BANK OF CANADA
BANQUE DU CANADA

Monetary Policy Report

October 2013

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Canada's Inflation-Control Strategy[1]

Inflation targeting and the economy

- The Bank's mandate is to conduct monetary policy to promote the economic and financial well-being of Canadians.
- Canada's experience with inflation targeting since 1991 has shown that the best way to foster confidence in the value of money and to contribute to sustained economic growth, employment gains and improved living standards is by keeping inflation low, stable and predictable.
- In 2011, the Government and the Bank of Canada renewed Canada's inflation-control target for a further five-year period, ending 31 December 2016. The target, as measured by the total consumer price index (CPI), remains at the 2 per cent midpoint of the control range of 1 to 3 per cent.

The monetary policy instrument

- The Bank carries out monetary policy through changes in the target overnight rate of interest.[2] These changes are transmitted to the economy through their influence on market interest rates, domestic asset prices and the exchange rate, which affect total demand for Canadian goods and services. The balance between this demand and the economy's production capacity is, over time, the primary determinant of inflation pressures in the economy.
- Monetary policy actions take time—usually from six to eight quarters—to work their way through the economy and have their full effect on inflation. For this reason, monetary policy must be forward looking.
- Consistent with its commitment to clear, transparent communications, the Bank regularly reports its perspective on the forces at work on the economy and their implications for inflation. The *Monetary Policy Report* is a key element of this approach. Policy decisions are typically announced on eight pre-set days during the year, and full updates of the Bank's outlook, including risks to the projection, are published four times per year in the *Monetary Policy Report*.

Inflation targeting is *symmetric* and *flexible*

- Canada's inflation-targeting approach is *symmetric*, which means that the Bank is equally concerned about inflation rising above or falling below the 2 per cent target.
- Canada's inflation-targeting framework is *flexible*. Typically, the Bank seeks to return inflation to target over a horizon of six to eight quarters. However, the most appropriate horizon for returning inflation to target will vary depending on the nature and persistence of the shocks buffeting the economy.

Monitoring inflation

- In the short run, a good deal of movement in the CPI is caused by fluctuations in the prices of certain volatile components (e.g., fruit and gasoline) and by changes in indirect taxes. For this reason, the Bank also monitors a set of "core" inflation measures, most importantly the CPIX, which strips out eight of the most volatile CPI components and the effect of indirect taxes on the remaining components. These "core" measures allow the Bank to "look through" temporary price movements and focus on the underlying trend of inflation. In this sense, core inflation is monitored as an *operational guide* to help the Bank achieve the total CPI inflation target. It is not a replacement for it.

1 See *Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Inflation-Control Target* (8 November 2011) and *Renewal of the Inflation-Control Target: Background Information—November 2011*, which are both available on the Bank's website.

2 When interest rates are at the zero lower bound, additional monetary easing to achieve the inflation target can be provided through three unconventional instruments: (i) a *conditional* statement on the future path of the policy rate; (ii) quantitative easing; and (iii) credit easing. These instruments and the principles guiding their use are described in the Annex to the April 2009 *Monetary Policy Report*.

The *Monetary Policy Report* is available on the Bank of Canada's website at **bankofcanada.ca**.

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ISSN 1201-8783 (Print)
ISSN 1490-1234 (Online)
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Monetary Policy Report

October 2013

This is a report of the Governing Council of the Bank of Canada:
Stephen S. Poloz, Tiff Macklem, John Murray, Timothy Lane, Agathe Côté and Lawrence Schembri.

"Many of the conditions needed to support a return to natural growth are already in place in Canada…. It may be slow in coming, but it will emerge."

—Stephen S. Poloz

Governor, Bank of Canada
Vancouver, British Columbia
18 September 2013

Contents

Global Economy

The global economy is expected to expand modestly in 2013, although its near-term dynamic has changed and the composition of growth is now slightly less favourable for Canada. The U.S. economy is softer than expected but, as fiscal headwinds dissipate and household deleveraging ends, growth should accelerate through 2014 and 2015. The nascent recovery in Europe, while modest, has surprised on the upside. China's economy is showing renewed momentum, while growth in a number of other emerging-market economies has slowed as their financial conditions have tightened. Overall, the global economy is projected to grow by 2.8 per cent in 2013 and accelerate to 3.4 per cent in 2014 and 3.6 per cent in 2015 (**Table 1**).

Table 1: Projection for global economic growth

	Share of real global GDP[a] (per cent)	Projected growth[b] (per cent)			
		2012	2013	2014	2015
United States	20	2.8 (2.2)	1.5 (1.7)	2.5 (3.1)	3.3 (3.2)
Euro area	14	-0.6 (-0.5)	-0.4 (-0.8)	1.0 (0.8)	1.3 (1.3)
Japan	5	2.0 (1.9)	1.8 (1.9)	1.5 (1.3)	1.0 (1.2)
China	15	7.7 (7.8)	7.7 (7.4)	7.4 (7.3)	7.2 (7.5)
Rest of the world	47	3.2 (3.1)	2.8 (2.9)	3.4 (3.6)	3.7 (3.8)
World	100	3.1 (3.0)	2.8 (2.8)	3.4 (3.5)	3.6 (3.7)

a. GDP shares are based on International Monetary Fund (IMF) estimates of the purchasing-power-parity (PPP) valuation of country GDPs for 2012. The individual shares may not add up to 100 owing to rounding.

Source: IMF, *World Economic Outlook*, October 2013

b. Figures in parentheses are projections used for the July 2013 *Monetary Policy Report*.

Source: Bank of Canada

Global financial conditions have been affected by the anticipation of U.S. tapering

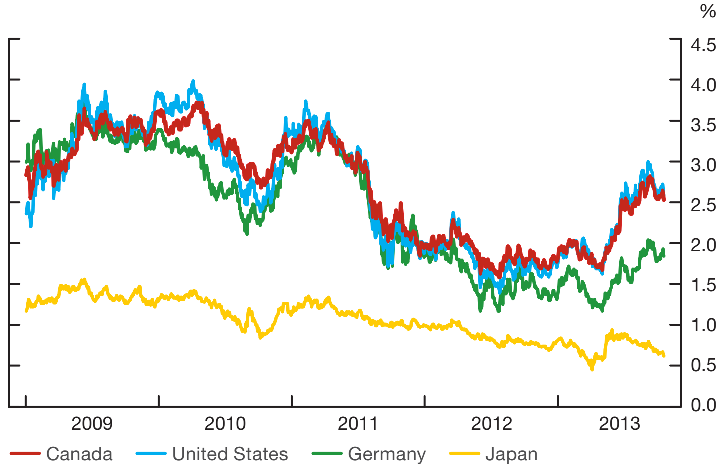
Global financial conditions tightened from May through September in response to an anticipated slowing in the pace of asset purchases by the U.S. Federal Reserve. The market reaction was stronger than expected. More recently, financial conditions have eased somewhat, following the decision in September by the Federal Reserve to maintain the pace of its asset purchases.[1]

In advanced economies, yields on government bonds have risen from the lows reached in May, especially at longer maturities. A notable exception is Japan, where bond yields have declined somewhat, owing to the Bank of Japan's commitment to double the monetary base by the end of 2014 by purchasing Japanese government bonds to achieve its 2 per cent inflation target.

