Module 13

MAKING VALUE-CREATING DECISIONS IN AN INTERNATIONAL ENVIRONMENT

Background

- Fundamental principle of corporate finance and the decision criteria examined in previous Modules still hold in an international environment

    - Complications arise due to specific risks attached to cross-border activities

- This Module

    - Examines the impact of currency risk and country risk on management decisions in an international environment

    - Describes the foreign exchange market, the relationships among exchange rates, inflation rates, and interest rates

    - Shows how to apply the NPV rule to a cross-border investment

Background

- **After reading the Module, students should understand**
  - The difference between accounting, or translation, exposure and economic exposure to exchange rate fluctuations
  - How the foreign exchange market operates
  - How to use financial instruments, such as forward, futures, option, and swap contracts, to hedge exchange rate risk
  - The relationships among spot exchange rates, forward exchange rates, interest rates, and inflation rates
  - How to apply the net present value (NPV) rule to investment projects with cash flows denominated in foreign currencies and to projects in a politically or regulatory unstable environment
  - How to actively manage country risk.

The Firm's Risk Exposure From Foreign Operations

- **Foreign exchange risk**
  - Risk associated with the volatility of exchange rates
- **Accounting**, or **translation exposure**
  - The effect of changes in exchange rates on the firm's financial statements
- **Economic exposure**
  - The effect on the firm's cash flows
- **Country risk** or **political risk**
  - The risk of operating in an environment that may not be as politically stable as the domestic one

Accounting, Or Translation, Exposure

- **Accounting exposure**
  - Arises from the need to translate the financial statements of a foreign business unit into the parent company's currency in order to prepare consolidated financial statements
- Most of the many approaches used are variations of the **monetary/nonmonetary method** and the **current method**

Economic Exposure

- Economic exposure focuses on the impact of unexpected changes in exchange rates on the value of the firm's cash flows
  - Classifications
    - **Contractual** (or **transaction)**
      - Effect of exchange rates volatility on the expected cash flows of *past* transactions that are still outstanding
    - **Operating** exposure
      - Concerned with *future* cash flows, originating from future, not past transactions.

Contractual, or Transaction, Exposure

- Measure contractual exposure to a particular currency at a particular date by the net sum of the contractual (future) cash inflows and outflows in that currency at that date
  - Can be controlled using forward, futures, and option contracts

Operating Exposure

- **Operating exposure is more difficult to measure and manage than contractual risk**
    - Excessive exposure can be reduced through diversifying operations and financing sources
    - Using hedging instruments is less efficient in controlling operating exposure

Country, Or Political, Risk

- A firm is exposed to country risk when
  - Unforeseen political events in a country affect the value of the firm's investments in that country
    - Changes in the host country's political environment may bring changes in regulations resulting in restrictions or penalties for foreign operations in the country
- Financial instruments are useless for hedging country risk
  - However, firms can reduce their exposure to country risk following some simple rules
    - Examined later in Module

The Foreign Exchange Market

- **The quoted exchange, or currency, rate**
  - The price that has to be paid in one's country currency to buy one unit of another country's currency
- **The organization of the foreign exchange market**
  - Interbank market
  - Bid-ask spread
  - Cross rates

EXHIBIT 13.1:
Currency Cross Rates on February 3, 1998.

Key Currency Cross Rates Late New York Trading Feb 3, 1998

	Dollar	Pound	SFranc	Guilder	Peso	Yen	Lira	D-Mark	FFranc	CdnDlr
Canada	1.4477	2.3839	.98866	.70896	.17235	.01150	.00081	.79939	.23848	....
France	6.0705	9.9963	4.1457	2.9728	.72268	.04822	.00339	3.3520	....	4.1932
Germany	1.8110	2.9822	1.2368	.88688	.21560	.01438	.00101	....	.29833	1.2509
Italy	1788.8	2945.5	1221.6	875.98	212.95	14.208	....	987.71	294.66	1235.6
Japan	125.9	207.32	85.98	61.655	14.988	....	.07038	69.52	20.74	86.966
Mexico	8.4000	13.832	5.7365	4.1136	....	.06672	.00470	4.6383	1.3837	5.8023
Netherlands	2.0420	3.3626	1.3945	....	.24310	.01622	.00114	1.1276	.33638	1.4105
Switzerland	1.4643	2.4113	....	.71709	.17432	.01163	.00082	.80856	.24122	1.0115
U.K.	.60728	....	.41472	.29739	.07229	.00482	.00034	.33533	.10004	.41948
U.S.	....	1.6467	.68292	.48972	.11905	.00794	.00056	.55218	.16473	.69075

Source: Dow Jones

Source: *The Wall Street Journal,* February 4, 1998.

