

Business Math: A Step-by-Step Handbook Abridged Instructor Resources

BUSINESS MATH: A STEP-BY-STEP HANDBOOK ABRIDGED INSTRUCTOR RESOURCES

Instructor Resources

JELENA LONCAR-VINES

Conestoga College
Kitchener, Ontario, Canada



Business Math: A Step-by-Step Handbook Abridged Instructor Resources by Jelena Loncar-Vines is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License, except where otherwise noted.

CONTENTS

Welcome to Business Mathematics	vii
Welcome to this Instructor Resource	x
Funding Acknowledgements	xi

Part I. Instructor Resources

1. Introduction to Storyline	1
2. Story Guidelines	2
3. Story Introduction to Lightning Wholesale	5
4. Chapter 8 Case Study	7
5. Chapter 9 Case Study	11
6. Chapter 10 Case Study	14
7. Chapter 11 Case Study	17
8. Chapter 12 Case Study	19
9. Chapter 13 Case Study	21
10. Case Study Solutions	23

WELCOME TO BUSINESS MATHEMATICS

What Is Business Math?

Business math is the study of mathematics required by the field of business. By the fact that you are reading this textbook, you must be interested in a business field such as accounting, marketing, human resources, or economics.

Regardless of your path, you cannot avoid dealing with money and numbers. Both personally and in your career you certainly use elementary arithmetic such as addition, subtraction, multiplication, and division. However, there is a whole field of mathematics that deals specifically with money. You will work with taxes, gross earnings, product prices, and currency exchange; you will be offered loans, lines of credit, mortgages, leases, savings bonds, and other financial tools. Do you know what these are and how these financial tools can maximize your earnings and minimize your costs? Do you have what it takes to execute smart monetary decisions both personally and for your business? Do you know how interest works and how it gets calculated? If you can answer “yes” to these questions, then you are already off to a great start. If not, by the end of this textbook you will have a better understanding of all of these topics and more.

How Do I Learn about Business Math?

Let’s be realistic. In some areas of life and business, you can achieve a reasonable degree of understanding just by reading. However, reading about business mathematics without doing it would be disastrous. To succeed, you must follow a structured approach:

1. Always read the content prior to your professor covering the topic in class.
2. Attend class, ask questions, and explore the topic to advance your understanding.
3. Do the homework and assignments—you absolutely must practice, practice, and practice!
4. Seek help immediately when you need it. Learning mathematics is like constructing a building. Each floor of the building requires the floor below it to be completed first. In mathematics, each section of a textbook requires the concepts and techniques from the sections that preceded it. If you have trouble with a concept, you must fix it NOW before it causes a large ripple effect on your ability to succeed in subsequent topics. So the bottom line is that you absolutely cannot replace this approach—you must follow it.

About this Textbook

This textbook covers topics from Chapters 8 to 13 inclusive adapted from the original *Business Math: A Step-by-Step Handbook* by J. Olivier and Lyryx Learning Inc. View the original text for free at *Business Math: A Step-by-Step Handbook*. Reused under a CC BY-NC-SA license.

Accessibility Statement

Please review *Conestoga College's Accessibility Statement for OER Projects*.

Original Book Citation

Author: J. Olivier

Publisher: Lyryx Learning Inc.

Book title: Business Math: A Step-by-Step Handbook

Book version: 2021B

Publication date: July 19, 2021

Location: Calgary, Alberta, Canada

Book URL: <https://lyryx.com/subjects/business/business-mathematics/>

About the Authors

Sanja Kraishnik, BA, BEd, MMath

Sanja, the lead on this OER project, has taught math in the Business School at Conestoga College ITAL, in Kitchener, Ontario, for ten years. Sanja's dedication to ensuring that math is accessible to all students is demonstrated by using LaTeX and the MathJax plug-in for Pressbooks to render math formulas and her dedication to ensuring this OER met accessibility requirements. To learn more about using LaTeX and Pressbooks, review *Using LaTeX in Pressbooks* by Sanja Krajisnik and Jelena Loncar.

