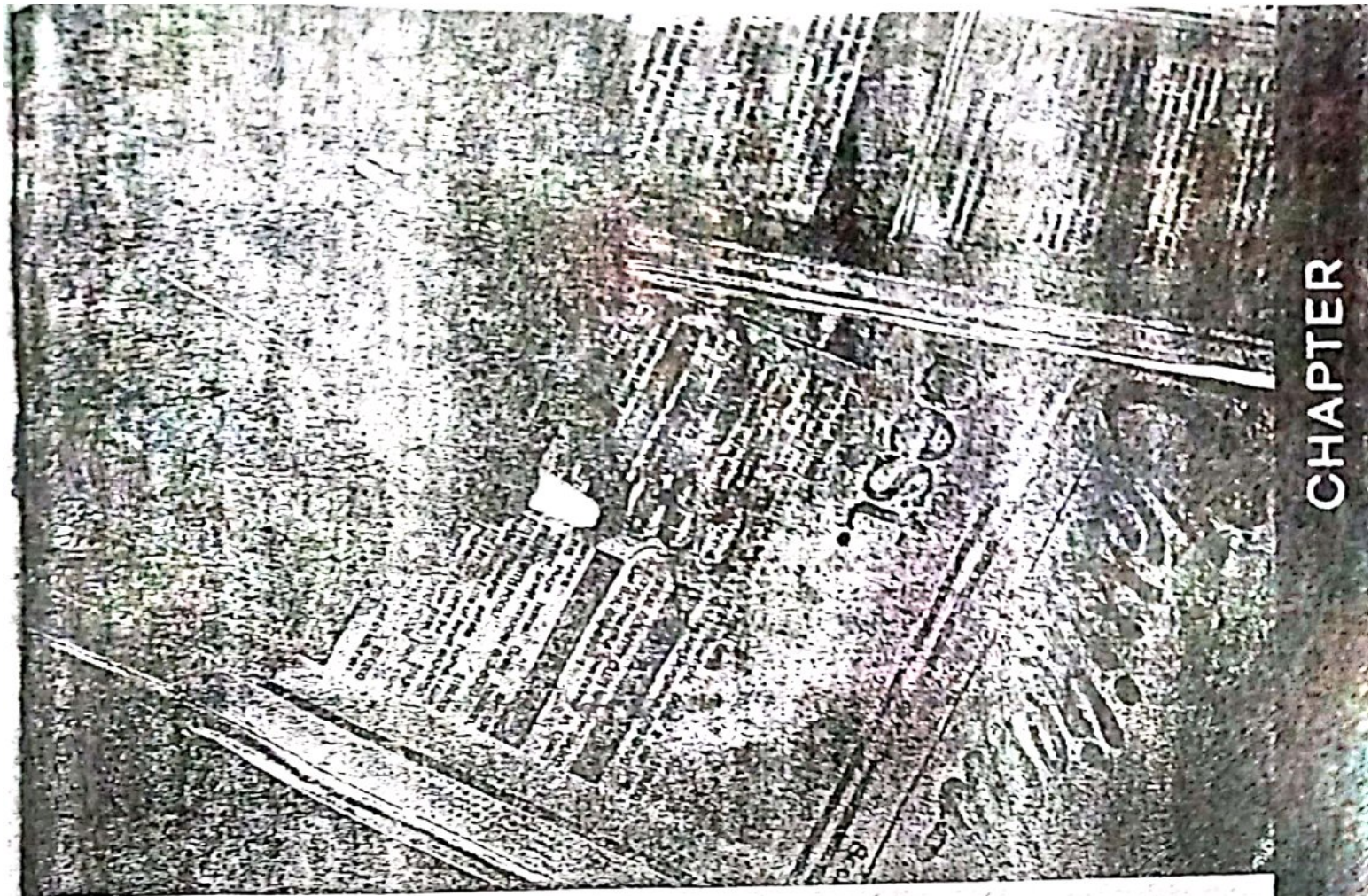

CHAPTER

Inflation and Unemployment [8-9]

Ask a Canadian in the workforce what economic prospect concerns them most, and the answer will likely be unemployment. Ask a pensioner the same question, and chances are the answer will be inflation. Our anxiety over these two economic evils is not misplaced; in fact, price stability and full employment are among Canada's most important economic goals. This chapter explores the effects of a trend of rising prices, how the trend is measured, and how it often most hurts those who can afford it least. We will also examine unemployment: how it is measured and its costs not only for individuals, but for the entire economy.

> Unemployment and inflation still preoccupy and perplex economists... and everyone else.
>
> – JAMES TOBIN, AMERICAN ECONOMIST

LEARNING OBJECTIVES After this chapter, you will be able to

LO 1

Define inflation, describe how it is measured, and explain its effect on nominal and real incomes.