1 Political disagreements in the United States over the government budget added some further uncertainty to financial markets through the month of October, but the price effects were generally small and largely concentrated in very short-term U.S. government instruments.

Chart 1: Yields on most major government bonds have risen recently, but are still low by historical standards

Yields to maturity on 10-year sovereign bonds, daily data

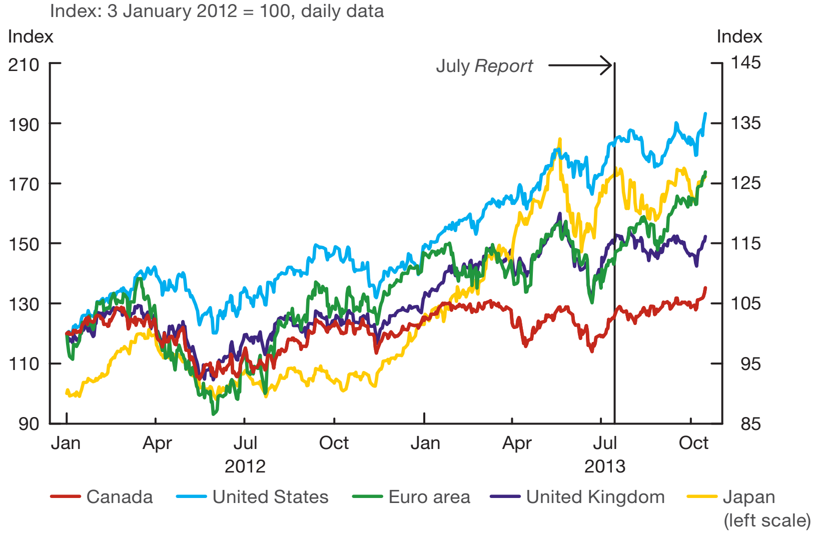


Source: Reuters

Last observation: 18 October 2013

Chart 2: Equity indexes in several advanced economies are at multi-year high levels

Index: 3 January 2012 = 100, daily data



Source: Bloomberg

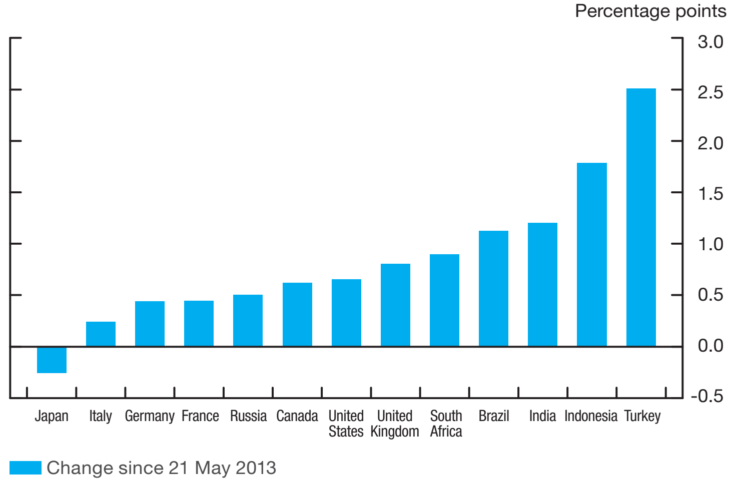
Last observation: 18 October 2013

Despite the recent tightening, global financial conditions remain highly supportive—yields on most major government bonds are low by historical standards, and equity indexes are at multi-year high levels in several advanced economies (**Chart 1** and **Chart 2**). Yield spreads on most euro-area peripheral sovereign bonds have narrowed, reflecting signs of recovery in euro-area macroeconomic conditions and progress on reforms. Although spreads on U.S. corporate bonds have widened modestly since May, issuance has remained solid.

The tightening of financial conditions in EMEs has been more pronounced than in advanced economies. The anticipation of U.S. tapering and a reassessment of the growth prospects for some EMEs have led to capital outflows, a marked rise in bond yields and a decline in equity prices (**Chart 3**). However, there has been significant market differentiation among EMEs: those with weaker economic fundamentals, such as large fiscal and current account deficits, high inflation and declining growth prospects, have been the most affected.

Chart 3: Bond yields in vulnerable emerging-market economies have risen more than in advanced economies

Percentage-point change in yields to maturity on 10-year sovereign bonds, daily data



Source: Bloomberg

Last observation: 18 October 2013

Recent softness in the U.S. economy is projected to give way to a solid recovery

U.S. real GDP grew by slightly less than 2 per cent during the first half of 2013. Growth is projected to have remained modest in the second half of the year and below expectations in July.

This near-term softness has been broad-based. Consumer spending has been dampened by the increase in payroll taxes in January 2013 and a moderation in employment growth (**Chart 4**). Housing activity has also slowed, largely in response to the 95-basis-point rise in mortgage interest rates. In contrast, business investment has increased, but by less than expected, despite strong corporate balance sheets. Government spending continues to contract as the sequestration cuts are implemented.

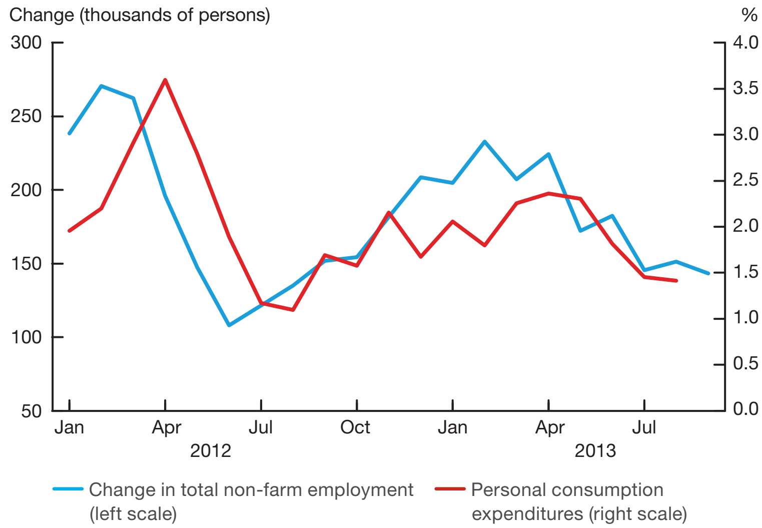
The failure to reach a timely agreement to fund government operations resulted in a partial government shutdown in the first half of October. The shutdown will dampen economic growth in the fourth quarter, through the direct effect of furloughed government workers, and, more broadly, through negative effects on confidence. In addition, the debt-ceiling debate has exacerbated the adverse impact on confidence and economic activity.