Jelena Loncar-Vines, OCT, MSc, BEd

Jelena is a faculty member in the School of Business at Conestoga College ITAL and can be reached at jloncarvines@conestogac.on.ca. Jelena has been a mathematics educator for 14 years, 11 of which have been at the post-secondary level. Jelena's career focus is to help make mathematics relatable and accessible to students. In addition to teaching, Jelena has volunteered on mathematics education-focused organizations, both provincial and local. Jelena is a life-long learner and enjoys active participation in professional development opportunities geared toward mathematics, post-secondary education, and effective use of

technology in the classroom. The development of this OER, and the opportunity for close collaborations with colleagues, has been a very rewarding experience.

Carol Leppinen, Honours BMath, BEd, Honours Specialist Mathematics

Carol is a faculty member in the Business School at Conestoga College ITAL, in Kitchener Ontario and can be reached at cleppinen@conestogac.on.ca. Carol has been a full-time professor at Conestoga College ITAL since 1998 where she has taught Business Mathematics, Statistics, and Quantitative Methods. Prior to that, Carol taught Mathematics and Computer Science at the secondary school level for 5 years. Carol has been a career teacher and is passionate about her students. Carol is grateful for all that her students have taught her over the years.

Book Cover Attribution

Cover image created with Canva. Photos reused under the Canva Free Media License Agreement.

WELCOME TO THIS INSTRUCTOR RESOURCE

This Instructor Resources book was created to accompany *Business Math: A Step-By-Step Approach* Abridged by Krajisnik et al., which focuses on Chapters 8 through 13, inclusive. The content in this resource can be used with original *Business Math: A Step-by-Step Handbook* by J. Olivier as well for the relevant chapters.

This resource introduces the concept of using a story for your Business Math class, guidelines to get you started, as well as the case studies themselves. The solutions to the case studies contained herein can be accessed by emailing [ecampusontario](mailto:ecampusontario@utoronto.ca).

Best wishes to you as you endeavour in an alternative approach to teaching and learning Business Math!

FUNDING ACKNOWLEDGEMENTS

This project is made possible with funding by the Government of Ontario and through eCampusOntario's support of the Virtual Learning Strategy. To learn more about the Virtual Learning Strategy visit: <https://vls.ecampusontario.ca>.

ecampus
Ontario

Ontario 

1.

INTRODUCTION TO STORYLINE

Humans have a natural disposition for interpreting our experiences as stories. Using a “story” to deliver course content has been used in K-12 classrooms, as well as in the form of case studies in professional programs such as law (McNett, 2016).

With a Case Study approach in mind, this Instructor Resource to Business Math: A Step-by-Step Approach Abridged was created to facilitate the use of story in teaching Business Math concepts. The original *Business Math: A Step-by-Step Handbook* was designed with a Case Study for each chapter. To build the storyline concept for the text, the following contributions were made:

- An Introduction to Lightning Warehouse story was created,
- All content and solutions were made accessible, and
- Story Guidelines section created.

Using a story in your class can be a fun way to engage your students, create connections between concepts that can otherwise seem disjointed, and incorporate industry-based examples.

The idea of using a story to deliver your math content may be new to you. The How To, Tips, and Goals section provides a starting point. Please incorporate your own ideas and tweak as needed for your students. We hope that you enjoy exploring new avenues of teaching your students Business Mathematics!

References

McNett, G. (2016). Using Stories to Facilitate Learning. *College Teaching*, 64(4), 184–193. <https://doi.org/10.1080/87567555.2016.1189389>

2.

STORY GUIDELINES

This section discusses some guidelines to consider if you are adopting a storytelling approach to your Business Math class. Please note that the terms “story”, “storyline”, and “case study” are used synonymously.

Before You Start

Step 1

Before using a story with your class, it is important that:

1. The instructor has clear objectives for using the story, and
2. The students understand why a story is being used in the course and how it can be useful to their learning.

It is recommended that the objectives and reasoning is shared with students. This can help with student buy-in and engagement as a story approach may be new way of learning math for students.