The Foreign Exchange Market

- Spot transactions versus forward contracts
  - Spot rates
    - A trade between two parties a a rate fixed now
      - Delivery of currencies takes place at a settlement date—usually two business days later
  - Forward rates
    - An agreement between two parties at a rate fixed now
      - Delivery of currencies takes place at a specified future date
        - Usually have maturity of one, three or six months

EXHIBIT 13.2: Spot Rates and Forward Rates on February 3, 1998.

CURRENCY TRADING

EXCHANGE RATES

Tuesday, February 3, 1998

The New York foreign exchange selling rates below apply to trading among banks in amounts of $1 million and more, as quoted at 4 p.m. Eastern time by Dow Jones and other sources. Retail transactions provide fewer units of foreign currency per dollar.

Country	U.S. $ equiv. Tue	Mon	Currency per U.S. $ Tue	Mon
Argentina (Peso)	1.0001	1.0001	.9999	.9999
Australia (Dollar)	.6806	.6866	1.4693	1.4564
Austria (Schilling)	.07799	.07803	12.822	12.815
Bahrain (Dinar)	2.6525	2.6525	.3770	.3770
Belgium (Franc)	.02670	.02658	37.460	37.625
Brazil (Real)	.8896	.8904	1.1241	1.1231
Britain (Pound)	1.6467	1.6390	.6073	.6101
1-month forward	1.6444	1.6366	.6081	.6110
3-months forward	1.6394	1.6316	.6100	.6129
6-months forward	1.6322	1.6245	.6127	.6156
Canada (Dollar)	.6908	.6882	1.4477	1.4530
1-month forward	.6912	.6886	1.4468	1.4522
3-months forward	.6919	.6893	1.4454	1.4508
6-months forward	.6927	.6899	1.4437	1.4494
Chile (Peso)	.002204	.002208	453.65	452.85
China (Renminbi)	.1203	.1208	8.3100	8.2790
Colombia (Peso)	.0007441	.0007452	1343.90	1342.00
Czech. Rep. (Koruna)				
Commercial rate	.02876	.02834	34.773	35.291
Denmark (Krone)	.1450	.1445	6.8960	6.9185
Ecuador (Sucre)				
Floating rate	.0002200	.0002200	4545.00	4545.00
Finland (Markka)	.1818	.1816	5.5001	5.5071
France (Franc)	.1647	.1640	6.0705	6.0965
1-month forward	.1650	.1643	6.0607	6.0867
3-months forward	.1656	.1648	6.0403	6.0663
6-months forward	.1663	.1656	6.0127	6.0381
Germany (Mark)	.5522	.5503	1.8110	1.8173
1-month forward	.5531	.5512	1.8081	1.8143
3-months forward	.5550	.5531	1.8018	1.8081
6-months forward	.5576	.5556	1.7935	1.7997
Greece (Drachma)	.003493	.003486	286.30	286.90
Hong Kong (Dollar)	.1293	.1293	7.7360	7.7360
Hungary (Forint)	.004829	.004791	207.08	208.73
India (Rupee)	.02584	.02571	38.700	38.900
Indonesia (Rupiah)	.00009756	.00009709	10250.00	10300.00
Ireland (Punt)	1.3854	1.3848	.7218	.7221
Israel (Shekel)	.2791	.2791	3.5827	3.5826
Italy (Lira)	.0005590	.0005571	1788.75	1795.00
Japan (Yen)	.007943	.007901	125.90	126.56
1-month forward	.007974	.007933	125.41	126.06
3-months forward	.008042	.008002	124.34	124.97
6-months forward	.008142	.008099	122.82	123.47
Jordan (Dinar)	1.4134	1.4134	.7075	.7075
Kuwait (Dinar)	3.2755	3.2733	.3053	.3055
Lebanon (Pound)	.0006556	.0006555	1525.25	1525.50
Malaysia (Ringgit)	.2540	.2442	3.9363	4.0953
Malta (Lira)	2.5253	2.5221	.3960	.3965
Mexico (Peso)				
Floating rate	.1190	.1189	8.4000	8.4100
Netherland (Guilder)	.4897	.4894	2.0420	2.0434
New Zealand (Dollar)	.5869	.5914	1.7039	1.6909
Norway (Krone)	.1330	.1331	7.5203	7.5148
Pakistan (Rupee)	.02296	.02296	43.560	43.560
Peru (new Sol)	.3609	.3620	2.7711	2.7621
Philippines (Peso)	.02475	.02433	40.400	41.100
Poland (Zloty)	.2832	.2828	3.5305	3.5360
Portugal (Escudo)	.005395	.005391	185.34	185.50
Russia (Ruble) (a)	.1658	.1659	6.0310	6.0290
Saudi Arabia (Riyal)	.2666	.2666	3.7505	3.7506
Singapore (Dollar)	.5956	.5860	1.6790	1.7065
Slovak Rep. (Koruna)	.02827	.02820	35.375	35.455
South Africa (Rand)	.2027	.2029	4.9345	4.9285
South Korea (Won)	.0006325	.0006431	1581.00	1555.00
Spain (Peseta)	.006518	.006498	153.42	153.90
Sweden (Krona)	.1239	.1241	8.0707	8.0564
Switzerland (Franc)	.6829	.6782	1.4643	1.4745
1-month forward	.6853	.6805	1.4592	1.4695
3-months forward	.6903	.6854	1.4486	1.4589
6-months forward	.6975	.6925	1.4337	1.4441
Taiwan (Dollar)	.03022	.02997	33.088	33.370
Thailand (Baht)	.02086	.01967	47.950	50.850
Turkey (Lira)	.00000456	.00000455	219360.00	219690.00
United Arab (Dirham)	.2723	.2723	3.6730	3.6730
Uruguay (New Peso)				
Financial	.1002	.1002	9.9800	9.9800
Venezuela (Bolivar)	.001955	.001955	511.53	511.53
SDR	1.3490	1.3437	.7413	.7442
ECU	1.0893	1.0877		

