CHAPTER 2: Smart Saving

Did You Know?

Over the past nearly 50 years, the personal savings rate in the U.S. has dropped from 12.9% in 1970 to only 2.4% in 2017.[4]

In the previous chapter, you learned the importance of budgeting, including setting aside money, or **saving** for larger expenses. The goal of saving is to provide funds for emergencies and short-term goals. In this chapter, you'll learn why and how a bank savings account can help you save.

Savings accounts offer several benefits:

1. *Your money is secure*. Money tucked away at home could be stolen, lost, or destroyed in a house fire. Most savings accounts are insured by a government agency, called the Federal Deposit Insurance Corporation (FDIC), that pays you back if something happens to your bank.
2. *You are less likely to spend your money on impulse.* Some savings accounts limit the number of withdrawals you can make. Some require you to keep a minimum balance.
3. *Your savings grow faster*. Money deposited in a savings account earns **compound interest**.

Picture this: You would like to go on a vacation, which costs $1,000. So you begin stashing $50 per week in a drawer. The money you put into the drawer is called a **deposit**. If you continue to deposit $50 a week into your drawer, it will take you 20 weeks to save up enough to go on the trip.

Now, let's say that instead of putting the money into a drawer, you open a savings account at a bank. When you deposit money into a savings account, the bank can use your money to invest or make loans, which in turn helps the bank make more money. It pays you for this opportunity with something called interest. With **interest**, your savings actually grow.

Compound Interest

The amount of interest you earn, called the **interest rate**, is calculated as a percentage of your **account balance**. Very simply: If you have an account balance of $1,000 and an interest rate of 3%, you can expect to earn $30 in interest.

The equation would look like this:

Starting Account Balance x Interest Rate = Interest Earned

$1,000 x 0.03 = $30

Account Balance + Interest Earned = Ending Account Balance

$1,000 + $30 = $1,030

In reality, it's a little more complicated than that: Interest is paid periodically, instead of in one lump sum, and it builds on itself — or compounds — over time.

For example, let's say that the 3% interest rate quoted above is an annual percentage, meaning that your account earns 3% interest per year. And let's say that the payments are made monthly.

- The bank divides 3% by 12 months, to get 0.25%.
- Each month, your account earns 0.25% interest.
- As your account balance gradually increases each month, your ending balance grows along with the interest payment.

Future Value, Present Value, and Discount Factor

In order to set and reach savings goals based on compound interest, you need to be able to compare the value of your money now, when you're putting it into the bank, to its value in the future, when you will take it out and use it.

It comes down to three fundamental concepts:

- **Future value** is the amount of money you expect to have in the future, *after* a period of saving. It includes your initial deposit plus all of the interest you will earn. So, if you have $1,000 today and earn 0.25% interest per month over the next 12 months, the one-year future value of that $1,000 investment is $1,030.42. The two-year future value is $1,061.76, because that is how much your $1,000 will have grown into.

[4] https://www.statista.com/statistics/246234/personal-savings-rate-in-the-united-states/

- **Present value** is the amount your money is worth now, or the amount you need to put away today in order to reach a certain value in the future. So, if your goal is to have $1,030.42 in a year, and you will earn 0.25% interest per month, then you need to put $1,000 into the account today.
- **Discount factor** is a little trickier. It is calculated by dividing the present value by the future value.
  - In our example, $1,000 ÷ $1,030.42 = .9705. Rounding off, the discount factor at 1 year is 97%. You could say that your money today is worth 97% of what it will be worth in the future.
  - But at 5 years, when the future value is $1,161.62, the discount factor is .8609. In other words, the present value is only 86% of the future value at 5 years.
  - The key point to remember is that the lower the discount factor, the more your money has grown, and vice versa. This provides you with a tool to compare the growth of two accounts or to check incremental progress over time.
  - The discount factor is important because future value is impacted by more than just one factor — the interest rate, how often it is compounded, and the amount of time your money is in the account.

The Rule of 72

The goal of saving money is to increase the worth of that savings. The **Rule of 72** helps you make quick, general decisions about the most effective way to save your money. You simply divide 72 by the annual interest rate to determine the total number of years it will take to double your money.