Step 2

Once you have decided on your objectives, the next step is to decide how you will incorporate the story in your class. Some options to consider:

- Case study day at end of each chapter
- Case study as review for mid-term or end-of-term
- Case study as formative assessment

Setting the Stage

The “Introduction to Lightning Wholesale” introduces the premise of the story. This section introduces the company, its functions, its characters, and summarizes its challenges. Remember to include only the

information from the Introduction that is relevant to your course. Add in any extra anecdotes to make it more interesting and fun. It is important for students to have a proper introduction to the story so that they have an idea of the main elements.

Structure of Chapter Case Studies

Each chapter's case study can be found in this resource. The structure of each case study is as follows:

- **The Situation:** A description of Lightning Warehouse's scenario as relevant to the chapter's content.
- **Important Information:** Any assumptions or other caveats are described in this section.
- **The Data:** Additional data is provided to solve the problem.
- **Your Tasks:** Specific questions that need to be solved.

Remember to edit or remove any information that is not relevant to your specific course.

BOPPPS

When considering how and where within a lesson plan the Lightning Warehouse story can be incorporated, you may consider the "BOPPPS" Lesson Plan framework (Brillinger, 2022):

- **B** – Bridge-In
- **O** – Outcomes
- **P** – Pre-Assessment
- **P** – Participatory Learning
- **P** – Post-Assessment
- **S** – Summary

For full details on each, visit Conestoga College's Creating a BOPPPPS Lesson Plan.

Tips from the Author

- Share the Introduction To Lightning Wholesale
- Introduce each chapter's full case study, including the Your Tasks section, at the beginning of each chapter. This is helpful to introduce new keywords and/or concepts that will be discussed in the chapter. In addition, some chapters will have an Important Information section. You can review this with students as it is often a nice way of introducing some caveats or assumptions that students need to

keep in mind as they move through the content.

- If the case study is revisited as Bridge-In for each new lesson, students will have the story fresh in mind. Some students may be thinking about the problem as new material is introduced. By the time the end of chapter is reached, some students will be able to solve The Tasks independently.
- The Post-Assessment stage is a great time to connect concepts to each other.

Tips from McNett (2016)

- Focus on one or a few key characters, highlight their personal qualities and quirks.
- Incorporate and mystery or suspense.
- Make sure that you, as the instructor, have clear goals in using the Case Study.
- Allow for adequate time for student discussion.
- Provide students opportunity to fill-in the gaps .

References

- Brillinger, K. (2022, January 27). Creating a BOPPPPS lesson plan. *Faculty Learning Hub, Conestoga College Teaching and Learning*. <https://tlconestoga.ca/creating-a-bopppps-lesson-plan/>
- McNett, G. (2016). Using Stories to Facilitate Learning. *College Teaching*, 64(4), 184–193. <https://doi.org/10.1080/87567555.2016.1189389>

3.

STORY INTRODUCTION TO LIGHTNING WHOLESALERS

Note: If there is any content that does not apply to your course, please make sure to edit the “Introduction to Lightning Wholesalers” to only include the relevant information.

Introduction To Lightning Wholesalers

Lightning Wholesalers is a mid- to large-size company that specializes in working directly with manufacturers to bring sporting goods and equipment to mid- to small-sized retailers. The company is located in Southern Ontario, Canada. Lightning Wholesalers acquires the goods, stores them in their warehouses, and distributes to retailers, who then sell to sporting enthusiasts across the province. Suppliers are global, including from the United States.

There are a few main concerns for Lightning Wholesalers management at the moment: payroll needs review, revenues, costs and expenses need forecasting for the next fiscal year, the ski product line is considering reducing their line, cash flow and investment management, and it is time to negotiate a new contract with some unionized employees that is not going well, which could result in a three-month strike.

On their payroll, Lightning Wholesalers has employees that are paid on a salary, hourly, commission, and overtime basis.

Lightning Wholesalers cares about its employees and retailers. Where managers can assist their employees, they try to. Where retailers need guidance, Lightning Wholesalers tries to fill this gap as best they can.