LO 2

Identify the official unemployment rate and the different types of unemployment, and define full employment.

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LO1 Inflation, as introduced in Chapter 1, is a general increase in the prices of goods and services in an entire economy over time. **Suppose, for example, that Canada has an annual inflation rate of 3 percent this year. Inflation does not mean that all prices are rising. Some prices are rising, others are remaining constant, while still others may be falling; however, the overall rise in prices is 3 percent.** In exceptional cases—most notably during the 1930s—prices may remain constant, in which case the inflation rate is zero, or there may be a general decline in prices. A general decrease in the level of prices is called **deflation**. Finally, a situation in which inflation is out of control, and prices increase rapidly—at double digits or even triple digits per month—is known as **hyperinflation**. A recent example occurred between 2007 and 2009 in the African country of Zimbabwe. During these years, the percentage rise in prices in Zimbabwean dollars rose into the millions. In April 2009, the country's currency was finally abandoned, which meant that the country had to turn to other currencies, such as the South African rand and US dollar, to use as money. To explain why Canadian governments stress the goal of price stability, let us first examine inflation in detail, how it is measured, and its implications for the economy. We will leave a discussion of its causes to a later chapter (Chapter 13), at which point we will explore the variety of possible causes of inflation—either through increases in demand for an economy's goods and services (known as demand-pull inflation), or through increases in costs (known as cost-push inflation).

deflation: a general decrease in the level of prices

hyperinflation: a situation in which prices increase rapidly and inflation is out of control

The Consumer Price Index

The tool most commonly used to measure overall changes in prices is the **consumer price index** (CPI). This index monitors price changes in a representative "shopping basket" of consumer products. Statistics Canada surveys typical Canadian households' buying habits every few years so that it can determine what they buy.

consumer price index: a measure of price changes for a typical basket of consumer products

A simple illustration, as given by Figure 9.1, shows how the consumer price index indicates price changes: Suppose the shopping basket includes only two items—hamburgers

FIGURE 9.1 Simple Consumer Price Index

Result of 2011 Survey

	Prices	Quantity Consumed per Month	Expenditure per Month	Weights
Hamburgers	$2.00	10	$20	$20 ÷ $50 = 0.4
Milkshakes	$1.00	30	$30	$30 ÷ $50 = 0.6
			$50	

Prices in 2012

	Prices	2012 Price 2011 Quantity
Hamburgers	$2.20	$2.20 × 10 = $22.00
Milkshakes	$1.05	$1.05 × 30 = $31.50
		$53.50

In this simplified economy, 10 hamburgers and 30 milkshakes fill the monthly shopping basket of an average consumer. If the value of this basket rises from $50 to $53.50 during the course of a year, the annual inflation rate is 7 percent, with the consumer price index moving from 100 to 107.

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and milkshakes. An investigator conducting a survey in 2011 finds that each month, an average consumer buys 10 hamburgers at $2 each and 30 milkshakes at $1 each. In other words, the typical consumer spends $20 on hamburgers and $30 on milkshakes, for a total of $50 per month. Therefore, two-fifths (0.4) of the consumer's total budget is spent on hamburgers and three-fifths (0.6) on milkshakes. These fractions represent the **item weights**, or proportions of each good in the total cost of the shopping basket.

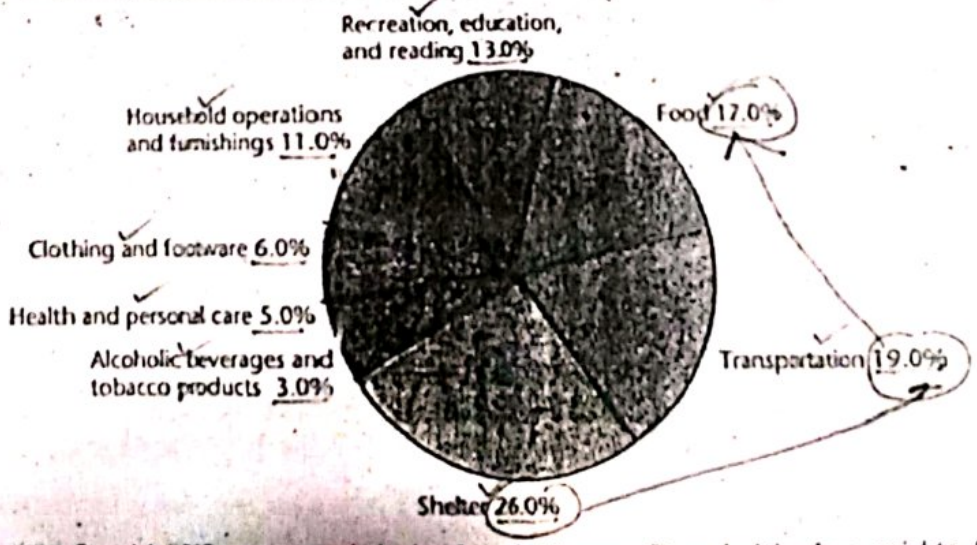
item weights: the proportions of each good in the total cost of the basket of consumer goods used to calculate CPI