The projection for U.S. real GDP growth in the second half of 2013 is significantly lower than in the July *Report*, mainly reflecting softer-than-expected domestic demand. The drag from previous tax increases and spending cuts is expected to amount to 1.8 percentage points in 2013, and then to decline to 0.8 percentage points in 2014 and zero in 2015. Monetary policy remains highly stimulative, with members of the Federal Open Market Committee expecting the first increase in the federal funds rate to occur only in 2015.

The expansion of U.S. private sector demand in 2014 and 2015 should be broad-based. Consumption is projected to increase at a more solid pace, supported by substantially healthier household balance sheets (**Chart 5**) and improving labour market conditions. Residential investment should also increase vigorously, given the strong underlying fundamentals: the still-low level of mortgage interest rates, an expected rebound in household formation,

Chart 4: U.S. consumer spending has been dampened by fiscal consolidation and a moderation in employment growth

3-month moving average, monthly data



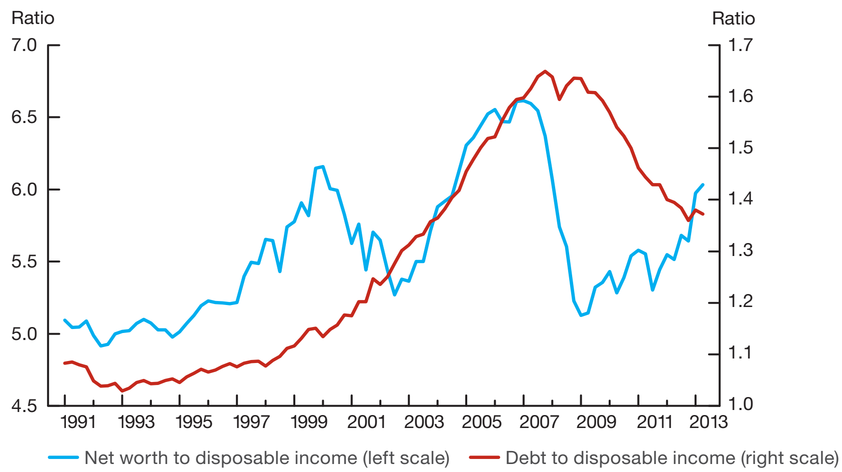
Note: Personal consumption is shown as a percentage change at annual rates.

Sources: U.S. Bureau of Economic Analysis and U.S. Census Bureau

Last observations: September 2013 for employment, August 2013 for personal consumption

Chart 5: U.S. households have substantially repaired their balance sheets

Quarterly data



Note: Calculations of U.S. household debt include the unincorporated business sector.

Sources: U.S. Federal Reserve and U.S. Bureau of Economic Analysis

Last observation: 2013Q2

significant pent-up demand, and the decline in both actual and shadow inventories of homes. Business investment will benefit from the improvement in demand, as well as from the solid financial positions of firms.

Exports are also projected to be an important driver of U.S. economic growth through 2015, supported by strengthening foreign demand and improved competitiveness brought about by sustained gains in productivity and lower energy costs. While overseas oil imports should continue to fall, reflecting the expansion in domestic supply, non-oil imports are expected to increase steadily, driven by stronger domestic demand.

Box 1

Determining Uncertainty Around the Bank's Projection for Key Variables

For policy purposes, it is important to acknowledge that economic projections are subject to considerable uncertainty and are revised over time as new economic data become available. To convey a sense of uncertainty, this *Monetary Policy Report* provides "rule of thumb" ranges around the base-case projection for the growth of U.S. and Canadian GDP and Canadian total CPI inflation, as well as for the current level of the output gap and the growth rate of potential output in Canada.

The approaches used to construct the range around each projection differ. For example, the intervals for projected GDP growth and inflation are informed by the average cross-sectional dispersion of private sector forecasters surveyed by Consensus Economics.[1] A reasonable rule of thumb interval for both Canadian and U.S. growth in 2014, consistent with this approach, is ±0.5 percentage points.[2]

Using the same method for total CPI inflation suggests a range of around ±0.3 percentage points. Since this rule of thumb range is an ex ante measure of uncertainty, it is different from the ranges presented in **Chart 26** and **Chart 27**, which are based on statistical analysis of realized (ex post) forecast errors.

Since potential GDP is not widely forecast, it is impossible to compute forecast dispersion. In this case, it is more informative to show a range based on sensitivity analyses around the various assumptions on which our projection is based. This suggests a range for Canadian potential output growth of approximately ±0.3 percentage points (see **Appendix A**).

Finally, the ±0.5-percentage-point range for the 2013Q3 output gap is based roughly on the range of estimates from the Bank's various output-gap indicators. For example, the conventional estimate of excess supply for the same quarter is 1.3 per cent, whereas a more structural cohort-based model suggests excess supply of 1.8 per cent. As a result, the Bank judges that a reasonable range is around 1 to 2 per cent.

1 The sample used to calculate the average dispersion is 2000–13, and in each case, the highest and lowest forecasts were dropped from the sample.

2 The precise average dispersion in GDP forecasts (for the following year) is ±0.4 percentage points for Canada and ±0.7 percentage points for the United States (the United States is higher largely because of a greater number of forecasters in the sample). Consensus Economics only provides the average forecast at a 2-year horizon, so dispersion cannot be calculated.

Overall, U.S. economic activity is expected to strengthen as fiscal headwinds dissipate and household deleveraging ends. The Bank projects that the U.S. economy will grow by 1.5 per cent in 2013, 2.5 per cent in 2014 and 3.3 per cent in 2015. Based on past dispersion of private sector forecasts, U.S. economic growth in 2014 would be expected to fall within ± 0.5 percentage points of the Bank's projection, with a somewhat wider range in 2015 (**Box 1**).

U.S. inflation has been on a declining trend since early 2012, owing to substantial slack in the economy and various temporary factors. As excess supply is gradually reduced over the projection period, inflation is expected to move back toward the Federal Reserve's 2 per cent inflation target.