More recently, Quentin, Manager of Human Resources, was approached by an employee, Katherine. Katherine needed some extra cash and asked for advanced pay. Although against company policy to provide an advance on pay, Quentin was able to have a chat with Katherine on other options to her current plan of working with a PayDay Loan company.

In working with its small retailers, many of which are owned and operated by sole proprietors, Lightning Wholesalers assists the owners with their pricing to help develop promotional pricing plans and the amounts of the payments that can be advertised. Lightning Wholesalers freely offers the help, since it means more sales and increased profits for the company. Typically, retailers will sell the skis at their list price.

Lightning Wholesalers has a strong Registered Retirement Savings Plan (RRSP) program, with dollar-to-dollar matching, which they encourage their employees to take advantage of. Where they can, they try to

educate their employees on the ins-and-outs of RRSPs so that their employees have awareness and can manage their RRSPs appropriately.

The Finance Department is responsible to effectively manage the company's money. Due to its size, Lightning Wholesale, has a separate bank account for each of its departments from which all expenses, purchases, and charges are deducted. This account has all revenues and interest deposited into it. Currently, the manager of the sporting good department wants a summary of all interest amounts earned or charged to her department for current fiscal year. This allows her to better understand and assess the financial policies of the company and make any necessary change for the next fiscal year. Lightning Wholesale invests in Treasury Bills (T-Bills) as part of their financial strategy.

In the warehouse, the forklifts need replacing. The Purchasing Manager is working with Combilift to develop a payment structure. Although Lightning Wholesale has the cash on hand, it is trying to figure out if it is in their best interest to take out a loan instead.

With year-end approaching, Lightning Wholesale has many processes that they are wrapping up. It is important that all departments are executing their responsibilities as accurately and seamlessly as possible.

4.

CHAPTER 8 CASE STUDY

Managing A Company's Investments

The Situation

As with most mid-size to large companies, Lightning Wholesale has a finance department to manage its money. The structure of Lightning Wholesale's financial plan allows each department to have its own bank account from which all expenses, purchases, and charges are deducted. This same account has all revenues and interest deposited into it.

The manager of the sporting goods department wants a summary of all interest amounts earned or charged to her department for the year 2013. This will allow her to better understand and assess the financial policies of the company and make any necessary changes for 2014.

The Data

Sales Data 2013 Sporting Goods Department

Month (Year 2013)	Total Sales Revenue ('000s)	Cost of Goods Sold ('000s)	Operating Expenses ('000s)
January	\$1,798	\$2,102	\$156
February	\$2,407	\$2,242	\$100
March	\$2,568	\$2,606	\$222
April	\$2,985	\$2,719	\$258
May	\$3,114	\$2,831	\$269
June	\$3,242	\$2,887	\$280
July	\$3,306	\$3,363	\$286
August	\$3,852	\$4,203	\$333
September	\$4,815	\$6,306	\$525
October	\$7,222	\$11,210	\$625
November	\$12,839	\$8,408	\$1,111
December	\$9,630	\$1,569	\$833

Monthly T-Bill Yields and Prime Rate

Select Dates	T-bill Yields	Prime Rate
December 31, 2012	2.85%	4.25%
January 31, 2013	2.90%	4.25%
February 28, 2013	2.87%	4.25%
March 31, 2013	3.04%	4.75%
April 30, 2013	3.09%	4.75%
May 31, 2013	3.11%	4.75%
June 20, 2013	3.07%	4.75%
July 31, 2013	2.95%	4.50%
August 31, 2013	2.92%	4.50%
September 30, 2013	3.40%	5.00%
October 31, 2013	3.45%	5.00%
November 30, 2013	3.47%	5.00%

Important Information

- The balance in the sporting goods bank account on December 31, 2012, was \$2,245,636.45.
- The bank account permits a negative balance, which the bank treats as an operating loan. The interest rate on any operating loan is prime + 0.5%. Accrued interest is placed into the account on the last day of each month.
- When a positive balance exists, the bank pays interest at 0.85% on the first \$50,000 in the account and 1.2% only on the portion above \$50,000. Interest is deposited on the last day of each month.
- On the last day of each month, the finance department purchases T-bills in the market that will mature by the last day of the next month. The face value of T-bills are bought in denominations of exactly \$100,000 in a quantity as permitted by the current balance in the bank account. If the bank account has a negative balance (i.e., it is using its operating loan), no T-bills are purchased that month. For example, if the bank account has a balance of \$350,000 on March 31, three \$100,000 T-bills will be purchased with 30 days left to maturity.
- Assume all revenues are deposited to the account at the end of the corresponding month.
- Assume all cost of goods sold and operating expenses are deducted at the end of the corresponding month.
- For simplicity, assume the balance in the bank account remains unchanged throughout each month.

