

## Corporate Finance, Module 4, "Net Present Value vs Other Valuation Models"

### *Intuition: Forecasted Cash Flows vs Sunk Costs*

(The attached PDF file has better formatting.)

The second of the three points to remember about NPV (page 93) is: "NPV depends solely on the forecasted cash flows and the opportunity cost of capital." At the moment that cash is transferred (if it cannot be recouped), a forecasted cash flow becomes a sunk cost.

*Illustration:* Buying a house has many steps: You give a \$500 deposit to the broker when making an offer, you pay \$600 to hire a termite inspector, and so forth. Some buyers, who initially feel the purchase is a good deal, are less happy each time they pay cash, thinking that the purchase becomes a poorer deal as they continue spending. But the opposite is true: Each time you pay cash that can not be recouped, the net present value of the house (to you) increases.

*Question:* The value of the house depends on the attributes of the house. The value does not vary if you pay a termite inspector, so its present value does not vary. What do you mean?

*Answer:* The present value of the house, which is the present value of the future cash inflows, does not vary. But the *net present value* of the house is the present value minus the required investment (the *future* cash out-flows). You must have a termite inspection, which will cost \$600. Before the inspection, this is a future cash flow, which reduces the net present value. After the inspection, this is a sunk cost.

Suppose the present value of the future cash inflows from the house is \$200,000, and the total cost, including brokers fees, termite inspection, and all else, is \$210,000. The net present value of the house is  $-\$10,000$ . When you pay the \$500 broker's deposit, the net present value rises to  $-\$9,500$ ; when you pay the termite inspector, the net present value rises to  $-\$8,900$ . When you have finished closing on the house and have paid out \$20,000, the net present value is  $+\$10,000$ .

*Illustration:* Suppose you plan a one-year trip to France to work for a reinsurer. You buy a \$2,000 round-trip ticket: Chicago  $\rightarrow$  Paris on January 1, 20X7, and Paris  $\rightarrow$  Chicago on December 31, 20X7. The ticket is non-refundable.

On December 1, 20X7, the French reinsurer offers to extend your visit for a second year, but the airline will not extend the ticket for a second year. You have two choices:

1. Fly back to Chicago on December 31, 20X7; buy another \$2,000 round trip ticket for Chicago  $\rightarrow$  Paris on January 10, 20X8, and Paris  $\rightarrow$  Chicago on December 31, 20X8.
2. Let the return half of the round trip ticket expire; buy a \$1,000 one-way ticket Paris  $\rightarrow$  Chicago for December 31, 20X8.

Many persons pick the first choice, even if they have no interest in coming back to Chicago for ten days, since the second choice has a loss of \$1,000 when the return half of the first round trip ticket expires. They think: "Unless I use the return ticket, I lose its value."

They reason as follows: the value of the return ticket is \$1,000 before December 31. After December 31, its value is zero, so letting it expire costs \$1,000. The second round trip ticket has a market value of \$2,000, so there is no loss in buying the second ticket.

Brealey and Myers say *no*: sunk costs are irrelevant to decisions. The first choice costs \$1,000 more. Unless the trip to Chicago is worth \$1,000, the second choice is preferred.

*Question:* What is wrong with the traveler's reasoning you summarize above?

*Answer:* The value is the resale value of the ticket, not how much it cost to buy the ticket last year. Since the ticket is not negotiable (can't be sold to others) and not refundable, its resale value is zero. The value to you is how much you would pay to get these tickets now.