# Vegetable and mountain states potato

ASSIGN BUSTER

Savings deposits at a bank contain very little risk if they are insured by FDIC. Treasury bills offer a narrow range of potential risk. Small-company common stocks typically offer a large range of possible returns, from negative to positive, and so involve much more risk. Financial advisors like to classify their investors according to their preference or aversion to risk. A risk-taker prefers to gamble and may accept a low rate of return in exchange for a chance at a large return. Risk-neutral investors are indifferent with respect to investment risk.

Finally, risk-averse investors prefer to " leave their money under the mattress. " They don't like risk and demand a high rate of return for any risk undertaken. When an investment has an uncertain return, it can often be described using a discrete random variable. For example, based on past experience, the return for investment A is described according to the following probability distribution: X = Return for Investment A ? ? ? ? ? ?? ? ? ? ? = $1000 with probability . 3 $500 with probability . 1 $200 with probability . 1 $100 with probability . $0 with probability . 1 - $100 with probability . 2 X The mean of this random variable, called the expected return, is equal to (-100)(. 2) + (0)(. 1) + (100)(. 2) + (200)(. 1) + (500)(. 1) + (1000)(. 3) = $370 However, if you were to examine the return on this investment, you would observe considerable variation: that is, this investment contains a great deal of risk. This can be measured using the standard deviation of X. The variance of X is equal to (-100)2(. 2) + (0)2(. 1) + (100)2(. 2) + (200)2(. 1) + (500)2(. 1) + (1000)2(. ) – (370)2 = 196, 100 and the standard deviation is 196, 100 = $442. 8. The returns for three investments are illustrated in the Figure given at the end of the case.

Investment A, the one just described, has the largest expected return but also the largest amount of risk. Investment B has a smaller expected return than A and also involves less risk. Investment C has the smallest expected return and the least risk. Investment A is characteristic of common stock returns. B resembles long-term corporate bonds, and C is like the return from U. S. treasury bills.

The attractiveness of each of these investments depends to a great extent on you willingness to assume a larger amount of risk in exchange for a larger expected return. The risk-averse investor would likely prefer investment C, and the risk-seeking individual would opt for investment A. [9] A group of local investor decided to use this strategy in comparing the price earnings (P/E) ratios for two different groups of investments: The Banking Industry and the Health Care Industry. Data were collected from the Corporate Scoreboard contained in the March 2, 1994, edition of Business Week.

The Scoreboard contained P/E ratios for 55 U. S. banks and 49 companies under the Health Care category (including subcategories of drug distribution, drugs and research, health care services, ad medical products). To reduce the effect of any outliers, it was decided to eliminate the smallest and the largest ratio from each of the two groups. The resulting relative frequency distributions can be considered probability distributions describing the P/E ratios for each of the two industry types. Banking Industry P/E Ratio: 7 8 9 10 11 12 13 14 16 18 Frequency: 2 2 12 16 8 5 3 2 1 2 HEALTH CARE INDUSTRY

P/E Ratio: 10 11 12 13 14 15 16 17 18 19 20 21 Frequency: 1 1 1 5 3 3 4 4 1 2 3 2 P/E Ratio: 22 23 24 25 27 29 30 31 34 37 43 Frequency: 1 2 2 1 2 2 2 1

2 1 1 Source: Corporate Scoreboard, Business Week, March 7, 1994, pp. 111-118. QUESTIONS 1. Construct a probability distribution for each of the industry types using the relative frequencies. 2. Using the information from question 1, construct the probability histograms (similar to Figure given at the end of the case) and discuss their shape. 3. What is the probability that a P/E ratio is larger than 12 for each industry type? 4.

If you were a risk-seeker, which industry type would you find more attractive? If you were a risk-avoider? 5. What can you tell this investment group about the expected payoff and risk for each industry type? [10] 0 0. 1 0. 2 0. 3 Probability -100 0 100 200 300 400 500 600 700 800 900 1000 Return INVESTMENT A (? = $370, ? = $442. 8) 0 0. 1 0. 2 0. 3 Probability -100 0 100 200 300 400 500 600 700 800 900 1000 Return INVESTMENT B (? = $240, ? = $120. 0) 0 0. 1 0. 2 0. 3 0. 4 0. 5 Probability -100 0 100 200 300 400 500 600 700 800 900 1000 Return INVESTMENT c (? = $210, ? = $70. 0) [11] CUTCRAFT CUTLERY CORPORATION

Cutcraft is one of the world’s leading cutlery manufacturing firms. Its modern plant is nestled in the Great Smokey Mountains foothills of southwestern Virginia. In the late 1800s a group of craftsmen skilled in the art of knife making settled there and began the area’s tradition of fine cutlery. And at Cutcraft, this tradition continues today. In 1948 W. C. Grace and Sons, a large direct selling organization, and Cutcraft joined forces to sell the fine cutlery products. Today, Cutcraft is a dominant force in direct sales. Its knives are distributed by over 70, 000 sales people worldwide.