Your Tasks

The manager wants a report that summarizes the following information from December 31, 2012, to December 31, 2013:

1. The total interest earned through T-bill investments.
2. The total interest earned from the bank account.
3. The total interest charged by any operating loans.
4. The final balance in the bank account as of December 31, 2013, when no purchases of T-bills for January 2014 have been made.

In order to meet the manager's requirements, work through 2013 month by month starting from December 31, 2012, by following the steps below. Once arriving at December 31, 2013, use the answers to provide the four pieces of information requested by the manager.

Using the opening balance, determine the face value of T-bills that can be purchased. If the balance is negative, no T-bills are purchased, so skip to step 4.

1. Calculate the purchase price of the T-bills using the current market yield and the number of days until the end of the next month. The difference between the purchase price and the face value is the total interest earned for the month by T-bills.
2. Deduct the purchase price of the T-bills from the balance in the account.
3. Examine the account balance.
4. If the balance is positive, calculate the interest earned for the month based on the tiered interest rate structure. This is the total interest earned by the investment for the month.
5. If the balance is negative, charge interest to the account for the month using the interest rate charged by the bank. This is the total interest charged by the operating loan for the month.
6. To figure out the balance at the end of the next month, take the balance from step 4, add the face value of the T-bills that are maturing at the end of the month, add any interest earned from the bank account (step 4a), deduct any interest charged on the operating loan (step 4b), add the revenues for the month, and deduct the expenses and cost of goods sold for the month.
7. Go back to step 1 and repeat for the next month.
8. When all months are complete, calculate the required totals and present the requested summary information to the manager.

CHAPTER 9 CASE STUDY

Case Study Exploring Different Sources of Compound Financing

The Situation

Quentin is the human resources manager for Lightning Wholesale. Recently, he was approached by Katherine, who is one of the employees in the sporting goods department. She enquired about the possibility of getting an advance on her next paycheque. Quentin informed her that Lightning Wholesale's payroll policy is not to provide advances on paycheques. Katherine indicated that she was having some financial problems, did not have a very good credit rating, and would be forced on her way home to stop in at a payday loan company to take out an advance.

Concerned for his employee, Quentin visited Katherine later in the day and sat down with her to show her the true costs of using a payday loan company. He also wanted to show her a better alternative to get some short-term financing.

The Data

Canadian payday loan companies generally operate under one of three structures:

1. **The Traditional Model.** These companies incur all operating costs, provide their own capital for any loan, and collect interest and charges or fees for their services. These companies assume all the risk.
2. **The Broker Model.** These companies incur all operating costs but do not provide the capital for the loan. A third-party partner provides the capital, and the payday loan company charges a brokerage fee for its services. The third-party partner collects all interest and assumes all risk.
3. **The Insurance Model.** These companies incur all operating costs and recover these costs through fees and insurance premiums on the loan. An insurance company (usually owned by the payday loan company) provides all capital and assumes all risk.

The table below summarizes a sample of charges that could be imposed under each model.

Sample of Charges under Traditional, Broker, and Insurance Models of Canadian Payday Loan Companies

Charges	Traditional Model	Broker Model	Insurance Model
Effective Rate of Interest	59%	21%	48%
Per Transaction Fee	\$9.99	\$10.00	N/A
Cheque Cashing Fee	7.99% of principal and interest combined	\$8.00	N/A
Insurance Fee	N/A	N/A	19% of principal and interest combined
Brokerage Fee	N/A	29.5% of principal and interest combined	N/A

Observe that under Section 347 of the Criminal Code, any charges related to the borrowing of money are considered interest. This includes any types of fees and charges, although in name they may not be called interest.