Special Drawing Rights (SDR) are based on exchange rates for the U.S., German, British, French, and Japanese currencies. Source: International Monetary Fund.

European Currency Unit (ECU) is based on a basket of community currencies.

a-fixing, Moscow Interbank Currency Exchange. Ruble newly-denominated Jan. 1998.

The Wall Street Journal daily foreign exchange data for 1996 and 1997 may be purchased through the Readers' Reference Service (413) 592-3600.

Source: *The Wall Street Journal,* February 4, 1998.

Hedging Contractual Exposure To Currency Risk

- **Hedging with forward contracts**
  - Exchange rate risk can be eliminated by entering a forward contract
- Other techniques
  - **Rolling over a forward contract**
  - Entering a **forward window contract**

Hedging Contractual Exposure To Currency Risk

- **Hedging with futures contracts**
  - **Currency futures contracts**, or **futures** are an alternative to forward contracts in hedging contractual exposure
- **Trading in currency futures contracts**
  - Differs considerably from trading in forward contracts because:
    - Futures contracts are made through a clearing house
    - Currency futures have standard sizes and fixed maturity
    - Futures traders are required to deposit collateral (**margin**)
    - Futures are **marked-to-market** daily
    - The two parties in the futures contract can exit the contract any time during its life

EXHIBIT 13.3: Currency Futures on February 3, 1998.

Source: *The Wall Street Journal*, February 4, 1998.

Hedging Contractual Exposure To Currency Risk

- **The currency futures hedge**
  - A futures hedge has some disadvantages that are not present in a forward hedge
    - More complicated
    - Does not completely eliminate exchange rate risk
    - Requires intermediary cash payments
- However, there are features of the futures market that cause corporations to hedge with futures, rather than with forward contracts
  - For example, a small firm without any established reputation may find it convenient to use futures contracts because no credit check is required

Hedging Contractual Exposure To Currency Risk

- Hedging with option contracts
  - Forward hedge protects a firm from unfavorable exchange rate movements but prevents it from benefiting from favorable changes in the exchange rate
    - Currency option hedges offer a way to achieve both goals
- Currency option contracts
  - Call options
  - Put options
  - European vs. American options
  - Over-the counter options

EXHIBIT 13.4:
Currency Options on November 15, 2000.