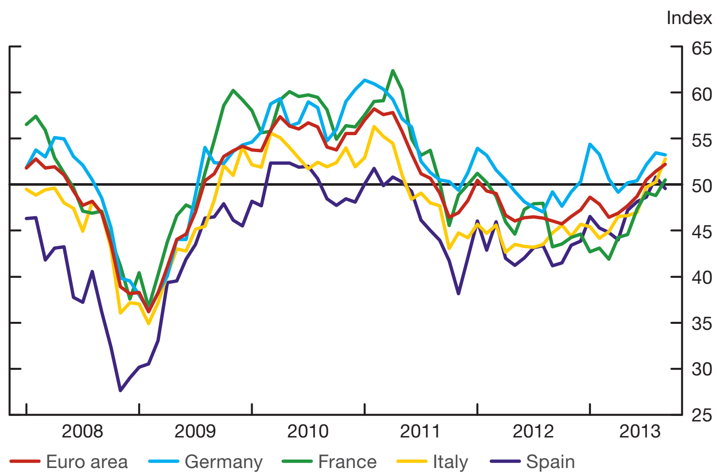
The nascent recovery in the euro area is expected to be modest

Economic growth has resumed in the euro area, ending a six-quarter recession. Real GDP rose by 1.1 per cent in the second quarter of 2013, a significantly stronger result than anticipated in the July *Report*. Since then, survey indicators have suggested continued growth (**Chart 6**). The economic recovery is projected to proceed slowly, however, reflecting the need to rebuild private sector balance sheets, ongoing fiscal consolidation, tight credit conditions and depressed labour markets.

While labour market competitiveness has improved in the euro-area peripheral economies, substantial cross-country differences in growth prospects are expected to persist. A sustained recovery will require further progress in structural, fiscal and banking reforms (including a timely completion of the banking union). As a result, uncertainty remains elevated, and the possibility of an extended period of very slow growth, as well as financial system vulnerability, still represents a downside risk to the Bank's outlook for the euro area. However, the likelihood of that risk materializing has decreased.

Chart 6: Purchasing managers' indexes suggest continued growth in real GDP in the euro area

Composite purchasing managers' index, monthly data



Note: The purchasing managers' index is a composite diffusion index. A reading above (below) 50 indicates that a larger percentage of firms reported that their production expanded (contracted) compared with the previous month, while a reading at 50 indicates that production was unchanged from the previous month.

Source: Markit Economics | Last observation: September 2013

Policy measures are expected to continue to support the ongoing recovery in Japan

Japan registered a strong upturn in economic activity in the first half of 2013. Real GDP growth averaged about 4 per cent over this period, supported by significant monetary and fiscal stimulus, a weaker yen, and improved confidence. Annual real GDP growth is expected to remain above the country's production potential over the projection horizon, reflecting the effects of Japan's ambitious program to revive economic growth and end deflation.[2] The pace of growth will nonetheless slow over 2014–15 as

2 The three-pronged program, commonly referred to as the "Three Arrows," consists of: (i) the adoption of a 2 per cent inflation target by the Bank of Japan and aggressive monetary easing to reach this goal within about two years; (ii) sizable fiscal stimulus in the near term followed by fiscal consolidation beginning in April 2014; and (iii) structural reforms, deregulation and trade promotion to boost the economy's growth potential.

legislated increases in the value-added tax take effect. Inflation expectations have risen materially since the end of 2012 and core inflation is no longer negative, suggesting that deflationary pressures have abated.

Economic growth in China has picked up…

Real GDP growth in China increased in the third quarter, supported by additional fiscal stimulus and a re-acceleration of investment in manufacturing.[3] However, the continued reliance on investment activity, the rapid growth of credit and increases in housing prices have reinforced concerns about financial stability and the sustainability of economic growth.

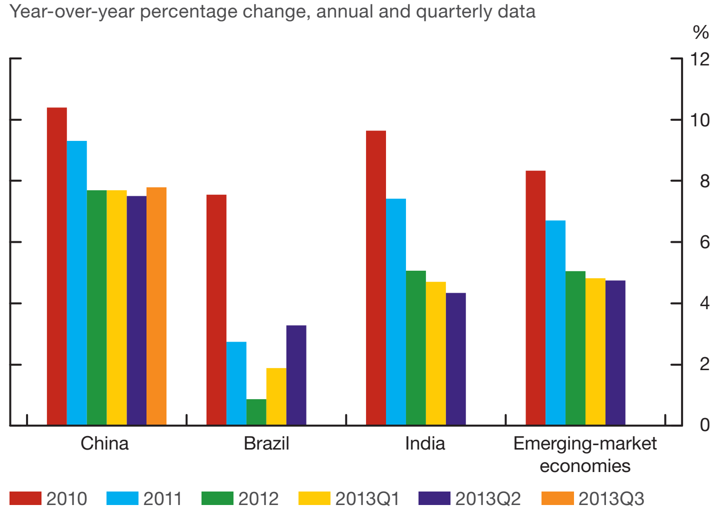
Real GDP growth through 2015 is projected to remain close to the government's 2013 target of 7.5 per cent. Robust growth in productivity and income, underpinned by some progress on reform measures, should support a gradual strengthening of private consumption and more sustainable investment activity. However, structural impediments such as the lack of social safety nets and overinvestment in the export sector will slow the rebalancing of the economy. Existing financial imbalances, together with the recent robust expansion in credit and excess capacity in a number of sectors, represent a downside risk to the Bank's projection.

…but growth prospects have moderated in some other emerging-market economies

Economic activity has slowed in some EMEs (**Chart 7**). To limit the depreciation of their currencies resulting from recent large capital outflows, authorities in some emerging-market countries have undertaken additional exchange rate interventions, introduced new capital controls and increased policy interest rates. In the near term, growth will continue to be held back by tighter financial conditions and heightened uncertainty, as well as by persistent supply constraints.

Chart 7: Economic activity has slowed in some emerging-market economies

Year-over-year percentage change, annual and quarterly data



Note: Countries are weighted by their GDP shares based on International Monetary Fund estimates of the purchasing-power-parity (PPP) valuation of country GDPs for 2012.

Sources: International Monetary Fund, Haver Analytics and Bank of Canada calculations

Last observations: 2013Q3 for China; 2013Q2 for all others

3 In July, the Chinese government announced new fiscal measures that will suspend taxes on small businesses, reduce fees and administrative burdens for exporters, and promote new funding sources for railway construction.

Economic growth in EMEs is expected to pick up modestly over 2014–15, driven by some stabilization in credit conditions, progress on the implementation of structural reforms to alleviate supply bottlenecks and strengthening demand from the advanced economies. Nevertheless, the recent financial market turbulence in EMEs, combined with existing domestic imbalances in a number of countries, represents a downside risk to the Bank's outlook.