To give a point of comparison for prices in subsequent years, the year in which the survey is conducted acts as the **base year**. The combined price of the representative products in the base year is considered the reference point, and the index in the base year is set at 100. Suppose, in our example, that the prices of hamburgers and milkshakes rise to $2.20 and $1.05 in 2012. On the basis of the quantities determined by the 2011 survey, the amount spent each month on hamburgers and milkshakes can be calculated. In other words, the same quantity of hamburgers at the new hamburger price (= 10 × $2.20) and the same quantity of milkshakes at the new milkshake price (= 30 × $1.05) give a total cost of $53.50 (= $22 + $31.50). Compared with the 2011 total cost ($50) of the same products, prices have risen by $3.50 (= $53.50 − $50.00) or 7 percent from the base year [= (3.50 ÷ $50) × 100]. Hence, the 2012 consumer price index is 107.

base year: the survey year used as a point of comparison in subsequent years

While it includes many more items, Statistics Canada calculates the actual CPI in the same way. Figure 9.2 shows the item weights for the major components of the CPI. Every month, the prices of about 600 representative products included in the CPI shopping basket are measured in a variety of Canadian communities. The index is calculated from the results. In the typical case of rising prices, the percentage increase in the consumer price index represents the inflation rate. For example, if the CPI has a value of 100 at the end of one year and a value of 110 at the end of the next year, the inflation rate over the year is 10 percent. In other words, the change in the index (= 110 − 100), expressed as a percentage [= (10 ÷ 100) × 100], is the inflation rate (10 percent).

FIGURE 9.2 Consumer Price Index Weights (2005)



According to Statistics Canada's 2005 survey, a typical urban household's expenditures had the above weights. As shown, shelter was the biggest expenditure, followed by transportation and food.

Source: Statistics Canada "Consumer Price Index Weights (2005)," adapted from the Statistics Canada Database (Definitions, data sources, and methods), Record No. 2301, http://www.statcan.gc.ca/pub/62-553-x/2011000/document/2301_DM_T9_V1_B.pdf. Retrieved May 31, 2011.

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cost of living: the amount consumers must spend on the entire range of goods and services they buy

nominal income: income expressed in current dollars

real income: income expressed in constant base-year dollars

NOMINAL VERSUS REAL INCOME

The consumer price index is useful in helping consumers determine the cost of living or the amount they must spend on the entire range of goods and services they buy. In particular, the CPI allows consumers to judge how much better or worse off they are as a result of inflation. Suppose, for example, a consumer's monthly income increases from $1000 to $1050 during a year when the CPI rises from 100 to 110. If the consumer's own monthly purchases roughly correspond to those in the representative "shopping basket," he can evaluate the personal impact of inflation. To see how this consumer's purchasing power is affected by inflation, we can express his **nominal income**, or income valued in current dollars, as a **real income**, or income expressed in constant base-year dollars. To determine real income for a given year, divide the consumer's nominal income ($1050) by the value of the consumer price index for that year, expressed in hundredths (1.10):

$$\text{real income} = \frac{\text{nominal income}}{\text{CPI (in hundredths)}}$$

$$\$954.55 = \frac{\$1050}{1.10}$$

In other words, the consumer's monthly income of $1050 has a purchasing power of $954.55 when valued in constant base-year dollars. His income has not increased proportionally with the cost of living. For the consumer's purchasing power to keep up with inflation, his income would have to increase by the same percentage as the increase in prices—that is, by 10 percent, or $100 (= $1000 × 0.10), to $1100 (= $1000 + $100).

As our example shows, the purchasing power of a current dollar is inversely related to the consumer price index: the lower the CPI, the higher the purchasing power of nominal income; and the higher the CPI, the lower the purchasing power of nominal income. Therefore, those whose incomes increase at a higher rate than the rise in prices have a higher standard of living. On the other hand, those whose incomes increase at a lower rate than the rise in prices are worse off than before.

(a) real income rises when rate of increase of nominal income > rate of inflation

(b) real income remains the same when rate of increase of nominal income = rate of inflation

(c) real income falls when rate of increase of nominal income < rate of inflation

Limitations of the CPI

As with any economic indicator, the consumer price index has a number of limitations. In this case, they are: consumer differences, changes in spending patterns, and product quality or the introduction of new products. In some circumstances, these limitations can severely reduce the index's usefulness.