Currency (U.K. pound sterling)

Size of the contract

PHILADELPHIA SE £/$ OPTIONS £31,250 (cents per pound)

Strike	********	**CALLS**	********	********	**PUTS**	********
Price	Dec	Jan	Feb	Dec	Jan	Feb
1.420	2.51	3.10	3.84	1.38	1.95	2.64
1.430	1.97	2.56	3.30	1.82	2.32	3.11
1.440	1.50	2.13	2.84	2.37	2.88	3.64

Expiration month

Previous day's vol., Call .5Puts 0 Prev. day's open int., Calls 915 Puts 258

Number of contracts traded

Number of outstanding contracts

Hedging Contractual Exposure To Currency Risk

- **The currency option hedge**
  - Option hedge provides a flexibility that is absent in a forward or futures hedge
    - However, this flexibility comes with a price, which is the price of the option

EXHIBIT 13.5:
Comparison of Currency Option Costs for Four Exchange Rates.

Spot Rate In Three Months' Time FRF/USD	USD/FRF	Exercise Rate USD/FRF	Will the Option Be Exercised?	$ Amount Paid for FRF600,000	Cost of Option	Total Cost
7.25	.1379	.1333	Yes	$80,000	$3,000	$83,000
7.40	.1351	.1333	Yes	$80,000	$3,000	$83,000
7.50	.1333	.1333	No	$80,000	$3,000	$83,000
7.65	.1307	.1333	No	$78,431	$3,000	$81,431

Exhibit 13.5 shows how the cost of a currency option varies with spot exchange rates

EXHIBIT 13.6:
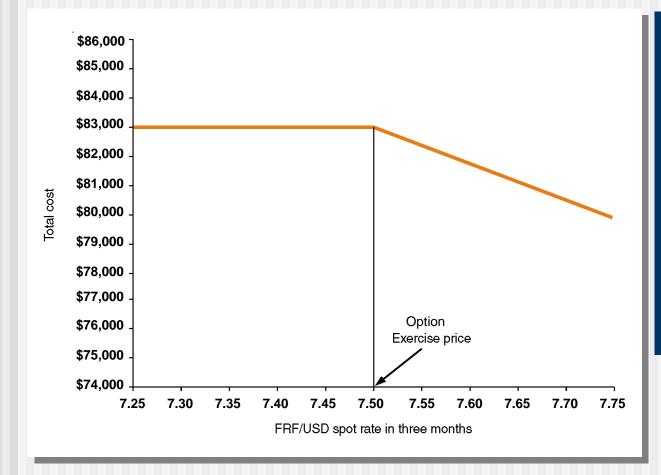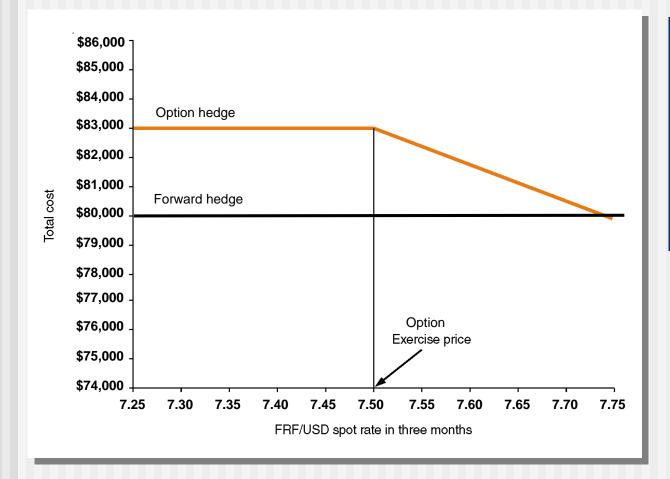# The Option Hedge for the U.S. Champagne Distributor.

Exhibit 13.6 illustrates the net result of the option hedge to the champagne distributor for a wide range of future spot rates. It shows that the hedge accomplishes the dual goal of (1) protecting from downside risk and (2) benefiting from upside potential.

Which Hedging Technique To Choose?

- A hedge is not needed if another business unit belonging to the firm has a currency exposure that is the opposite of the one created by the transaction

- Currency risk exposure can also be reduced using **leading and lagging**
  - Timing the cash inflows and outflows from the firm's different foreign business units to minimize firm's overall exposure to exchange rate risk

EXHIBIT 13.7:
The Forward and Option Hedges for the U.S. Champagne Distributor.

