 (Sarasota Corporation)
- ❖ Chapter 18, Problem 2 (Trefica de Honduras) Note: “purchasing power parity” in *Eiteman, Stonehill & Moffett* is the “relative purchasing power parity” in *Butler* (and in our course!).