

Engineering Economics and Problem Solving, 4N4, 2013

Tutorial/Assignment 1

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This tutorial, and also your first assignment, has two goals: to get you started with economic concepts and to illustrate the purpose of self-directed learning (SDL). We will emphasize self-directed learning several times during the term.

Throughout your career you will have to learn new ideas and tools that you were never taught in school or university. We are going to start off this assignment/tutorial learning about one of the most important topics: your financial well-being, which obviously requires some economic understanding. Making good economic decisions for yourself is as important as making economic decisions for your employer.

At 30 minutes before the end of the tutorial time, a representative from your group will be asked to present their answers to the class on each question. Everyone in the group must be prepared to present the group's solution to the class.

Ice-breaker questions within your group

- introduce yourself to your other group members; *then*
- tell each other the one most interesting thing you learned during the summer, *or*
- tell each other what you like to do in your free time.

Question 1

What is the average Canadian's debt-to-income ratio? Explain what this means in your own words.

Read [this article](#) either before or after the tutorial, for a different context of this ratio that is more relevant to your current situation.

Question 2

What is the median income of a person in Hamilton? State your source and date for your data.

Question 3

When did Canada first introduce a pension system? State your source; what conflicting information did you find when researching this question.

Question 4

When you start working after graduation you will either be offered:

- no pension plan (usually for contract or part-time work)
- a defined contribution (DC) plan
- a defined benefit (DB) plan

Now answer:

1. What percentage of Canadians have defined benefit plans?
2. For a DB plan: what factors influence how much money you will receive when you retire?

3. For a DC, what happens on the day you retire?
4. If the stock market goes into a prolonged stagnation during the years while you are working (e.g. like Japan has experienced for the past 11 years), which plan has the greater risk of not meeting your retirement needs?

Question 5

Assume you were born in 1991 (which should be about right for most of you). What is the probability (as a percentage) that:

- you will live to age 70, in Ontario, if female
- you will live to age 80, in Ontario, if female
- you will live to age 90, in Ontario, if female
- you will live to age 70, in Ontario, if male
- you will live to age 80, in Ontario, if male
- you will live to age 90, in Ontario, if male

Question 6

List all sources of income that are will be available to you as a Canadian citizen (no need to calculate amounts, just identify the sources) during your retirement. Assume that you worked for a company with a defined benefit plan for the first part of your career, and another company with a defined contribution plan for the last part of your career.

Question 7

- What's the average retirement age in Canada?
- What would be a reasonable number of years to aim to save money for, to sustain you from the day you retire?
- The year before your retire you will be earning $\$X$ of income. When you retire you require less money, e.g. you don't need to save money anymore for retirement, you probably require fewer clothes, and commuting costs are much lower, *etc.* What fraction of pre-retirement income do pension planners use, as a rule-of-thumb, to estimate your income requirements during retirement; e.g. $0.4X$, $0.5X$.
- Given your answers above, now calculate an estimate of the total amount of money that would be required during the entire retirement duration, if $\$X = \$100,000$.
- Is anything missing in the above estimate? (*Hint*: does the fraction remain constant? *Bonus*: what fraction do retirement planners consider normal for the first year or two of retirement?)

Question 8

What are good sources of information to keep reading during your lifetime that inform you about retirement issues, and planning for income during your retirement?

Question 9

Let's understand a bit about taxation in Canada.

If you earn an income of $\$100,000$ from your employer, with no other sources of income, or other special deductions, use a 2012 T1 tax return form and its relevant schedules, to find:

1. What will be the amount of **federal** tax that you pay?
2. What will be the amount of **provincial** tax that you pay, assuming you live in Ontario?
3. What is the Ontario Health Premium amount for this level of income?
4. All real tax returns will have additional credits and other charges, but given the above situation, what is this person's overall tax rate?

Question 10

Consider the case of using an RRSP as one option to save for retirement. An RRSP allows you to invest in mutual funds, stocks, and other investments. Let's take a look at how an RRSP might help you.

- What does RRSP stand for?
- If the person in the previous question contributed \$10,000 to an RRSP during the 2012 RRSP contribution period, how does it change the tax calculations made in the previous question?
- We hear about people "maxing out their RRSP". What is the maximum amount this person could contribute to their RRSP in 2012?
- Why do you think the government allows RRSP deductions? Do they ever make this lost revenue back?

Question 11

- What does TFSA stand for?
- If you filed a tax return in 2009, 2010, 2011, and 2012 then you are eligible to put money into your TFSA, even retroactively, for all 4 years. In other words, your contribution amount gets carried forward. In this scenario, what is the maximum amount you could have invested?
- What is main distinguishing feature between a TFSA and an RRSP?

Question 12

For the previous questions on RRSPs and TFSAs we said you can buy "investments" and "funds" for these accounts.

- Where do you buy these stocks and investments?
- Where are they held?
- Write a bullet point list of things you need to do to open a stock-market investment account.

END