Exhibit 13.7 compares the forward and option hedges for the champagne distributor.

EXHIBIT 13.8:
Corporate Use of Currency Forward, Option, and Futures Contracts in Hedging Currency Risk.

TYPE OF INSTRUMENT	USED OFTEN
Forward contracts	72.3%
Over-the-counter currency options	18.8%
Exchange traded currency options	5.4%
Currency futures contracts	4.1%

Source: Kurt Jesswein, Chuck C.Y. Kwok, and William R. Folks, Jr., "What New Currency Risk Products Are Companies Using and Why?" *Journal of Applied Corporate Finance*, 8, Fall 1995, pages 115–124.

Exhibit 13.8 shows the results of a survey regarding the use of different hedging techniques.

Hedging Long-term Contractual Exposure To Currency Risk With Swaps

- Hedging techniques described in the previous section are most often used to hedge short-term exposure to currency risk

  - To hedge long-term contractual exposure, a firm may prefer to enter a **currency swap contract** with its bank

EXHIBIT 13.9:
Cash Flows for $10 Million Swap Agreement.
Figures in millions

	Initial cash flows		Cash flows: Year 1–4		Cash flows: Year 5	
	USD	SGD	USD	SGD	USD	SGD
1. U.S. dollar loan	+10		–1		–11	
2. Swap agreement	–10	+15	+1	–1.2	+11	–16.2
3. Net cash flow	0	+15	0	–1.2	0	–16.2

Exhibit 13.9 describes the cash flow consequences of a swap agreement. By entering a fixed-for-floating currency swap, most corporate borrowers, who prefer fixed financing costs to variable ones, can easily and cheaply transform their variable financial obligations into fixed ones and, at the same time, reduce their exposure to exchange rate risk.

Exchange Rates And Inflation Rates: The Purchasing Power Parity Relation

- **Purchasing power parity (PPP) relation**
  - Based on the premise that if the price of goods increases faster in one country than another because of the inflation rate is higher in the first country than in the second
    - Then the exchange rate between the two countries should move to offset the difference in inflation rates and consequently, the difference in prices
- Many studies show that the PPP relation usually does a poor job of forecasting spot rates in the near future
  - However, when forecasting long-term exchange rates, no other known forecast appears to be superior to the PPP relation

Inflation Rates And Interest Rates

- **Fisher effect**
  - Relationship between **nominal** and **real interest rates**
- **International Fisher effect**
  - Extension to the relationship between interest differentials and inflation differential
    - Most empirical evidence supports the international Fisher effect
      - Especially between countries with open financial markets

Exchange Rates And Interest Rates: The Interest Rate Parity Relation

- Interest rate parity (IRP) relation
  - Describes how the difference in interest rates between two countries is related to the difference between their forward and spot exchange rates
- Evidence shows that the IRP relation holds in the real world
  - At least for short-term interest rates

Forward Rates And Future Spot Rates

- In equilibrium, the *expected* future spot rate should be equal to the forward rate
  - Empirical evidence for this relation is not clear-cut
  - But despite its failure to properly account for risk, this expression tends to hold *on average*

Putting It All Together

- A good understanding of these relations help avoid classic mistakes, such as
  - Trying to increase profit from operations by buying currencies when they go down and selling them when they go up
    - The only time it works is when the change in the exchange rate is higher than the difference between the interest rates

Exhibit 13.10
The Fundamental Relationships Among Spot Exchange Rates, Forward Exchange Rates, Inflation Rates, and Interest Rates

The relation	What does it say?	The simplified version of the relation
Purchase Power Parity (PPP)	Spot exchange rates adjust to keep the cost of living the same across countries. As a consequence, the expected percentage change in the spot rate is equal to the difference in the expected inflation rates between the two countries.	$$\frac{E\left(S_{h/f}^1\right) - S_{h/f}^0}{S_{h/f}^0} = E(i_h) - E(i_f)$$ Equation 13.2
International Fisher Effect	The difference in interest rates between two countries is equal to the different in their expected inflation rates.	$$r_h - r_f = E(i_h) - E(i_f)$$ Equation 13.7
Interest Rate Parity	The percentage difference between the forward and spot exchange rates is equal to the difference in the interest rates between the two countries.	$$\frac{F_{h/f}^0 - S_{h/f}^0}{S_{h/f}^0} = r_h - r_f$$ Equation 13.9
Expected Spot Rate and Forward Rate	The percentage difference between the forward rate and the spot rate is equal to the percentage difference between the expected spot rate and the current spot rate.	$$\frac{F_{h/f}^0 - S_{h/f}^0}{S_{h/f}^0} = \frac{E\left(S_{h/f}^1\right) - S_{h/f}^0}{S_{h/f}^0}$$ Equation 13.11

