

PENSACOLA SURGERY CENTERS

TIME VALUE ANALYSIS

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GARY HUDSON was born and raised in Pensacola, Florida. He obtained his bachelor's degree in business from Florida State University, where he enrolled in the NROTC program, and, after graduation, he received a commission in the U.S. Marine Corps. After his release from active duty, Gary used his GI Bill benefits to obtain a master's degree in health services administration from the University of Florida. His first job in healthcare was as a special projects coordinator/financial analyst at a large Miami hospital. He enjoyed his work there, but his ultimate goal was to return to Pensacola as the manager of a smaller healthcare business, where he would have more responsibility and authority. After five years in Miami, Gary became the chief operating and financial officer of Pensacola Surgery Centers, an investor-owned chain of ambulatory surgery centers with six locations in the panhandle area of Florida.

Immediately after assuming his new position, Gary found himself facing several decisions. First, the company currently has \$100,000 in its cash account, but its target cash balance is only \$50,000. Thus, Gary wants to temporarily invest the excess \$50,000 in marketable securities, which typically consist of low-risk, short-term securities, such as Treasury bills or money market mutual funds. One alternative Gary is considering is to invest the \$50,000 in a bank certificate of deposit (CD). CDs are generally available in maturities from six months to ten years, and interest can be handled in one of two ways: the investor

(buyer) can receive periodic interest payments or the interest can automatically be reinvested in the CD. In the latter case, the buyer receives no interest during the life of the CD but receives the accumulated interest plus principal amount at maturity. Because the goal of this investment is to accumulate funds for future use, as opposed to generate current income, all interest earned on the CD will be reinvested.

Second, the company recently bought a new hardware/software system to handle its patient billings. However, the current system obviously will have to be replaced with a more sophisticated system in about five years. After making some inquiries to potential vendors, Gary estimated the future cost of the new system to be \$200,000. To ensure that the funds are available to make this purchase, Gary is planning either to deposit a lump sum today in an interest-bearing account or to make annual payments into the same account.

Third, Pensacola Surgery Centers has some extra space at one of its locations that it might lease out for five years. The initial renovation cost, which includes new flooring and lighting as well as a new outside entrance, is estimated to be \$40,000. Because of some unusual terms in the proposed lease contract, and also because of a promise to add more computer ports in three years, the net cash inflows expected from the lease follow this uneven pattern:

<i>End of Year</i>	<i>Net Cash Flow</i>
1	\$ 12,000
2	14,000
3	2,000
4	16,000
5	20,000

The decisions that Gary faces all involve time value analysis. As a check on your skills, see if you can answer the following relevant questions:

1. Consider the \$50,000 excess cash. Assume that Gary invests the funds in a one-year CD.
 - a. What is the CD's value at maturity (future value) if it pays 10 percent (annual) interest?

- b. What will its future value be if the CD pays 5 percent interest? If it pays 15 percent interest?
 - c. BankSouth offers CDs with 10 percent nominal (stated) interest, but compounded semiannually. What is the effective annual rate on this CD? What will the future value be after one year if \$50,000 were invested?
 - d. The Pensacola branch of Bank of America offers a 10 percent CD with daily compounding. What are the CD's effective annual rate and its value at maturity one year from now if \$50,000 is invested? (Assume a 365-day year.)
 - e. What stated rate will BankSouth have to offer to make its semiannual-compounding CD competitive with Bank of America's daily-compounding CD?
- 2. Rework Parts a through d of Question 1 assuming that each CD has a five-year maturity.
 - 3. Now consider the surgery centers' goal of having \$200,000 available in five years to buy a new patient billing system.
 - a. What lump sum amount must be invested today in a CD paying 10 percent annual interest to accumulate the needed \$200,000?
 - b. What annual interest rate is needed to produce \$200,000 after five years if only \$100,000 is invested?
 - 4. Now consider a second alternative for accumulating funds to buy the new billing system. In lieu of a lump sum investment, assume that five annual payments of \$32,000 are made at the end of each year.
 - a. What type of annuity is this?
 - b. What is the present value of this annuity if the opportunity cost rate is 10 percent annually? 10 percent compounded semiannually?
 - c. What is the future value of this annuity if the payments are invested in an account that pays 10 percent interest annually? 10 percent compounded semiannually?

- d. What annual interest rate is required to accumulate the \$200,000 needed to make the purchase, assuming a \$32,000 annual payment?
 - e. What size annual payment is needed to accumulate \$200,000 under annual compounding at a 10 percent interest rate?
 - f. Suppose the payments are only \$16,000 each, but they are made every six months, starting six months from now. What will the future value be if the ten payments were invested at 10 percent annual interest? If invested at BankSouth at 10 percent compounded semiannually?
5. Assume now that the payments are made at the beginning of each period. Repeat the analysis in Question 4.
6. Now consider the uneven cash flow stream stemming from the lease agreement given in the case.
- a. What is the present (Year 0) value of the annual lease cash flows if the opportunity cost rate is 10 percent annually?
 - b. What is the future value of this cash flow stream at the end of Year 5 if the cash flows are invested at 10 percent annually? What is the present value of this future value when discounted at 10 percent? What does this result indicate about the consistency inherent in time value analyses?
 - c. Does the office renovation and subsequent lease agreement appear to be a good investment for the company? (Hint: Compare the cost of renovation with the present value of the lease payments. Use a 10 percent discount rate for the analysis.)
7. Now assume that it is five years later and the company is unable to accumulate the \$200,000 needed to make the software purchase. Instead, it is forced to borrow the \$200,000. The loan calls for repayment in equal annual installments over a four-year period, with the first payment due at the end of one year. Assuming that the company can borrow the funds at a 10 percent rate, what amount of interest and principal will be repaid at the end of each year of the loan?

8. Throughout this case, you have been either discounting or compounding cash flows. Many financial analyses, such as bond refunding decisions, capital investment decisions, and lease decisions, involve discounting projected future cash flows. What is the appropriate rate in such situations? What factors influence the value of this rate?