- As an alternative to using a payday loan company, Katherine could use a finance company that targets people with poor credit ratings or those in quick need of money. These companies typically charge 28% compounded monthly on loans.
- A second alternative is to take a cash advance on her credit card. Most credit card companies charge around 18% compounded daily.

Important Information

- Like most people who borrow money from payday loan companies, Katherine needs to borrow a small sum of money for a short period of time. Her requirements are to borrow \$300 for a period of seven days, or one week.
- Assume exactly 52 weeks in a year.

Your Tasks

1. Show Katherine the true effective rate of interest she is being charged if she borrows the money from any of these payday loan companies. For each model:
 1. Convert the effective rate into a nominal weekly compounded rate.
 2. Calculate the future value of the loan after one week using the weekly periodic rate.
 3. Calculate any cheque cashing, brokerage, or insurance fees on the future value.
 4. Take the interest on the loan and add all fees charged, including any flat fees. This is the total

- interest amount on the loan.
5. Convert the interest amount into a percentage of principal. This is the periodic interest rate per week.
 6. Take the periodic interest rate per week and convert it into a nominal weekly compounded rate.
 7. Convert the nominal weekly compounded rate into an effective rate.
2. Now make Katherine aware of what the alternative sources of financing will cost.
 1. Convert both the finance company's interest rate and the credit card's interest rate into effective rates and weekly compounded nominal rates.
 2. For each option, calculate the future value of her loan and determine the amount of interest charged.
 3. Examine the effective rates for all of the options. Rank them from the best alternative to the worst alternative.
 4. Look at the amount of interest paid under the best alternative compared to the worst alternative. Express the worst alternative as a percentage of the best alternative.
 5. Summarize your findings for Katherine.

CHAPTER 10 CASE STUDY

How Much Interest Is Really Earned?

The Situation

Sharon works for Lightning Wholesale, which strongly encourages its employees to save up for retirement. After learning on June 1, 2006, that the company matches dollar for dollar any employee investments into their RRSPs, she has been pursuing her RRSP actively.

Sharon soon figured out one important and often misunderstood fact about RRSPs. Though many people think of an RRSP as a financial tool, like a savings account, into which money is invested, she realized that an RRSP is actually a tax-sheltered environment. Within the RRSP you can invest your money into various financial tools to save your retirement income, and any interest or capital gains that are earned on these investments are not taxable. This is in contrast to investments held outside an RRSP environment; for the latter, all earnings are subject to annual income taxes. The financial tools available to an RRSP could include GICs, mutual funds, bonds, securities, trusts, gold bullion, and stocks, just to name a few. Sharon's portfolio happens to include CSBs, GICs, and strip bonds.

She is interested in learning how much money she has saved up by June 1, 2010, and how much of that money is actually real, inflation-adjusted growth in her savings. In other words, she wants to account for inflation and get an understanding of how much real interest beyond cost of living adjustments she has earned in her RRSP.

The Data

- Lightning Wholesale matches any employee investment in GICs dollar for dollar. For example, if Sharon's out-of-pocket investment consists of \$2,000 into a GIC, she in fact invests \$4,000 into the GIC—\$2,000 from her own pocket and \$2,000 from Lightning Wholesale.
- Lightning Wholesale matches any employee investment in strip bonds by providing enough money to purchase a second identical strip bond.
- On June 1, 2010, the market yield of strip bonds with 16½-year maturities was 6.5425%, 22-year maturities was 4.9855%, and 23½-year maturities was 4.8821%.
- Annual June to June inflation rates starting with June 2006 to June 2007 have been 2.19%, 3.13%,

–0.26%, and 0.96%.