Let's go back to our original savings account of $1,000. We saved this money at an annual rate of 3% interest. Using the Rule of 72, if you do the math, at a 3% annual interest rate it takes 24 years to double the initial $1,000 savings.

There are a couple of caveats when using the Rule of 72.

- First, remember that it is an estimate, not an exact calculation. For example, if you are earning 8% interest on your money, the Rule of 72 indicates that it will take 9 years to double your money. When you calculate the exact amount of time it would take, the figure is actually 9.01 years — quite close to the estimated amount of time, but not exact.
- Next, note that the Rule of 72 works best when estimating for interest compounded annually at rates below 20%. For interest rates higher than 20%, its accuracy diminishes.

When you open a savings account at your bank, you may notice multiple options such as basic savings, CDs, and money market accounts. Each of these offers unique benefits for specific goals and savings terms.

THE PROS AND CONS OF DIFFERENT SHORT-TERM SAVINGS OPTIONS

	PROS	CONS
SAVINGS ACCOUNT	• Unlimited withdrawals. • Low minimum balance requirements. • Low or no fees. • Access to ATMs. • Compatible with electronic transfers.	• Very low interest rates. • Limited number of withdrawals per month.
MONEY MARKET ACCOUNT	• Relatively high rates of interest compared to savings and checking accounts. • Ability to write checks, make ATM withdrawals, and perform electronic transfers.	• High minimum deposit required to avoid monthly fees. • Limited number of withdrawals per month.
CERTIFICATE OF DEPOSIT (CD)	• Higher interest rates than savings accounts. • The interest rate doesn't change during the term of the account. • No fees when you hold your account to maturity.	• Penalties for early **withdrawal** make your money less accessible. • No access to your deposit through checks, ATM transactions, or electronic transfers.

Final Note:

People save first, and when they have saved sufficiently, then they may choose to take some of their savings and begin **investing** it. Book 4 in the *Building Your Future* series, titled Accumulating Wealth, will cover common types of investments, strategies, and other information.

Activity 1

PART 1: COMPOUND INTEREST

Compound interest can make your savings grow. Take a look at this spreadsheet to see how. Then answer the questions to learn more about how compound interest can give a real boost to your savings.

Month	Interest Rate	Beginning Balance	Interest Payment	Ending Balance
1	0.25%	$1,000.00	$2.50	$1,002.50
2	0.25%	$1,002.50	$2.51	$1,005.01
3	0.25%	$1,005.01	$2.51	$1,007.52
4	0.25%	$1,007.52	$2.52	$1,010.04
5	0.25%	$1,010.04	$2.53	$1,012.57
6	0.25%	$1,012.56	$2.53	$1,015.10
7	0.25%	$1,015.09	$2.54	$1,017.64
8	0.25%	$1,017.63	$2.54	$1,020.18
9	0.25%	$1,020.18	$2.55	$1,022.73
10	0.25%	$1,022.73	$2.56	$1,025.29
11	0.25%	$1,025.28	$2.56	$1,027.85
12	**0.25%**	**$1,027.85**	**$2.57**	**$1,030.42**
13	0.25%	$1,030.42	$2.58	$1,033.00
14	0.25%	$1,033.00	$2.58	$1,035.58
15	0.25%	$1,035.58	$2.59	$1,038.17
16	0.25%	$1,038.17	$2.60	$1,040.77
17	0.25%	$1,040.77	$2.60	$1,043.37
18	0.25%	$1,043.37	$2.61	$1,045.98
19	0.25%	$1,045.98	$2.61	$1,048.59
20	0.25%	$1,048.59	$2.62	$1,051.21
21	0.25%	$1,051.22	$2.63	$1,053.84
22	0.25%	$1,053.85	$2.63	$1,056.47
23	0.25%	$1,056.48	$2.64	$1,059.11
24	**0.25%**	**$1,059.12**	**$2.65**	**$1,061.76**
25	0.25%	$1,061.77	$2.65	$1,064.41
26	0.25%	$1,064.42	$2.66	$1,067.07
27	0.25%	$1,067.08	$2.67	$1,069.74
28	0.25%	$1,069.75	$2.67	$1,072.41
29	0.25%	$1,072.42	$2.68	$1,075.09
30	0.25%	$1,075.10	$2.69	$1,077.78
31	0.25%	$1,077.79	$2.69	$1,080.47
32	0.25%	$1,080.48	$2.70	$1,083.17
33	0.25%	$1,083.18	$2.71	$1,085.88
34	0.25%	$1,085.89	$2.71	$1,088.59
35	0.25%	$1,088.60	$2.72	$1,091.31
36	**0.25%**	**$1,091.32**	**$2.73**	**$1,094.04**