And at today’s current prices, Cutcraft has sold over $400, 000, 000 worth of product to over 2, 750, 000 satisfied customers around the world. Cutcraft’s commitment has always been, and continues to be, to provide the customer with a quality piece of cutlery, with service to stand behind the product if anything should go wrong. The merit of this philosophy is evidenced by ongoing customer satisfaction and the increased demand for Cutcraft over the years. In fact, in the last sixteen years the company had never experienced a downturn in sales, that is, until the middle of last year.

Around the end of July, things began to soften up. Nothing serious, just a slight erosion of 25 percent annual growth rate the company enjoyed for the first six months of the year. Throughout the fall, normally a strong selling season, the trend worsened to the point that sales for the last quarter were virtually flat when compared with those of the same period in the prior year. At this point, the vice-president of sales was considering a new training program as a way of turning around the sales decline. He discussed his prospective program with other top executives, and he received ery positive reactions to what he wanted to do. So he instituted for prospective sales people his new form of sales training. Previous data indicated that the average number of sales per month for those who did not participate in the new program was 41. Management was interested in determining whether the new training program was effective or not. The vice-president, to satisfy the wishes of the top executives, decided to take a random sample of 50 new employees and give them the new sales training program and then send them out in to the field.

One month later the mean and standard deviation for the number of cutlery sets sold by the 50 new sales people was obtained – 43 and 7. 2, respectively. Questions: 1. What kind(s) of analysis can be run to determine if the new sales training program was effective? 2. What is the null hypothesis to be tested? 3. Using the appropriate statistical test for the 0. 05 level of significance, calculate the appropriate test statistic. 4. Is the null hypothesis accepted or rejected? Why? 5. Specifically, what does this indicate to the sales manager? 6. How confident can the sales manager be in his statement of findings? 12] COMPENSATION FOR FACULTY MEMBERS As part of a work-study project for the Office of Institutional research at your college you have been assigned the task of analyzing faculty compensation (salary plus fringe benefits) during the 1980-1981 academic year. In particular your task is to compare colleges in two states that include a large variety of institutions of higher education – California and Massachusetts. Table 1 summarizes data that pertain to the average annual compensation in the 1980-1981 academic year for full professors employed at colleges and universities offering baccalaureate degrees.

Table 2 presents a cross classification of compensation level (categorized into above and below $40, 000) for the two states. The colleges have been divided into three categories. * Category I include institutions that offer the doctorate degree. Category IIA includes institutions offering degrees above the bachelor’s degree that have not been included in category I. Category IIB includes those institutions offering only the baccalaureate or equivalent degree. TABLE - 1

Summary statistics for compensation (in $000) of full professors in 1980-1981 in California and Massachusetts according to institution category (I, IIA, IIB) California Massachusetts I IIA IIB I IIA IIB n 14 50 10 9 24 13 X 44. 657 36. 324 31. 600 42. 311 31. 275 31. 546 S2 49. 718 46. 227 46. 329 34. 934 25. 110 60. 608 S 7. 051 6. 779 6. 807 5. 910 5. 011 7. 785 Source: Data extracted from " Economic Status of the Profession," Academe (Bulletin of the AAUP), Vol. 67, No. 4, August 1981. TABLE - 2 Cross classification of compensation level and state of institution State Compensation California Massachusetts Totals Below $40, 000 39 38 77 40, 000 and above 35 8 43 Total 74 46 120 Source: Data extracted from " Economic Status of the Profession," Academe (Bulletin of the AAUP), Vol. 67, No. 4, August 1981. * Theological seminaries have been excluded from consideration, as have colleges reporting only combined average salary for clerical and lay faculty. [13] Within each category you are to evaluate the differences in compensation paid by colleges in the two states. In addition, you are to determine whether there is a difference between the two states in the proportion of colleges that have an average compensation of $40, 000 or above for full professors.

This data set constitutes a random sample of 1, 600 adult passengers who flew with us on mainland routes over the 2-week period ending last Friday. It is imperative that we continue to monitor the airline services we provide through these quarterly surveys. By keeping tabs on our customer sand taking the market pulse, we can continue to make those improvements that will guarantee that our passengers remain loyal to Peller and, if they are satisfied, they will encourage their friends and families to fly with us. " Thank

you Mike," interrupted Lorena Martinez who recently took over as CEO of Peller Airlines, " will you kindly remind us of the central theme in this particular quarterly survey and give us your time table for presentation and discussion. " " Certainly, Ms. Martinez. The theme, ma'am, for this survey deals with passenger satisfaction and its potential relationships with reasons for travel and disposition of luggage. Gender differences will also be explored. As for a timetable, Dr. Tom Foley, the Director of Central Processing, assures me that the initial printouts will be ready by noon today.

Since it takes two working days for data cleansing and preliminary analyses, I will be ready to make our presentations at next week's board meeting. I'll need 15 minutes for the presentation and I request an additional 15 minutes for question, answers, and board discussion. " " Very good, Mike, it sounds like your Marketing and Promotion Department has got a handle on this one. On behalf of the board, I would like to grant your requests and state that we look forward to your presentation next week. Please keep me informed if you need anything to expedite the analysis.