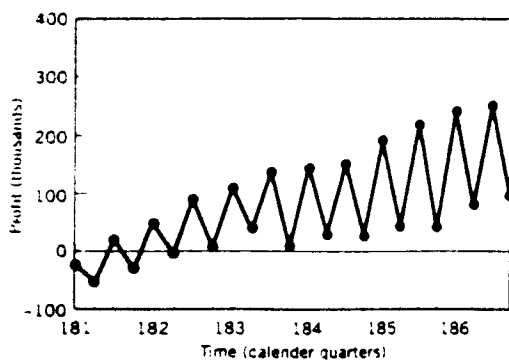


EXHIBIT 15-5

**World Tours Inc.: Raw Historical Profit—
No Hedge**



1990, the firm's management began to consider issuing debt in an effort to increase leverage. Its underwriters suggested that WTI could sell its debt at a lower coupon if it reduced its quarterly profit volatility. Management believed that shareholders would also prefer greater profit stability. In order to remove some of the volatility from profit, management sought to identify the sources of the firm's profit volatility and then to reduce the volatility by properly structured swaps.

Since sales had been growing over the years, management believed that there was a secular trend to sales which was explained by its increasing expenditures on advertising and customers word-of-mouth endorsements. Management also noted that recorded revenues tended to rise in the first quarter (explained by the popularity of its winter ski tours) and in the third quarter (explained by the popularity of its summer tours). Management suspected that sales may also be a function of the strength of its domestic currency, vis-à-vis European currencies. Management decided to measure the strength of its domestic currency relative to an index of European currencies that we will call the European Currency Index (ECI). The ECI values for the same 24 quarters are reported in Exhibit 15-6. Management also believed that sales revenue exhibits a significant random component.

A statistical decomposition of the revenue history confirmed the trend and seasonal components of WTI's business. It also revealed the link between WTI's revenue and the strength of its domestic currency. There was a random component to revenue but this proved considerably less important than originally believed. Specifically, the decomposition revealed the following relation between revenue and the various revenue components:

EXHIBIT 15-6

ECI / DOMESTIC EXCHANGE RATE

Quarter	Rate	Quarter	Rate	Quarter	Rate
185	2.040	187	1.874	189	1.605
285	2.111	287	1.924	289	1.518
385	2.103	387	1.856	389	1.586
485	1.989	487	1.614	489	1.504
186	2.022	188	1.663	190	1.528
286	2.026	288	1.671	290	1.497
386	2.033	388	1.568	390	1.463
486	1.899	488	1.570	490	1.558

$$\text{Revenue} = \text{Trend} + \text{Seasonal} + \text{ECI Factor} - \text{Random}$$

$$\text{Trend} = 1200 + (200 \times \text{Period})$$

$$\text{Seasonal} = 0.2 \times D \times \text{Trend}$$

$$\text{ECI Factor} = 0.6 \times (\text{ER} - 2.000) \times \text{Trend}$$

where

Period: Quarter number
(1 through 24)

D: Seasonal dummy
= +1 for quarters 1 and 3
= -1 for quarters 2 and 4

ER: Exchange rate of ECI
for domestic currency

V: The Assignment

As already noted, management has concluded that it would like to deseason the firm's cash flows and remove the exchange rate risk associated with its operations. Based on the description of swaps provided in the tutorial and the specific decomposition of the firm's profit history provided above, answer the following questions. (Note: an electronic spreadsheet will be of considerable aid in designing your solutions and graphing your results.)

1. Based on the analysis of the firm's profit history described above, design a fixed-for-fixed interest rate swap with mismatched payment dates that would deseason WTI's cash flows. Be sure to take account of growth in the firm's profits when structuring the notional principals. Assume that the fixed rate on both sides of the swap is 10 percent semiannual (sa).
2. Assuming that this swap could be retroactively applied, generate the quarterly cash flows on the swap for WTI. Use a spreadsheet for this part of the analysis.
3. Now, combine the quarterly cash flows on the swap with WTI's quarterly profits, and graph the combined outcomes using the same graphical form as that depicted in Exhibit 15-4. Comment on the effect of the swap on quarterly profit volatility.

4. Why could this swap be accurately described as an "accreting fixed-for-fixed interest rate swap"?
5. Again assuming that a swap could be retroactively applied, design a currency swap, based on the ECI and the firm's domestic currency unit (DCU), that would allow the firm to hedge its exchange rate exposure. Be sure to take account of the growth in profits over time. Assume that the swap would employ an ECI/DCU exchange rate of 2:1.
6. Using a spreadsheet, generate the quarterly cash flows associated with the currency swap that you have designed. Combine these cash flows with the combined profits from the firm's operations and the cash management swap obtained in item 3 and graph the newly combined cash flows. Comment on the effect of the currency swap on the firm's profit volatility and performance.
7. Consider one last time the fixed-for-fixed accreting interest rate swap you developed in item 1. If both legs of the swap pay 10 percent, as we assumed, do the two sides of the swap necessarily have the same present value? If not, how can the swap be adjusted to equate the present values of the two sides of the swap? Assuming that you equate the present values by adjusting the dealer-pays-fixed rate (holding the WTI-pays-fixed rate constant at 10 percent), what rate must the dealer pay to equate the present values?
8. The fixed-for-fixed accreting interest rate swap that you developed in item 1, and which you adjusted in item 8, does not afford any profit for the swap dealer since the present values of both legs are the same. What additional adjustment needs to be made to compensate the dealer? Briefly discuss.