- Sharon’s out-of-pocket investment history is as follows, by investment type:

Investment Type: Variable Rate GIC with Successive Annual Rates

Contribution Date	Amount	Frequency	Interest Rates
December 1, 2006	\$1,000	Annual on December 1	3%, 3.25%, 1.85%, and 0.4002%
February 1, 2007	\$1,000	One-time lump sum	2.95%, 3%, 3.05%, and 1.003%
March 1, 2007	\$1,000	Annual on March 1	3.1%, 2.5%, 1%, and 0.4004%
December 1, 2007	\$1,000	One-time lump sum	3.3%, 3.4%, and 3.5308%
February 1, 2009	\$1,000	One-time lump sum	1.75% and 1.9117%
December 1, 2009	\$1,000	One-time lump sum	1.75% and 1.9117%

Investment Type: Five-year Escalator GIC

Contribution Date	Amount	Frequency	Interest Rates
September 1, 2006	\$5,000	One-time lump sum	2%, 2.4%, 3%, 4.5%, and 7%

Investment Type: Strip Bond

Purchase Date	Face Value	Term	Market Yield
December 1, 2006	\$20,000	20-year	7.053%
June 1, 2007	\$25,000	25-year	6.5425%
December 1, 2008	\$15,000	25-year	5.9067%

Important Information

- Assume that inflation rates are constant throughout any given year.

Your Tasks

1. If Sharon wanted and was able to cash in all of her investments (with no penalty on any early redemptions), calculate the maturity value of all of her investments on June 1, 2010. Calculate the total interest earned across all investments.
2. Using the inflation rates, calculate the equivalent value of all her money placed into investments on June

1, 2010.

3. Calculate the difference between her actual maturity value and her inflation-adjusted principal. This is the real amount of interest that she has gained over the years.

7.

CHAPTER 11 CASE STUDY

Developing Product Payment Plans

The Situation

Lightning Wholesale works very closely with some of its smaller retailers, many of which are owned and operated by sole proprietors. These owners generally need assistance with their pricing and call on the staff at Lightning Wholesale to help develop promotional pricing plans and the amounts of the payments that can be advertised. Lightning Wholesale freely offers the help, since it means more sales and increased profits for the company.

Many of the requests are identical in nature, so the staff at Lightning Wholesale want to develop a payment plan chart for their ski product line. This chart is to illustrate both the three-month and six-month payment plan amounts that can be advertised at various interest rates.

The Data

- Lightning Wholesale has opted to only carry two ski brands in 2014: Ogasaka and Nordica.
- The list prices for Ogasaka and Nordica are \$829.95 and \$799.95, respectively.
- The typical monthly compounded interest rates charged by its retailers are 8%, 12%, 18%, and 28%.
- Lightning Wholesale recommends a 10% down payment on all finance plans for all of its retailers.

Important Information

- All retailers sell the skis at the list price.
- All ordinary payment plans are either three month or six month.
- Lightning Wholesale ignores sales taxes in its chart since every province has varying rates. The retailer can increase the payments in the payment chart by the appropriate sales tax.

Your Tasks

1. For both product lines and for each interest rate, develop both a three-month and a six-month payment

plan amount chart that the retailers can advertise that incorporates the required down payment. For these advertised amounts, assume the final payment remains the same as all other payments (in application, though, the retailers will need to be cautioned that the final payment may be different and adjusted as needed, to which Lightning Wholesale can provide the necessary information as required).

2. Retailers ask you how to adjust the advertised payment plan chart amounts if they decide to sell the skis for some price other than the list price. What would you recommend? Provide calculations to support your answer.
3. Some retailers charge different interest rates and want to know if it is possible to just proportionally adjust the payment plan chart. For example, if a retailer charges 25.5% interest, this approach would then be to increase the 18% payment by 75% of the difference between the 18% and 28% level. Can retailers adjust your payment plan table in this way? Provide calculations using the provided numbers to support your answer.
4. Some retailers offer up to 12-month payment plans and ask if it is possible to just take the three-month payment numbers and divide by 4, or take the six-month payment numbers and divide by 2 to arrive at the 12-month payment plan numbers. Can retailers adjust your payment plan table in this way? Provide calculations to support your answer.

8.

CHAPTER 12 CASE STUDY

Should You Go on Strike?