Analyzing An International Investment Project

- The section provides a review of the net present value rule

    - Consider Surf'n Zap, a firm that wants to export its remote control device to Europe and has to decide where to locate its regional distribution center–in Switzerland or Zaragu

- The net present value rule: a brief review

    - NPV rule is the relevant investment rule, even in the case of a cross-border investment

EXHIBIT 13.11:
The Zap Scan Project.
Cash flows in millions

	SWITZERLAND ALTERNATIVE IN SWISS FRANCS (CHF)	ZARAGU ALTERNATIVE IN ZARAGUPA (ZGU)
Initial cash outlay	25.0	230
Annual cash flows		
Year 1	5.3	50
Year 2	5.8	60
Year 3	6.0	65
Year 4	6.1	70
Year 5	6.2	75
Liquidation value in year 5	20.0	250
Current annual inflation rate	2%	10%
Current spot exchange rate	CHF/USD1.8	ZGU/USD10

Exhibit 13.11 presents the annual cash flows *net of all local and U.S. taxes* for the two alternative locations of the Surf's 'n Zap project, Switzerland or Zaragu.

Analyzing An International Investment Project

- **The NPV of the Swiss alternative**
  - U.S. dollar value of the project's expected future cash flows is estimated
    - Then, these cash flows are discounted at the project's cost of capital
- Purchasing power parity relation is used to estimate the year-end spot exchange rates for the next five years, using the expected inflation rates
  - Results of this analysis are shown in **Exhibit 13.12**

EXHIBIT 13.12a:
The Zap Scan Project's Expected Cash Flows from the Swiss Alternative.

	INITIAL	END OF YEAR 1	END OF YEAR 2	END OF YEAR 3	END OF YEAR 4	END OF YEAR 5
		Expected cash flows in millions of Swiss francs (CHF)				
Annual cash flow	(25.0)	5.3	5.8	6.0	6.1	6.2
Cash flow from liquidation						20.0
Total cash flow	(25.0)	5.3	5.8	6.0	6.1	26.2
		Estimation of the USD/CHF spot rate using PPP (Equation 13.1)				
Swiss expected inflation rate		2%	2%	2%	2%	2%
United States expected inflation rate		3%	3%	3%	3%	3%
Current exchange rate: USD/CHF	0.5555					
Expected future spot rate: USD/CHF		0.5609	0.5664	0.5720	0.5776	0.5832

EXHIBIT 13.12b:
The Zap Scan Project's Expected Cash Flows from the Swiss Alternative.

	INITIAL	END OF YEAR 1	END OF YEAR 2	END OF YEAR 3	END OF YEAR 4	END OF YEAR 5
		Expected cash flows in millions of U.S. dollars (USD)				
Total cash flow in USD	(13.888))	2.973	3.285	3.432	3.523	15.280

Net Present Value at 10% = USD6.002 million

Analyzing An International Investment Project

- **The NPV of the Zaragu alternative**
  - Procedure for estimating the expected value of the Zaragu project's cash flows without accounting for country risk is the same as for the Swiss alternative (**Exhibit 13.13**)

- Any adjustment for country risk be made on the project's *expected cash flows* rather than on the cost of capital

EXHIBIT 13.13a:
The Zap Scan Project's Expected Cash Flows for the Zaragu Alternative without Country Risk.

	INITIAL	END OF YEAR 1	END OF YEAR 2	END OF YEAR 3	END OF YEAR 4	END OF YEAR 5
Expected cash flows in millions of zaragupas (ZGU)						
Annual cash flow in ZGU	(230)	50	60	65	70	75
Cash flow from liquidation in ZGU						250
Total cash flow in ZGU	(230)	50	60	65	70	325
Estimation of the USD/ZGU spot rate using PPP (Equation 13.1)						
Zaragu expected inflation rate		10%	10%	10%	10%	10%
U.S. expected inflation rate		3%	3%	3%	3%	3%
Current exchange rate: USD/ZGU	0.1000					
Expected future spot rate: USD/ZGU		0.0936	0.0877	0.0821	0.0769	0.0720

EXHIBIT 13.13b:
The Zap Scan Project's Expected Cash Flows for the Zaragu Alternative Without Country Risk.