CONSUMER DIFFERENCES

Individual consumption patterns do not always match those of the typical urban household. Hence, the consumer price index may not apply to many consumers' individual cost of living. Consider, for example, a fashion-conscious reader of romance novels. This person tends to spend a larger proportion of her budget on clothing and books than the typical consumer, and consequently might travel less than the average consumer. For this individual consumer, the official index understates the impact of price changes in clothing and books, but overstates the impact of price changes in travel fares.

CHANGES IN SPENDING PATTERNS

Statistics Canada periodically surveys households to update both the contents and the item weights of the "shopping basket." But these statistical changes occur relatively infrequently

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prices rise very little, or even decrease, consumers will likely choose to buy more. For example, more cell phones were steadily purchased in the early 2000s, as their prices fell. Over time, these products have too low a weight in the CPI basket, so that the index overstates the rate of inflation. In contrast, consumers tend to buy fewer items whose prices rise the most. Over time, these products have too high a weight in the CPI basket, meaning the index again overstates the rate of inflation.

PRODUCT QUALITY AND NEW PRODUCTS

The index cannot reflect changes in quality, or the introduction of new products, that are unmatched by changes in price. For example, items in the CPI shopping basket, such as medicines and flat screen TVs, may improve tremendously in quality, yet their prices may not increase proportionally with quality, and may even fall. Similarly, new products such as digital music players might replace older products that had higher prices. So, while the standard of living may increase because of increased product quality or new products, this will not be reflected in the CPI.

Over time, Statistics Canada tries to adjust the items in the index to account for these quality improvements, but it is difficult to do so completely. As with changes in spending patterns, the result is that the CPI overstates the rate of inflation—by a total amount of about 0.5 percent a year, according to Canadian estimates.

The GDP Deflator

Another indicator of price changes is the **GDP deflator**. Unlike the CPI, which focuses on a small number of consumer items, the GDP deflator measures price changes for all goods and services produced in the economy and weights them in terms of the economy's total output. The item weights in this index are altered yearly, depending on how goods and services are represented in current GDP. While subsequent updating increases the accuracy of the GDP deflator, it means that values for this index are not as quickly available as values for the consumer price index. Because of this drawback, the GDP deflator receives less publicity than the CPI. Given the difference in the way they are calculated, the two indicators give similar but not identical estimates of inflation.

price changes for all goods and services produced in the economy

Statistics Canada now uses an intricate mathematical method known as chaining to calculate the GDP deflator, as outlined in the article "Linking the Chain" available at the book's Online Learning Centre (www.mcgrawhill.ca/olc/lovewell). This method can be approximated as outlined in Figure 9.3, which shows how a GDP deflator can be calculated in a simplified economy that produces only computer microchips. In 2011, which is the reference year, the GDP deflator is equal to 100. To calculate the value of the GDP deflator in each subsequent year, multiply the output of each year by the current price per microchip, divide by the same output in reference year prices, and then multiply by 100. For example, the 2012 output of microchips is 2000 and the price is 30 cents. Divide this \$600 value of output (= 2000 × \$0.30) by the same output in 2011 prices (= 2000 × \$0.20), or \$400, to give a GDP deflator of 150 [= (600 ÷ \$400) × 100]. The result shows that the general price level has risen by one-half between 2011 and 2012. In other words, the inflation rate was 50 percent.

NOMINAL VERSUS REAL GDP

Just as nominal incomes for an individual household can be adjusted to take price changes into account, so can the value of the economy's entire output be adjusted for inflation. Recall that **real GDP** (or real output) is GDP expressed in constant dollars from a chosen reference year. In contrast, **nominal GDP** (or nominal output) is GDP expressed in current

nominal GDP: Gross Domestic Product expressed in current dollars

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(1) Year	(2) Output of Microchips	(3) Current Price	(4) Output at Current Price (2) × (3)	(5) Output at 2011 Price (2) × $0.20	(6) GDP Deflator [(4) ÷ (5)] × 100
2011	1000	$0.20	$200	$200	100
2012	2000	0.30	600	400	150
2013	2500	0.40	1000	500	200

To calculate the GDP deflator in any year, take the economy's annual output at current prices (column 4), divide by this same output valued at reference-year prices (column 5), and then multiply the result by 100. While the GDP deflator has a value of 100 in 2011, which is the reference year, it rises in proportion with the prices of the economy's output.

dollars. Recall also that real income for the individual household measures the purchasing power of that household over time. In the same way, real GDP gives an indication of the purchasing power of an entire economy. To find real GDP, economists and statisticians divide nominal GDP by the GDP deflator expressed in hundredths:

$$\text{Real GDP} = \frac{\text{nominal GDP}}{\text{GDP deflator (in hundredths)}}$$

