Short Case Studies

ST4.1 Jim Norton, an engineering junior, was mailed two guaranteed line-of-credit applications from two different banks. Each bank offered a different annual fee and finance charge.

Jim expects his average monthly balance after payment to the bank to be $300 and plans to keep the credit card he chooses for only 24 months. (After graduation, he will apply for a new card.) Jim's interest rate on his savings account is 6% compounded daily. Table ST4.1 lists the terms of each bank:

(a) Compute the effective annual interest rate for each card.

(b) Which bank's credit card should Jim choose?

(c) Suppose Jim decided to go with Bank B and used the card for one year. The balance after one year is $1,500. If he makes just a minimum payment each month (say, 5% of the unpaid balance), how long will it take to pay off the card debt? Assume that he will not make any new purchases on the card until he pays off the debt.

TABLE ST4.1

Terms	Bank A	Bank B
Annual fee	$20	$30
Finance charge	1.55% Monthly interest rate	16.5% Annual percentage rate

ST4.2 The following is an actual promotional pamphlet prepared by Trust Company Bank in Atlanta, Georgia:

> "Lower your monthly car payments as much as 48%." Now you can buy the car you want and keep the monthly payments as much as 48% lower than they would be if you financed with a conventional auto loan. Trust Company's *Alternative Auto Loan* (AAL)^{SM} makes the difference. It combines the lower monthly payment advantages of leasing with tax and ownership of a conventional loan. And if you have your monthly payment deducted automatically from your Trust Company checking account, you will save $\frac{1}{2}$% on your loan interest rate. Your monthly payments can be spread over 24, 36, or 48 months.
>
> The amount of the final payment will be based on the residual value of the car at the end of the loan. Your monthly payments are kept low because you make principal payments on only a portion of the loan and not on the residual value of the car. Interest is computed on the full amount of the loan. At the end of the loan period you may choose from these options.
>
> 1. Make the final payment and keep the car.
> 2. Sell the car yourself, repay the note (remaining balance), and keep any profit you make.
> 3. Refinance the car.
> 4. Return the car to Trust Company in good working condition and pay only a return fee.
>
> So, if you've been wanting a special car, but not the high monthly payments that could go with it, consider the *Alternative Auto Loan*. For details, ask at any Trust Company branch.
>
> **Note 1:** The chart on the next page is based on the following assumptions. Conventional auto loan 13.4% annual percentage rate. *Alternative Auto Loan* 13.4% annual percentage rate.
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> **Note 2:** The residual value is assumed to be 50% of sticker price for 24 months and 45% for 36 months. The amount financed is 80% of sticker price.
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> **Note 3:** Monthly payments are based on principal payments equal to the depreciation amount on the car and interest in the amount of the loan.

TABLE ST4.2

Amount Financed	Financing Period (months)	Monthly Payment: Alternative Auto Loan	Monthly Payment: Conventional Auto Loan
$10,000	24	$249	$477
	36	211	339
	48	191	270
$20,000	24	498	955
	36	422	678
	48	382	541

Note 4: The residual value of the automobile is determined by a published residual value guide in effect at the time your Trust Company Banks *Alternative Auto Loan* is originated.

Note 5: The minimum loan amount is $10,000 (Trust Company will lend up to 80% of the sticker price). Annual household income requirement is $50,000.

Note 6: Trust Company reserves the right of final approval based on customer's credit history. Offer may vary at other Trust Company Banks in Georgia.

(a) Show how the monthly payments were computed for the *Alternative Auto Loan* by the bank.

(b) Suppose that you have decided to finance a new car for 36 months from Trust Company Bank. Suppose also that you are interested in owning the car (not leasing it). If you decided to go with the *Alternative Auto Loan*, you would make the final payment and keep the car at the end of 36 months. Assume that your opportunity cost rate (personal interest rate) is an interest rate of 8% compounded monthly. (You may view this opportunity cost rate as an interest rate at which you can invest your money in some financial instrument, such as a savings account.) Compare Trust Company Bank's alternative option with the conventional option and make a choice between them.

ST4.3 In 1988, the Michigan legislature enacted the nation's first state-run program, the *Pay-Now, Learn-Later Plan*, to guarantee college tuition for students whose families invested in a special tax-free trust fund. The minimum deposit now is $1,689 for each year of tuition that sponsors of a newborn want to prepay. The yearly amount to buy into the plan increases with the age of the child: Parents of infants pay the least, and parents of high school seniors pay the most—$8,800 this year. This is because high school seniors will go to college sooner. Michigan State Treasurer Robert A. Bowman contends that the educational trust is a better deal than putting money into a certificate of deposit (CD) or a tuition prepayment plan at a bank, because the state promises to stand behind the investment. "Regardless of how high tuition goes, you know it's paid for," he said. "The disadvantage of a CD or a savings account is you have to hope and cross your fingers that tuition won't outpace the amount you save." At the newborns' rate, $6,756 will prepay four years of college, which is 25% less than the statewide average public-college cost of $9,000 for four years in 1988. In 2006, when a child born in 1988 will be old enough for college, four years of college could cost $94,360 at a private institution and $36,560 at a state school if costs continue to rise the expected average of at least 7% a year. The Internal Revenue Service issued its opinion, ruling that the person who sets aside the money would not be taxed on the amount paid into the fund. The agency said that the student would be subject to federal tax on the difference between the amount paid

in and the amount paid out. Assuming that you are interested in the program for a newborn, would you join it?

ST4.4 Consider the following advertisement seeking to sell a beachfront condominium at SunDestin, Florida.

> 95% Financing $8\frac{1}{8}$% interest!!
>
> 5% Down Payment. Own a Gulf-Front Condominium for only $100,000 with a 30-year variable-rate mortgage. We're providing incredible terms: $95,000 mortgage (30 years), year 1 at 8.125%, year 2 at 10.125%, year 3 at 12.125%, and years 4 through 30 at 13.125%.

(a) Compute the monthly payments for each year.
(b) Calculate the total interest paid over the life of the loan.
(c) Determine the equivalent single-effective annual interest rate for the loan.

ST4.5 Are you shopping for a mortgage to finance a home that you expect to own for no more than a few years? If so, you should know about a hybrid mortgage. Hybrid loans give prospective home buyers the ability to buy a lot more home than they can afford—thanks to the initially lower interest rate. But with such flexibility comes greater risk. Since lenders are free to design loans to fit borrowers' needs, the terms and fees vary widely and homeowners can get burned if rates climb higher.

Hybrid mortgages allow homeowners to benefit from the best aspects of both fixed-rate and adjustable-rate mortgages (ARMs). With hybrids, borrowers choose to accept a fixed interest rate over a number of years—usually, 3, 5, 7, or 10 years—and afterward the loan converts to an ARM. But therein lies the danger: While you're getting an extraordinarily low rate up front for a few years, when the fixed-rate period expires you could very well end up paying more than double your current rate of interest.

At a rate of 6.16% for a 30-year mortgage, for example, a person borrowing $200,000 would pay $1,220 a month. With a seven-year hybrid, more commonly called a 7/1 loan, at the going rate of 5.61%, that monthly payment drops to $1,150. By the end of the seventh year, the homeowner would save about $7,700 in interest charges by going with a seven-year hybrid. To say that there are drawbacks is an understatement. Despite the surge in popularity, a hybrid loan can be a ticking time bomb for borrowers who plan on holding the loan for the long term. Discuss the potential drawbacks associated with the hybrid ARMs by giving a specific loan and interest rate scenario.