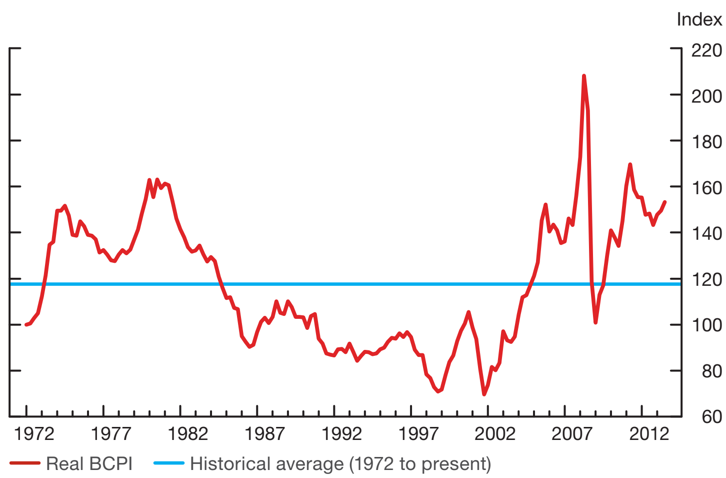
Despite recent declines, the Bank of Canada's commodity price index remains elevated

Commodity prices, as measured by the Bank of Canada's commodity price index (BCPI), have fallen by 6 per cent since July and are expected to remain relatively flat over the projection horizon, with a drop in crude oil prices offsetting a projected rise in the price of non-energy commodities. On balance, however, the BCPI remains elevated (**Chart 8**), underpinned by expectations of sustained demand from China and a continued recovery in the advanced economies.

As measured by the Brent benchmark, global crude oil prices are little changed from their levels in July, while West Texas Intermediate (WTI) prices have eased somewhat. Based on the latest futures curves, both Brent and WTI crude prices are assumed to decline by just under 15 per cent by the end of 2015, reflecting a continued robust increase in supply, especially from non-conventional sources, and a reduction in geopolitical concerns (**Chart 9**). Prices for Western Canada Select (WCS) have fallen by more than 20 per cent since the release of the July *Report*, owing to higher production levels, ongoing transportation constraints and lower demand due to refinery outages in North America. As a result, the spread between WTI and WCS prices has widened to approximately US$30 per barrel—the highest level since the beginning of 2013. Based on the latest futures curves, WCS prices are expected to hover around current levels over the projection horizon, with the gap between WTI and WCS prices expected to narrow to about US$20 per barrel.

Chart 8: The Bank of Canada's commodity price index remains elevated by historical standards

Bank of Canada commodity price index (BCPI) in real terms, 1972Q1 = 100, quarterly data

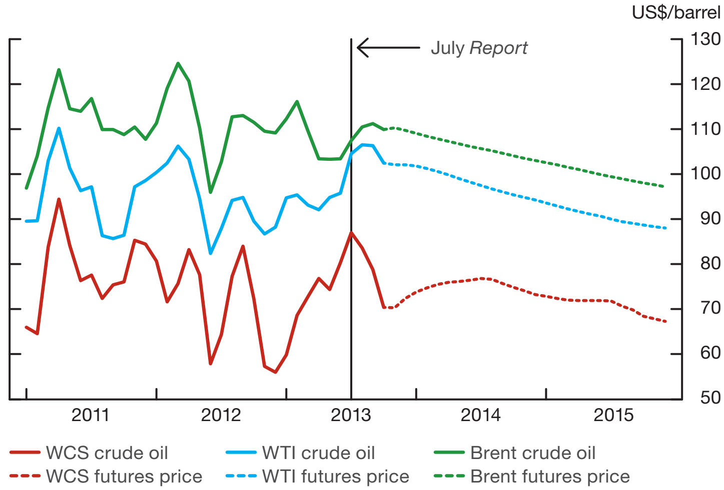


Source: Bank of Canada

Last observation: 2013Q3

Chart 9: Brent and WTI crude oil futures prices are declining to the end of 2015

Monthly data

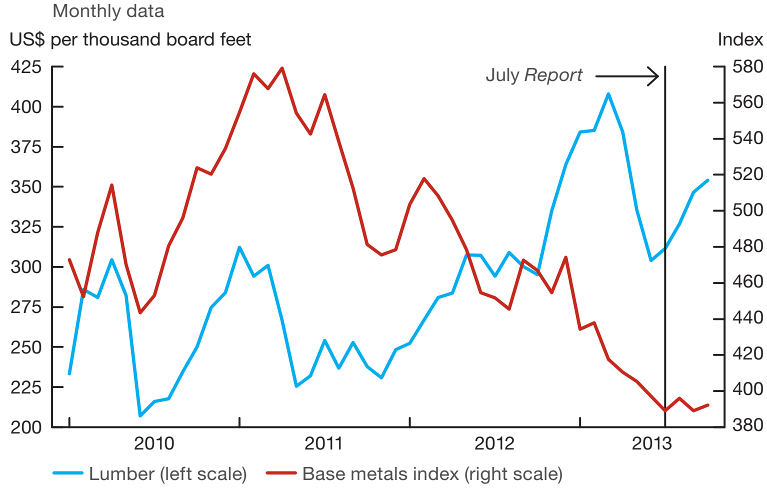


Notes: Values for October 2013 are estimates based on the average daily spot prices up to 18 October 2013. Futures prices are estimates based on an average of futures contracts over the two weeks ending 18 October 2013.

Source: Bank of Canada

Chart 10: Lumber prices have continued to recover, while prices for base metals have changed little since July

Monthly data



Notes: Values for October 2013 are estimates based on the average daily spot prices up to 18 October 2013. Base metals prices are indexed to January 1972 = 100.

Source: Bank of Canada

Last observation: 18 October 2013

Natural gas prices in North America have moved up modestly in recent months. The latest futures curves suggest that prices will increase further, rising slightly above US$4 per million BTU by the end of 2015, owing to growing demand for electricity generation.

In aggregate, non-energy commodity prices have stayed relatively flat since July. Following a sharp correction over the April–June period, lumber prices have continued to recover, while base metals prices are little changed (**Chart 10**). In contrast, agricultural prices have declined in anticipation of record harvests for key grains. Prices for non-energy commodities are expected to rise by roughly 15 per cent over the projection horizon, supported by a gradual strengthening in global economic activity.