This formula can be applied to Canada's GDP, as Figure 9.4 shows, to give GDP in constant reference-year (2002) dollars. Canada's nominal GDP was $1621.5 billion in 2010. This amount divided by the GDP deflator expressed in hundredths, which was 1.22372 (= 122.372 ÷ 100), gives a real GDP of $1325.1 billion (= 1621.5 billion ÷ 1.22372). The same approach can be used for years prior to the reference year. For example, Canada's 1997 nominal GDP was $882.7 billion. This amount divided by the GDP deflator expressed in hundredths, which is 0.92728 (= 92.728 ÷ 100), gives a real GDP for 1997 expressed in 2002 dollars, of $951.9 billion (= $882.7 billion ÷ 0.92728). Notice that when the adjusting number is more than 100, as in 2010, nominal GDP is reduced or deflated to find real GDP. In the opposite case, where the index falls short of 100, as in 1997, nominal GDP is expanded or inflated when this adjustment is made.

FIGURE 9.4 Finding Real Gross Domestic Product

(1) Year	(2) Nominal GDP (current $ billions)	(3) GDP Deflator (2002 = 100)	(4) Real GDP (2002 $ billions) [(2) ÷ (3)] × 100
1997	$882.7	92.728	$951.9
2002	1152.9	100.000	1152.9
2010	1621.5	122.372	1325.1

To find Canada's real GDP in any year, divide the economy's nominal GDP, which is expressed in current dollars, by the value of the GDP deflator. While Canada's nominal output rose from $882.7 to $1621.5 billion between 1997 and 2010, the nation's real output in 2002 dollars increased by a much smaller amount, from $951.9 to $1325.1 billion.

Sources: Statistics Canada "Finding Real Gross Domestic Product," adapted from the Statistics Canada CANSIM II database, http://cansim2.statcan.gc.ca, Table 380-0017, V3839799 and V3839800, and Table 380-0056, V3862688. Retrieved April 2, 2011.

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Inflation's Effects (mmy pgs. 261-262)

Once the nominal interest rate has been agreed upon, it is fixed. So, lenders try to anticipate the rate of inflation for the loan period and build it into the nominal interest rate. This rate built into the nominal interest rate is known as the **inflation premium**. Lenders, therefore, determine what real interest rate they desire and add an inflation premium to determine the nominal interest rate:

inflation premium: a percentage built into a nominal interest rate to anticipate the rate of inflation for the loan period

$$\text{Nominal interest rate} = \text{desired real interest rate} + \text{inflation premium}$$

For example, the manager at Mariposa Vacations' bank may have anticipated a 2 percent inflation rate and wanted a real interest rate of 5 percent. So, on the $2000 one-year loan, she expected the bank would receive real interest of $100 (= $2000 × 0.05) and an inflation premium of $40 (= $2000 × 0.02) to compensate for the reduced purchasing power of the original $2000 principal.

What happens if the inflation rate turns out to be higher than lenders anticipated? Suppose, in our example, the inflation rate is actually 4 percent instead of 2 percent. As a result, the bank actually receives only 3 percent real interest—that is, the 7 percent nominal rate minus the 4 percent inflation rate. This is less than the 5 percent real interest rate the bank manager anticipated. Because the inflation rate is higher than anticipated, the real interest rate is lower than the desired real interest rate, and lenders are worse off, while borrowers are better off. On the other hand, if the inflation rate is less than anticipated, the real interest rate is higher than the desired real interest rate, and lenders are better off, while borrowers are worse off. Only when the inflation rate is exactly as anticipated will the real interest rate be the same as the desired real interest rate, so that lenders and borrowers are unaffected by inflation.

THINKING ABOUT ECONOMICS

Why is inflation much more common than deflation?

Like inflation, deflation arbitrarily redistributes purchasing power—though in ways opposite to inflation. More importantly, deflation can feed on itself. When the general price level falls, households may delay purchases as they expect further price declines. With less spending in the economy, prices do tend to fall an extra amount. As a result, households postpone spending even longer, which risks causing a potentially sharp and painful downturn in economic activity. To forestall such self-building cycles of delayed spending, central bankers generally do all they can to avoid even small amounts of deflation. As well, even deflation restricted to certain important markets—such as real estate or financial assets—tends to be monitored closely by policy-makers to ensure that such trends do not cause a more general deflationary spiral. In the aftermath of the credit crunch in 2008, for example, fears of deflation became pronounced—especially in those countries where spending shrank the most. In the United States and parts of Europe, facing significant slumps in both real estate and financial markets, the world's main central banks made it clear that they were on the lookout for deflation and were prepared to fight it with all the policy tools at their disposal.

QUESTION Who is helped and who is harmed by deflation?

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- The extent to which inflation affects individuals' purchasing power varies. Those people whose incomes are fully indexed to inflation rates maintain purchasing power. However, those with partially indexed or fixed incomes lose purchasing power.
- Lenders also lose from inflation if inflation is higher than they anticipated with the inflation premium.