The Situation

It is time to negotiate a new contract with some of Lightning Wholesale's unionized employees. The company believes in dealing fairly with its employees. Based on the current economic environment, cost of living increases, and the financial health of the organization, management feels that the best it can offer is a 3% wage increase. From its own analysis, the union believes that the company is holding out and that a 5.5% wage increase is more than possible. Unfortunately, negotiations have broken down, and the union has turned to its employee group seeking strike action. The union is certain of achieving its wage increase through the strike action, though it advises the employees that they may need to go on strike for three months to achieve the goal. The employees are trying to figure out their best course of action—should they vote to go on strike or not?

The Data

- The typical employee in the unionized group currently earns \$48,000 per year, which is paid out at the end of every month equally.
- Six employees have five years until retirement.
- Eight employees have 10 years until retirement.
- Nine employees have 15 years until retirement.
- Seven employees have 20 years until retirement.

Important Information

- During the three months that employees would be on on strike, employees receive no wages from Lightning Wholesale.
- The time value of money is unknown, but employees have four annually compounded estimates of 6%, 5%, 4%, and 3%.
- Assume employees make their strike vote according to their best financial outcome.

- The decision to go on strike is determined by the majority vote.
- No future wage increases are important when making this decision to strike or not.

Your Tasks

The employees are uncertain of the time value of money, so they need to run a few scenarios. Perform steps 1 through 3 below using EACH of the time value of money estimates as a different scenario. Determine the outcome of the strike vote (go on strike or not go on strike).

1. Calculate the present value of the company offer for each of the employee groups.
2. Calculate the present value of the union increase for each of the employee groups.
3. Cast the votes according to your results and determine the strike vote outcome under each time value of money possibility.
4. Management is trying to figure out the most likely outcome of the strike vote so that they can adjust their bargaining strategy if necessary. Based on the completed scenario analysis, what outcome should management plan on?
5. From your scenario analysis, what are some key decision-making variables that the employees need to consider before casting a vote to go on strike?

9.

CHAPTER 13 CASE STUDY

Cash or Credit?

The Situation

Pay cash or take out a loan? That is the question the purchasing manager for Lightning Wholesale faces today. Lightning Wholesale needs to replace its fleet of 10 forklifts for its warehouse operations. After shopping around and putting out a request for quotes, it has chosen Combilift as its supplier. The purchasing manager for Lightning Wholesale has been informed that the company does have the cash available to pay off the debt immediately. Alternatively, Lightning Wholesale could take out a loan and finance the purchase. The purchasing manager wonders what recommendation she should make — pay cash or take the loan? She knows she will need to support this decision with facts to her superiors.

The Data

- The quote from Combilift for the fleet of forklifts was for \$225,000 inclusive of all taxes, delivery, and other costs.
- The purchase could be alternatively financed by taking out a loan with month-end payments over three years at 4.79% compounded monthly.
- Prevailing interest rates on three-year investments are sitting at 5.95% compounded annually.

Important Information

- Businesses have other considerations in making these decisions, such as interest expense deductions on loans or interest taxes payable on investments. For purposes of this analysis, though, focus solely on the financial decision being made, and do not factor these other components into the decision.

Your Tasks

1. Many people would not even consider taking the loan since they do not want to be paying interest on purchases. From a financial perspective, explain why this decision is not as simple as choosing not to pay

interest. (Hint: Think about the interest rate.)

2. Calculate the loan payment amount if Lightning Wholesale pursued the loan alternative. What would be the amount of the final loan payment?
3. If Lightning Wholesale wanted to invest a single amount of money today to make the payments on the loan, what amount today must be invested? (Hint: Calculate the present value of the loan payments using the investment rate of return.)
4. Based on your calculations, what should the purchasing manager recommend? How much better is the chosen alternative in today's dollars?
5. Can you develop a general rule (exclusive of other considerations) to help decide more easily between paying cash or financing? (Hint: Try the above calculations using a loan rate of 6.79% instead of 4.79% and see what decision is made.)

10.

CASE STUDY SOLUTIONS

Solutions to the case studies can be found in the ancillary resources only available to instructors. Please contact eCampusOntario to access these solutions.