1. The spreadsheet is based on the following formulas. Fill in the blanks:
   - Interest Payment = ____________ x Beginning Balance
   - ____________ = Beginning Balance + Interest Payment
   - How would you express each of the statements above as a numerical formula for month 1 of the spreadsheet?

   ____

   ____

2. Write a mathematical formula to show why the monthly interest rate is 0.25% if the annual percentage is 3%.

   ____

3. How did the beginning balance grow over the course of the first year? If 3% of $1,000 is $30, where did the extra 42 cents come from?

   ____

4. Compare the monthly interest payments at 12 months, 24 months, and 36 months. Why do the monthly interest payments increase over time?

   ____

5. How do these amounts illustrate the concept of compound interest?

   ____

6. Why would a bank choose to pay small payments over time in an amount that totals more than the 3% annual interest rate?

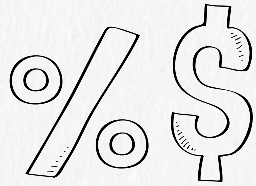
   ____

7. What would happen if the 3% annual percentage rate was compounded daily instead of monthly? What would the ending balance be after 1 year?

   ____

Activity 1

PART 2: THE RULE OF 72



Use the Rule of 72 to practice estimating how long it will take to double your $1,000 savings using various interest rates. If the account paid each annual interest rate listed below, how long would it take to double your savings?

- 5% ____________________ years
- 8% ____________________ years
- 12% ____________________ years
- What conclusions can you draw about how interest rates affect the value of money over time?

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Activity 2

REAL WORLD PRACTICE

Up to this point, we've worked with an example that shows that you've made only one deposit and no withdrawals from your savings account. While savings accounts are designed to be a place to put money for a fairly long period of time before it is withdrawn, these types of accounts typically have some deposits and withdrawals over the course of a year. It is important to know that many banks limit the number of withdrawals that can be made from a savings account without incurring bank charges.

Let's use a spreadsheet to create a more realistic example of savings account activity and find out how that changes the end result. You can make your own spreadsheet based on the model below, or download a spreadsheet at ymiclassroom.com/byf/byf_book1_savings_spreadsheet.xlsx.

A	B	C	D	E	F	G
Month	Interest Rate	Withdrawals	Beginning Balance	Interest Payment	Deposits	Ending Balance
1	0.25%	$0.00	$1,000	$2.50	$0.00	$1,002.50

To calculate everything correctly, you will need these formulas:

- Interest Payment = Interest Rate x Beginning Balance
- Ending Balance = Beginning Balance + Interest Payment + Deposits
- Beginning Balance = Ending Balance from the previous month – Withdrawals from the current month

Use your spreadsheet to calculate the following scenario:

- You start your account with a beginning balance of $1,000.
- You deposit $320 monthly (half of the money you earn from your part-time job).
- In month 4 you withdraw $45 to purchase a video game.
- In month 7 you deposit $50 you received for your birthday.
- In month 10 you withdraw $200 to pay a registration fee for an upcoming activity.

Now, answer each question below.

- How much is in your savings account at the end of 12 months?
  $______________________________
- How much interest did you earn over the course of the year?
  $______________________________
- Why is using a savings account better than using your dresser drawer for saving money?
  ____

Independent Practice

Try this scenario on your own. You would like to purchase a reliable used car. You've done some research and learned that it will cost you approximately $5,000 to buy the car. You earn $688 a month from your part-time job. You've already managed to save $250 at home, but you've been tempted to spend it. You've found a bank that will pay you 3.24% interest annually on a savings account, with interest payments made monthly. How long will it take you to save up for the car if you put half of your earnings into the savings account each month? Using what you have learned about savings accounts, create a spreadsheet that will show how you found your answer.