9.1 PRACTICE QUESTIONS

1. The following table shows a consumer's weekly purchases during 2011 and 2012.

Consumer's Weekly Purchases

	Prices		Quantities Consumed per Week	
	(2011)	(2012)	(2011)	(2012)
Hamburgers	$2.50	$2.75	5	4
Bottles of cola	1.25	1.30	10	11

a. Calculate the value of the consumer's 2011 shopping basket using first 2011 and then 2012 prices.
b. If 2011 is used as the base year, what is the 2011 value of the consumer's price index? the 2012 value?
c. Using 2011 as the base year, what is the inflation rate between 2011 and 2012?

2. Fill in the blanks in the table for a hypothetical economy.

Year	Nominal GDP (current $ billion)	GDP Deflator	Real GDP (2010 $ billions)
2009	$_____	97.458	$210.7
2010	234.3	_____	_____
2011	245.9	101.340	_____
2012	258.7	_____	251.3
2013	_____	105.438	261.4

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For example, Canada's 2010 labour force of 18.5251 million people was composed of 17.041 million people who were employed and 1.4841 million who were not. Therefore, the unemployment rate was 8.0 percent:

$$\text{Unemployment rate} = \frac{\text{unemployment labour force}}{\text{labour force}} \times 100$$

$$8.0\% \doteq \frac{1\ 484\ 100}{18\ 525\ 100} \times 100$$

Figure 9.7 summarizes the relationships among Canada's population, labour force, labour force population, and unemployed labour force. Further practice related to these relationships can be found in the simulation accompanying this chapter at the book's Online Learning Centre.

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Drawbacks of the Official Unemployment Rate

Because of the way the official unemployment rate is calculated, it may either understate or overstate the true level of unemployment in the Canadian economy. Critics of this official rate point to the following factors: underemployment, discouraged workers, and dishonesty.

UNDEREMPLOYMENT

The official unemployment rate makes no distinction between part-time and full-time employment, nor does it reflect the appropriateness of the work. While some part-time workers prefer part-time work, others would want full-time work if it were available. Also, in hard times, some workers may have to work at jobs that do not fully utilize their skills and education. Thus, we have the problem of **underemployment**. It is sometimes argued that the official rate understates unemployment by ignoring underemployed workers.

underemployment: the problem of workers being underutilized, either as part-time workers or by working at jobs not appropriate to their skills or education

DISCOURAGED WORKERS

Unemployment statistics also do not take into account people who, after searching for a job without luck, give up looking. Because they are not actively seeking employment, these **discouraged workers** are not considered part of the labour force. Again, it is sometimes argued that this causes the official rate to understate unemployment.

discouraged workers: unemployed workers who have given up looking for work

The number of underemployed and discouraged workers rises during an economic downturn, since job prospects—especially for full-time work—are at their bleakest. During the recession of the early 1990s, for example, estimates suggested that underemployed and discouraged workers would have added up to 10 percent to the official unemployment rate. At other times, adding these groups to the official rate would result in a smaller increase—about 3 percent for underemployment and discouraged workers combined.

DISHONESTY

People responding to Statistics Canada's labour market survey may state that they are actively looking for work when, in fact, they are not. While the extent to which such dishonesty affects the unemployment rate is difficult to measure, it does make it possible for the official rate to overstate unemployment.

Types of Unemployment

When examining unemployment, we should distinguish among four types: frictional, structural, cyclical, and seasonal unemployment.

FRICTIONAL UNEMPLOYMENT

Workers who are temporarily between jobs or have begun looking for their first jobs are experiencing **frictional unemployment**. A dental assistant who has left one job voluntarily to look for another and a recent college graduate looking for career-related work are examples. Frictional unemployment is a permanent feature of labour markets and represents about 3 percent of the labour force at any given time.

frictional unemployment: unemployment due to being temporarily between jobs or looking for a first job

STRUCTURAL UNEMPLOYMENT

Another type of unemployment is closely connected to structural trends in the economy. **Structural unemployment is due to a mismatch between people and jobs—unemployed workers cannot fill the sorts of jobs that are available.** This type of unemployment **occurs primarily because of gradual changes in the economy.** Long-term adjustments **in what items are produced (for example, the current shift from goods to services), how they are produced (largely due to technological change), and where they are produced cause such unemployment**

structural unemployment: unemployment due to a mismatch between people and jobs

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Because of these changes, workers lose out; they are displaced. Consider a worker who loses her job in manufacturing because of automation. She might not yet have the skills for the expanding service sector. In the same way, an unemployed fisherman living in a remote village cannot easily take advantage of employment opportunities elsewhere. Because gaining new skills, moving to obtain work elsewhere, and developing new industries in a region all take time, structural unemployment can persist for long periods.