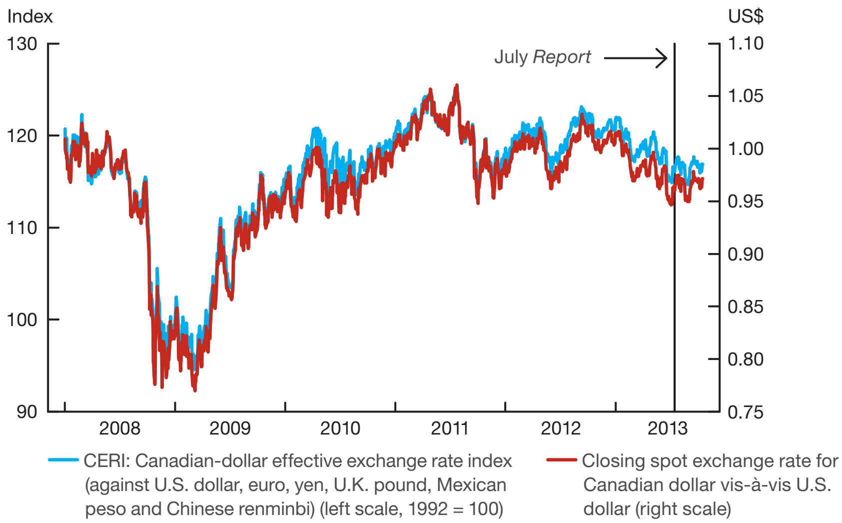
Summary

The projected acceleration in the growth of global demand should support a recovery of Canada's exports, although the composition has changed. Weaker growth in U.S. output in the near term, particularly in business and residential investment, will dampen Canadian exports relative to what had been expected in July. Elevated commodity prices should continue to sustain the high level of investment in the resource sector in Canada and support Canadian incomes.

The Canadian dollar has averaged roughly 97 cents U.S. since the September fixed announcement date, compared with the 96 cents U.S. assumed in the July *Report* (**Chart 11**). By convention, the Canadian dollar is assumed to remain at or near its current level over the projection horizon.

Chart 11: The Canadian dollar has remained relatively stable recently

Daily data



Note: A rise in either series indicates an appreciation of the Canadian dollar.

Source: Bank of Canada

Last observation: 18 October 2013

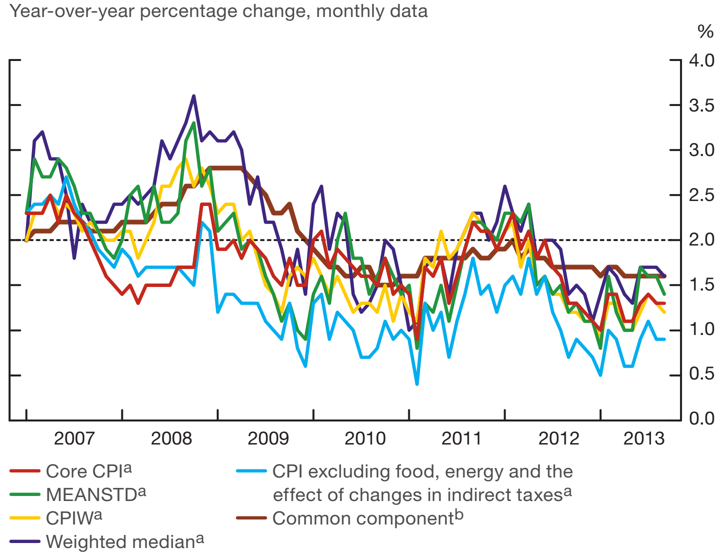
Canadian Economy

Inflation in Canada has remained low in recent months, reflecting the significant amount of slack in the economy, heightened competitiveness pressures in the retail sector and certain sector-specific factors (**Chart 12**). At the same time, uncertain global and domestic economic conditions are delaying the pickup in Canada's exports and investment. As a result, the current level of economic activity is now estimated to be lower than was anticipated in the July *Report*. While household spending remains solid, the continued slowing in the growth of household credit and the rise in mortgage interest rates point to a gradual unwinding of household imbalances.

While some recent developments have not been as supportive as anticipated, the Bank expects that a better balance between domestic and foreign demand will be achieved over time, resulting in stronger and more self-sustaining economic growth. GDP growth is expected to surpass that of potential output over the next two years as foreign activity and business confidence strengthen, and underlying momentum builds in the Canadian economy (**Chart 13** and **Table 2**). The output gap in the base-case

Chart 12: Alternative measures of core inflation remain well below 2 per cent

Year-over-year percentage change, monthly data



a. For definitions, see Rates & Statistics > Indicators > Indicators of Capacity and Inflation Pressures for Canada > Inflation.

b. Extracts the component of inflation that is common across the individual series that make up the CPI. See M. Khan, L. Morel and P. Sabourin, "The Common Component of CPI: An Alternative Measure of Underlying Inflation for Canada," Bank of Canada Working Paper No. 2013-35.

Sources: Statistics Canada and Bank of Canada calculations

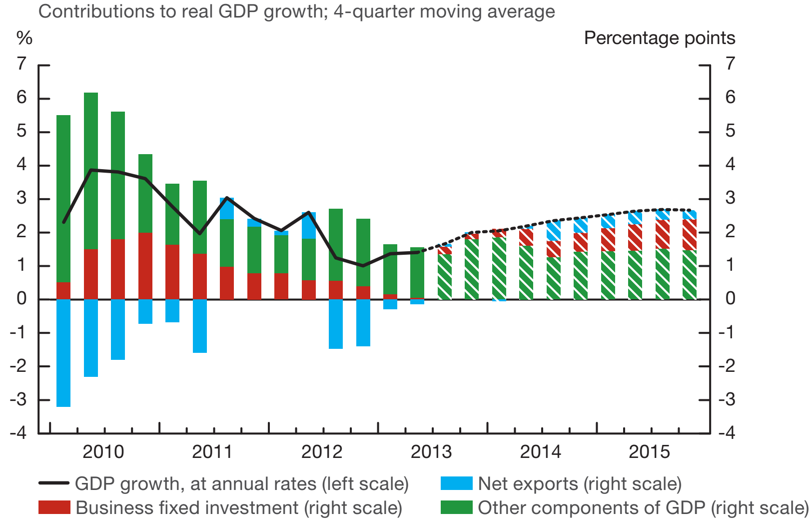
Last observation: September 2013

projection is anticipated to close around the end of 2015. In the context of well-anchored inflation expectations, this will contribute to a gradual return of both core and total CPI inflation to 2 per cent over the same horizon.

Overall, the Bank judges that the risks to the inflation outlook are roughly balanced over the projection horizon.