	INITIAL	END OF YEAR 1	END OF YEAR 2	END OF YEAR 3	END OF YEAR 4	END OF YEAR 5
		Expected cash flows in millions of U.S. dollars (USD)				
Total cash flow in USD	(23)	4.680	5.262	5.336	5.383	23.400

Net Present Value at 10% = USD7.818 million

EXHIBIT 13.14a:
The Zap Scan Project's Expected Cash Flows for the Zaragu Alternative with Country Risk.

	INITIAL	END OF YEAR 1	END OF YEAR 2	END OF YEAR 3	END OF YEAR 4	END OF YEAR 5
Expected cash flows in the absence of a "foreign" tax on the projects earnings, in millions of zaragupas (ZGU)						
Annual cash flow in ZGU	(230)	50	60	65	70	75
Cash flow from liquidation						250
Total cash flow	(230)	50	60	65	70	325
Expected operating cash flows in the presence of a "foreign" tax on the projects earnings, in millions of zaragupas (ZGU)						
Project's earnings (90% of cash flow) in ZGU		45.000	54.000	58.500	63.000	67.500
"Foreign" Tax (25% of earnings) in ZGU		(11.250)	(13.500)	(14.625)	(15.750)	(16.875)
Annual operating cash flow net of tax in ZGU	(230)	38.750	46.500	50.375	54.250	58.125

EXHIBIT 13.14b:
The Zap Scan Project's Expected Cash Flows for the Zaragu Alternative with Country Risk.

	INITIAL	END OF YEAR 1	END OF YEAR 2	END OF YEAR 3	END OF YEAR 4	END OF YEAR 5
Expected cash flows in millions of zaragupas (ZGU)						
Probability that the earnings will be taxed		20%	20%	20%	20%	20%
Annual operating cash flow in ZGU	(230)	47.750	57.300	62.075	66.850	71.625
Cash flow from liquidation						250
Total cash flow	(230)	47.750	57.300	62.075	66.850	321.625
Expected cash flows in millions of U.S. dollars (USD)						
Expected spot rate USD/ZGU	0.1	0.0936	0.0877	0.0821	0.0769	0.0720
Total cash flow in USD	(23)	4.471	5.024	5.096	5.139	23.151
Net Present Value at 10% = USD6.930 million						

EXHIBIT 13.15:
The Zap Scan Project's Net Present Value (NPV) for the Zaragu Alternative as a Function of the Probability of the Project being Subjected to the "Foreign" Tax.

Probability that the project will be subjected to the "foreign" tax	0%	10%	20%	30%	40%	50%
Project NPV in USD millions	7.814	7.373	6.930	6.489	6.047	5.605

Exhibit 13.15 shows how sensitive the NPV of the project is to changes in the probability of the project being subject to a "foreign" tax. We argue that the only way to improve confidence in the NPV of a cross-border project is to do a *sensitivity analysis* of the project's NPV to changes in assumptions underlying the computations. For example, scenarios can be developed using deviations from PPP combined with different forms of expropriations from the country in which the project would be located.

Managing Country Risk

- **Actions that can help a manager design a proactive strategy for managing country risk**
  - Invest in projects with unique features
    - Projects that cannot be easily replicated are less likely to be expropriated than those which can be
      - Unique features include
        - Expertise unique to the parent company
        - When the parent company controls the project input or output
  - Use local sourcing
    - Buying goods and services locally can reduce political risk
      - Increases local production and local employment

Managing Country Risk

- **Choose a low-risk financial strategy**
  - Country risk can be substantially reduced if the host country government, local entrepreneurs or a powerful international investor is included as a minority shareholder or lender
  - Also preferable to finance a cross-border investment with as little equity as possible
- **Design a remittance strategy**
  - Dividends or interest payments can be complemented by royalties, management fees, transfer prices, and technical assistance fees
- **Consider buying insurance against political risk**
  - Even if the insurance is not purchased, the insurance premium can be used to estimate the impact of political risk on the NPV of the cross-border investment