CYCLICAL UNEMPLOYMENT

cyclical unemployment: unemployment due to fluctuations in output and spending

Economies and businesses must cope with fluctuations in output and spending, causing unemployment to rise and fall. This type of unemployment is called **cyclical unemployment**. An auto worker, for example, may work overtime in periods of strong consumer demand for cars, but be laid off in leaner times.

SEASONAL UNEMPLOYMENT

seasonal unemployment: unemployment due to the seasonal nature of some occupations and industries

In some Canadian industries—agriculture, construction, and tourism, for example—work is seasonal, with lower employment in the winter months. As a result, some workers experience **seasonal unemployment**. Compared with many other countries, seasonal unemployment is particularly significant in Canada, given its climate and the importance of its primary resource industries. So that month-to-month comparisons can be made without the influence of seasonal unemployment, Statistics Canada calculates seasonal changes and adjusts the official unemployment rate accordingly.

Full Employment

full employment: the highest reasonable expectation of employment for the economy

Defining **full employment** is a tricky task. In effect, full employment is the highest reasonable expectation of employment for the economy as a whole, and is defined in terms

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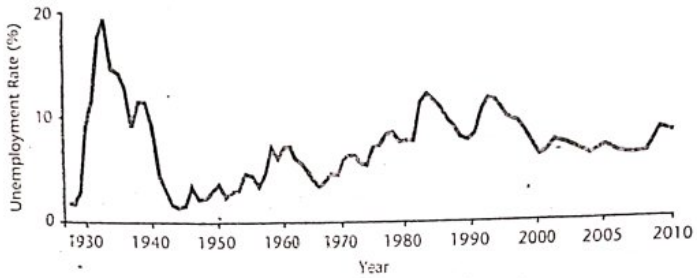
FIGURE 9.8 The Unemployment Rate



After rising significantly in the 1930s, the unemployment rate fell to 2 to 4 percent for much of the 1940s and 1950s. Since the late 1950s, the rate has gradually risen. Much of this increase can be attributed to a rise in natural unemployment.

Sources: Statistics Canada "Unemployment Rates by Province, Gender, and Age (2007)," adapted from the Statistics Canada Summary Table, http://www40.statcan.gc.ca/l01/cst01/econ10-eng.htm. Retrieved April 2, 2011.

STRUCTURAL CHANGE

Recall that structural adjustments in an economy occur whenever there are changes regarding what products are produced, as well as in how and where they are produced. Over the past few decades, the pace of structural change in the Canadian economy has accelerated. The growth of the service sector and shrinking of the traditional manufacturing sector, the rise of the new economy, and the removal of many international trade barriers have each led to the displacement of workers and, therefore, pushed up long-term structural unemployment.

UNEMPLOYMENT INSURANCE

Most unemployed workers today have a significant advantage over those in previous generations. The financial cushion provided by unemployment insurance allows job seekers to devote more time and effort to searching for employment than in the past, which increases frictional unemployment. Reforms to unemployment insurance in the early 1970s also made it easier for those experiencing seasonal and structural unemployment to claim benefits. Thus, unemployment insurance can be a factor in increasing the unemployment rate. Overall, it is estimated that this factor has added between 0.5 percent and 2 percent to the unemployment rate since the 1970s. However, more recent changes to the unemployment insurance system (now called Employment Insurance) have made it more difficult to claim benefits, reducing this effect.

CHANGING PARTICIPATION RATES

Recall from Figure 9.6 that over the last few decades, young people have added to the labour force. Not only do they add to the supply of unskilled labour when they first enter the labour force, but as they acquire skills and work experience, they also suffer greater frictional unemployment than more experienced workers. As a result, the increased participation rates among young Canadians (which declined for a while in the 1990s) has swelled the ranks of the unemployed.

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THINKING ABOUT ECONOMICS

Are the Canadian and US unemployment rates directly comparable?

There are important differences in the way the unemployment rate is calculated in each country, which means that the Canadian rate would be lower if computed using US definitions. For example, a job-seeker who consults just one job ad a month would be classified as actively seeking employment (and hence officially unemployed) in Canada, but not in the US. Statistics Canada takes these measurement differences into account by occasionally publishing a Canadian unemployment rate calculated using US definitions. The resulting figure is anywhere up to a percentage point below the rate determined using the Canadian definitions.

QUESTION Given these measurement differences, is the US natural unemployment rate likely to be above or below that in Canada?

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1. The table below gives data on Student A's monthly purchases during 2011 and 2012.