Chart 13: The composition of demand is expected to become more broadly based

Contributions to real GDP growth; 4-quarter moving average



Sources: Statistics Canada and Bank of Canada calculations and projections

Table 2: Contributions to average annual real GDP growth

Percentage points[a]

	2012	2013	2014	2015
Consumption	1.1 (1.1)	1.3 (1.0)	1.3 (1.4)	1.4 (1.5)
Housing	0.4 (0.4)	-0.1 (-0.1)	0.0 (-0.1)	0.0 (0.0)
Government	0.3 (0.3)	0.3 (0.3)	0.1 (0.0)	0.1 (0.1)
Business fixed investment	0.6 (0.6)	0.1 (0.2)	0.4 (0.6)	0.8 (0.9)
Subtotal: Final domestic demand	2.3 (2.3)	1.6 (1.4)	1.8 (1.9)	2.3 (2.5)
Exports	0.4 (0.4)	0.3 (0.8)	1.0 (1.4)	1.5 (1.3)
Imports	-1.0 (-1.0)	-0.4 (-0.2)	-0.7 (-0.8)	-1.2 (-1.1)
Subtotal: Net exports	-0.6 (-0.6)	-0.1 (0.6)	0.3 (0.6)	0.3 (0.2)
Inventories	0.0 (0.0)	0.1 (-0.2)	0.2 (0.2)	0.0 (0.0)
GDP	1.7 (1.7)	1.6 (1.8)	2.3 (2.7)	2.6 (2.7)
Memo items:				
Potential output	1.7 (2.0)	1.9 (2.1)	1.9 (2.2)	2.0 (2.1)
Real gross domestic income (GDI)	1.5 (1.5)	1.6 (1.8)	2.5 (2.8)	3.0 (3.0)

a. Figures in parentheses are from the projection in the July 2013 *Monetary Policy Report*. Those for potential output are from Box 2 in the October 2012 *Monetary Policy Report*.

The pickup in exports and business investment is delayed

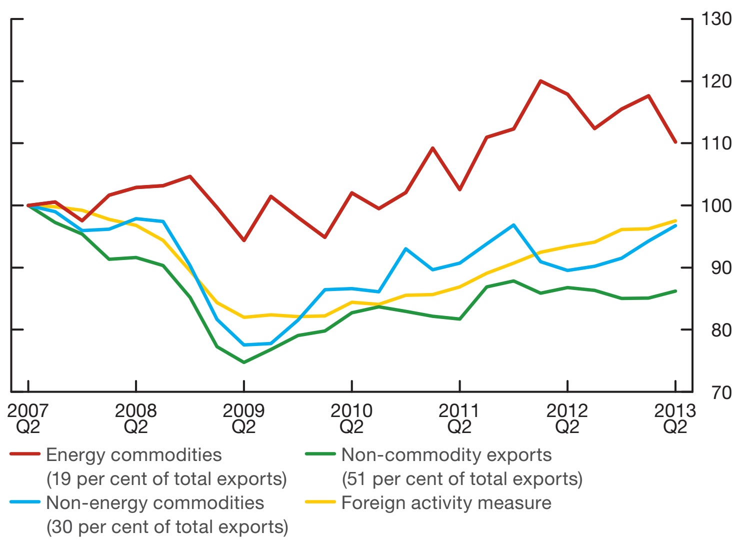
Real GDP is expected to have expanded at a slower pace in the third quarter than anticipated in the July *Report*.[4] This reflects weaker underlying momentum in exports and business fixed investment, as well as a smaller rebound from the temporary factors depressing growth in the second quarter. This composition of aggregate demand is less favourable for achieving sustainable growth.

Following a rebound in the first quarter, the performance of the export sector was lacklustre during the second and third quarters, with the exception of automotive and forestry products (**Chart 14**). Aside from temporary disruptions in the oil sector, the recent weakness in exports is indicative of a broader trend of slower-than-expected export growth that began in early 2012. As discussed in previous *Reports*, the weakness may be due to shifts in trade linkages that have been difficult to properly capture and to ongoing competitiveness challenges.

The projected expansion of U.S. business and residential investment in 2014 is still expected to fuel a rise in the growth rate of exports, albeit at a somewhat more moderate pace than expected in July. As economic activity improves, both in the United States and globally, exports of non-energy commodities such as metals and forestry products are projected to post strong gains. Following several disruptions in 2013, crude oil exports are also expected to contribute significantly to growth in 2014 as production continues to expand. Non-commodity exports such as machinery and equipment, consumer goods (excluding automobiles), and services are also expected to strengthen gradually, but at a slower pace than other export sectors.

Chart 14: Excluding energy, exports remain weak

Real exports and the foreign activity measure; index: 2007Q2 = 100 (pre-recession peak in total exports)



Sources: Statistics Canada and Bank of Canada calculations | Last observation: 2013Q2

4 Real GDP growth over the second and third quarters has not been as uneven as the Bank anticipated in July. The impact of flooding in southern Alberta and the construction strike in Quebec is now estimated to have depressed growth in the second quarter by about 0.5 percentage points (compared with the 1.3 percentage points projected in the July *Report*). The temporary nature of the shocks, together with the reconstruction and repair of damaged infrastructure in Alberta, is now estimated to have boosted real GDP growth by only about 0.9 percentage points in the third quarter (compared with the 1.8 percentage points anticipated in the July *Report*).

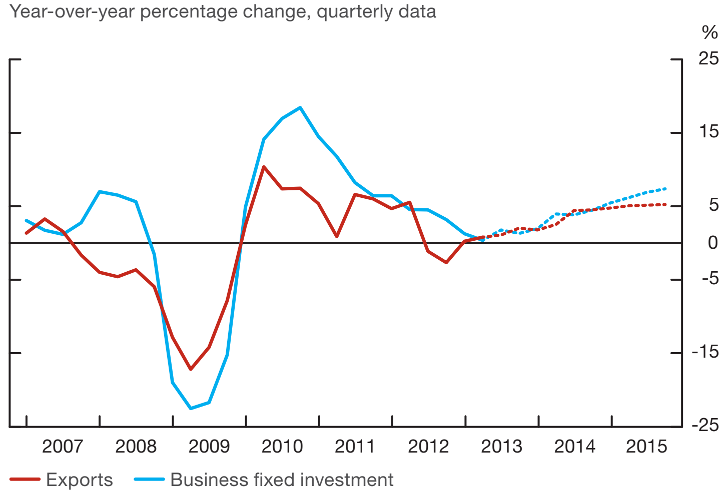
A key assumption underlying this projection is that the historical relationship between the growth rates of exports and foreign demand will gradually reassert itself once the recovery is more fully entrenched. There is a risk that this could take longer than anticipated. However, there are some encouraging signs that Canadian firms are taking steps to improve their export performance. Available evidence suggests that many Canadian firms have already begun, or are planning, to expand exports to the fastest-growing emerging markets.[5] Similarly, through the Bank's discussions with businesses for the *Business Outlook Survey*, a number of firms have reported that recent investments in innovation and marketing are supporting their ability to sell in existing or new export markets. They also consider that recent investments to improve efficiency or to lower costs are enhancing competitiveness. As the demand for Canadian exports rises and firms fully utilize their capital, this should spur productive investments and work to improve competitiveness further.

