

# Planners solve many different problems

"Can you tell me where to put my money so it would grow rapidly?" is a question most often faced by financial planners. Few people realize, however, that a competent financial planner can solve many different types of financial problems. Here is the technique to solve two of the many types of problems routinely faced.

## The basic tools

Most problems require the use of the following tools:

**PMT:** Periodic payment, typically monthly payments, although an investor may make a one time lump sum investment.

**CV:** Compound value. This is the future value of a fixed sum invested today.

**CVA:** Compound value of an annuity. An investor who invests funds on an annual basis may wish to determine the total value at the end of a given period.

**CVAF:** Compound value annuity factor. Financial tables provide this value for easy problem solving.

**PV:** Present value. This is today's value of an amount to be received in the future.

**PVA:** Present value of an annuity. Frequently people want to know what is today's value of the incomes they expect to receive over the several years.

**PVAF:** Present value annuity factor. Financial tables provide this value.

**PVIP:** Present value interest factor.



## finances and you

**Sid Mitra**

### Problem I

A young executive named Sam Dunn wants to engage in long-term financial planning. He wants to invest \$5,000 per year at an effective annual rate of return (EAR) of 9 percent per year for the next 30 years, with the first deposit beginning at the end of the year. Beginning at age 60 he will tour around the world for five years, and he will need a large sum each year to accomplish that objective. After Sam completes this tour, he would like to receive an annual income of \$30,000 per year for the next 15 years. Assuming an EAR of 9 percent for the entire time period, what is the maximum amount of capital Sam can spend on his world tour?

This problem should be broken down into four steps.

#### Step 1

$$CVA = PMT \times CVAF$$

$$= \$5,000 \times 136.30754$$

$$= \$681,537.70$$

Sam will have accumulated \$681,537.70 by age 60.

#### Step 2

The PV of \$30,000 annual pay-

ments for 15 years, starting with year 36 (age 65) is:

$$PVA = PMT \times PVAF$$

$$= \$30,000 \times 8.06069$$

$$= \$2,418,207.70$$

#### Step 3

The PV of \$241,820.70 at age 60, discounted for 5 years, is:

$$PV = CV \times PVIF$$

$$= \$241,820.70 \times .6499315$$

$$= \$157,166.90$$

#### Step 4

Therefore, Sam should be able to spend the difference between what he would have at age 60 and the amount he would need to generate current income starting with age 65. Specifically,

Amount accumulated by age 60 = \$681,537.70  
 Amount needed to generate income at age 65 = \$157,166.90  
 Amount available for world trip = \$524,370.80

### Problem II

One of the most challenging problems faced by a financial planner is

the calculation of the present value of a common stock. The stock is attractive only if it is undervalued; that is, the present value exceeds its current market price.

Consider the following example. The Martin Company is currently paying an annual dividend of \$2 per share. Dividends are expected to grow at an impressive rate of 14 percent during the next five years, and thereafter at the rate of 3 percent a year. The rate of discounting is 12 percent. What is the present value of Martin stock?

Thus, Martin stock is undervalued if it is selling for less than \$35 per share.

### Solution II

This problem requires a four-step solution

#### Step 1

Calculate the PV of the stock during the period when the dividends will grow at 14 percent:

Year	Divs	PVIF	PV
1	\$2.28	.893	\$2.04
2	2.60	.797	2.07
3	2.96	.712	2.11
4	3.37	.636	2.14
5	3.85	.567	2.18
			\$10.54

#### Step 2

Calculate the PV of Martin stock

with dividends growing at 3 percent per year from year 6 until infinity:

$$PV(\text{Year } 5) = D_5 + r_g$$

where  $r_g$  = growth rate of dividend at 3%

$$PV = \$3.85 + (.12 - .03)$$

$$= \$44.08$$

#### Step 3

PV of Martin stock (\$44.08) at the end of 5 years should be converted into PV of the stock today:

$$PV(\text{today}) = PV(\text{Year } 5) + (1 + .12)^5$$

$$= \$44.08567$$

$$= \$44.98$$

#### Step 4

PV of Martin stock is the sum of PVs arrived at in Steps 1 and 3:

$$PV = \$10.54 + \$44.98$$

$$= \$55.52$$

Thus, Martin stock is undervalued if it is selling for less than \$35 per share.

This article may not help you solve your financial problems. But I hope that it will help you select the right financial planner for you.

Sid Mitra is a professor of management at Oakland University and proprietor of Coordinated Financial Planning.

## datebook

**WOMEN'S NETWORK**  
 Monday, Aug. 8 — "Women and Self Defense" will be the topic of a representative of Citizens Against Crime at the August meeting of the Michigan Professional Women's Network at 6 p.m. at the Southfield-Radisson. Non-member fee: \$23. Information: Diane Wilbur, 647-4480.

**MARKETING PROFESSIONALS**  
 Friday, Aug. 12 — "Modern Persuasion Strategies for Sales and Marketing" will be presented 10:11:30 a.m. at the Radisson Plaza Hotel in Southfield. Non-member fee: \$45. Information: Diane Ohman, 984-3000.

**CAD/CAM ROBOTICS**  
 Sunday-Wednesday, Aug. 14-17 — Third International conference on CAD/CAM Robotics and Factories of the Future held in Southfield. Information: Prakash Shrivastava, 986-2206. Sponsors: International Society for Productivity Enhancement, Society of Automotive Engineers.

**GRE PREPARATION**  
 Saturdays, Sept. 10 through Oct. 1 — Graduate Records Examination preparation workshops offered beginning at 9 a.m. in Rochester. Fee: \$125. Optional math refresher: \$45. Information: 370-3120.

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