Student A's Monthly Purchases

	Prices		Quantities Consumed per month	
	(2011)	(2012)	(2011)	(2012)
Hotdogs	$1.50	$1.60	3	2
Cans of cola	.75	.70	16	18
Chocolate bars	1.00	1.00	7	7
Magazines	3.50	4.50	3	2
DVD rentals	3.00	2.75	2	3

a. Calculate the value of Student A's 2011 shopping basket using 2011 prices. What are the item weights associated with this shopping basket?
b. Calculate the value of Student A's 2011 shopping basket using 2012 prices. If 2011 is used as the base year, what is the 2012 value of Student A's price index? What is the 2011 value of this index? By what percentage has this index changed between 2011 and 2012?

2. The table shows output and prices during 2012 in an economy that produces only two goods—sweatshirts and bags of chips.

Finding the GDP Deflator

	Output in 2012	Prices in 2012	Prices in 2011
Sweatshirts	4	$22.00	$16.00
Bags of chips	50	1.80	1.50

a. What is the total value of the economy's output in 2012 valued in 2012 prices?
b. What is the total value of the economy's output in 2012 valued in 2011 prices?
c. On the basis of your answers to parts a and b, calculate the value of the GDP deflator in 2012 if 2011 is treated as the reference year.
d. In what ways does the calculation of the GDP deflator differ from the calculation of the consumer price index?

3. a. Copy and complete the table below.

Finding Real Gross Domestic Product

Year	Nominal GDP (current $ billion)	GDP Deflator	Real GDP (2002 $ billions)
1996	$_____	91.6	$913.4
1999	982.4	93.9	_____
2002	1152.9	_____	_____
2005	1373.8	110.1	_____
2008	1599.6	_____	1318.1

Sources: Statistics Canada "Finding Real Gross Domestic Product," adapted from the Statistics Canada CANSIM II database, http://cansim2.statcan.gc.ca, Table 380-0017, V3839799 and V3839800, and Table 380-0056, V3162688. Retrieved April 2, 2011.

b. Explain why real GDP is less than nominal GDP in some years, and greater than nominal GDP in other years.

4. Outline how each of the following individuals is influenced by unexpected inflation:
a. a lawyer whose costs and revenues both rise by the inflation rate
b. the owner of a heavily indebted restaurant

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c. a worker with a union contract that includes a COLA clause
d. an injured worker who lives on a partially indexed pension

5. For each of the following years, determine the real interest rate. Find the difference between this rate and the desired real interest rate, and explain how any difference affects borrowers and lenders.
   a. In year 1, the nominal interest rate is 9 percent, the inflation premium on loans is 3 percent, and actual rate of inflation is 4 percent.
   b. In year 2, the nominal interest rate is 10 percent, the inflation premium is 4 percent, and the actual rate of inflation is 2 percent.
   c. In year 3, the nominal interest rate is 8 percent, the inflation premium is 2 percent, and the actual rate of inflation is 2 percent.

6. The relationship between nominal and real interest rates continues to hold when there is deflation rather than inflation, except that the overall change in prices is now negative. For example, take the case where the desired real interest rate is 3 percent, the expected deflation rate is −2 percent, and the actual deflation rate is −3 percent. What is the nominal interest rate? the actual real interest rate? If the reduction in prices is greater than expected, do borrowers or lenders benefit? Explain.

7. The table below includes hypothetical labour force data.

Finding Participation and Unemployment Rates

	2011	2012
Total population 15 years and over	4.2 million	4.2 million
Those 15 years and over not in the labour force population	1.4 million	1.4 million
Part-time workers who wish to have full-time jobs	100 000	125 000
Part-time workers who do not wish to have full-time jobs	300 000	375 000
Discouraged workers	400 000	500 000
Workers with full-time jobs	1.2 million	1.3 million
Unemployed members of the labour force	150 000	160 000

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INTERNET APPLICATION QUESTIONS

1. Access Statistics Canada's website (at **http://www.statcan.gc.ca**).
   a. Use the links to "Students and Teachers" and "Summary Tables" to find the annual changes in Canada's consumer price index for the last four years for which data are available. Which component of the CPI has risen most quickly over this [illegible] component has fallen the most (or risen the least)?

http://www.statcan.gc.ca

http://www.statcan.gc.ca/

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4. Employ the Bank of Canada's online Inflation Calculator (at **http://www.bankofcanada.ca/english/inflation_calc.html**) to calculate the overall changes in the CPI, and the average inflation rates between:
   a. 2000 and 2009
   b. 1990 and 1999
   c. 1980 and 1989

5. Access Statistics Canada's E-Stat site (at **http://www.statcan.gc.ca/estat/licence-eng.htm**).
   a. On the basis of the information in "Labour," generate a table showing the annual unemployment rates for men 15 years and over and women 15 years and over since 1976.
   b. Historically, the unemployment rate for women in Canada was higher than for men, but now the two rates are related in the opposite fashion. In which years did this switch take place? What arguments can you make to explain this switch?

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