Against this backdrop, business investment is expected to strengthen, but with a more subdued profile than in the July *Report*, in line with the lower profile for exports. In particular, it is anticipated that business fixed investment will pick up over the next two years, consistent with historical relationships suggesting that business investment increases within about two to four quarters following a rise in exports (**Chart 15**). This view is supported by responses to the Bank's autumn *Business Outlook Survey*, which point to a growing number of firms reporting that they would face some difficulty meeting an unexpected increase in demand, since they are already using their existing labour and capital more intensively while awaiting signs that demand is strengthening. This is consistent with firms having some ability over the near term to accommodate strengthening demand but eventually needing to expand capacity.

With firms currently waiting to see a sustained increase in demand before committing to investment plans, investment intentions remain relatively subdued, even though indicators of business sentiment are close to their historical averages (**Chart 16**). However, there are some early signs that firms might be becoming more optimistic, since sentiment indicators have generally improved from the levels observed earlier in 2013, and have been

Chart 15: Growth in business fixed investment should pick up as exports strengthen

Year-over-year percentage change, quarterly data

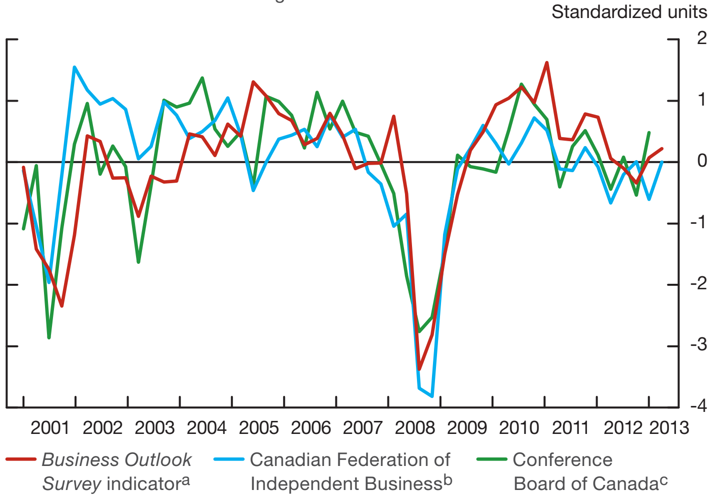


Sources: Statistics Canada and Bank of Canada calculations and projections

5 Export Development Canada, semi-annual survey of Canadian companies, released on 27 June 2013.

Chart 16: Indicators of business sentiment remain close to their historical averages

Deviations from historical average



a. This underlying measure is a summary of the responses to nine BOS questions. See L. Pichette and L. Rennison, "Extracting Information from the *Business Outlook Survey*: A Principal-Component Approach," *Bank of Canada Review* (Autumn 2011): 21–28.
b. Business barometer index, Canadian Federation of Independent Business
c. Index of business confidence, Conference Board of Canada

Sources: Conference Board of Canada, Canadian Federation of Independent Business and Bank of Canada (including calculations)   Last observations: 2013Q2 and 2013Q3

Chart 17: Financial conditions remain accommodative despite the recent rise in longer-term interest rates

Weekly data

Note: For more information on the effective business interest rate, see <http://credit.bankofcanada.ca/financialconditions>.

Sources: Reuters and Bank of Canada calculations   Last observation: 18 October 2013

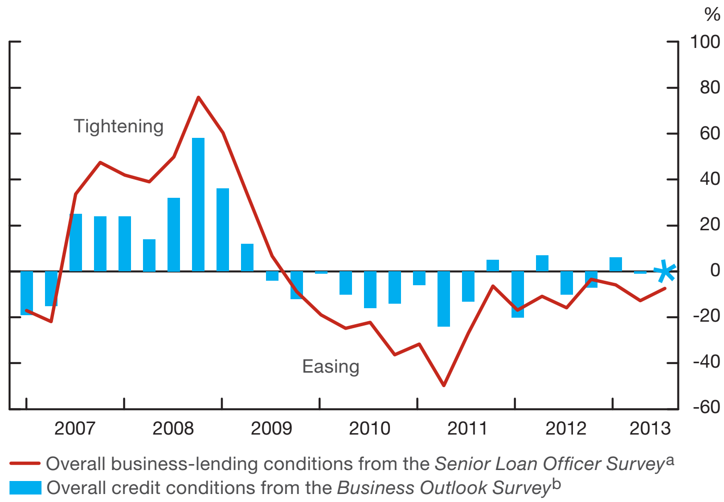
accompanied by a rise in firm creation.[6] The Bank's autumn *Business Outlook Survey*, together with other recently published private surveys, shows that firms expect a better performance over the next 12 months than over the past 12 months.[7]

6 There could be as many as 40,000 more firms with at least one employee than a year ago, following an extended period of stagnation since 2008. (See remarks by Stephen S. Poloz, "Returning to Natural Economic Growth," speech delivered to the Vancouver Board of Trade, 18 September 2013.)

7 Other surveys generally supporting this view include the C-Suite Survey, CFIB Business Barometer, CPA Canada Business Monitor and the BMO Small Business Confidence Report.

Chart 18: Credit conditions for Canadian firms remain favourable

Balance of opinion



a. Weighted percentage of surveyed financial institutions reporting tightened credit conditions minus the weighted percentage reporting eased credit conditions

b. Percentage of firms reporting tightened credit conditions minus the percentage reporting eased credit conditions

* Indicates a balance of opinion of zero

Source: Bank of Canada Last observation: 2013Q3

Solid underlying conditions are also building a supportive foundation for investment. Corporate balance sheets are healthy, with low aggregate leverage and abundant levels of working capital. Despite higher long-term interest rates, financial conditions in Canada remain accommodative, given the considerable monetary stimulus currently in place (**Chart 17**). This is underscored by responses to both the Bank's *Senior Loan Officer Survey* and the *Business Outlook Survey*, which indicate that business-lending conditions remain favourable (**Chart 18**). Indeed, there has been some firming in business credit growth in recent months, including strong bond issuance, partly because firms are locking in at relatively low rates.

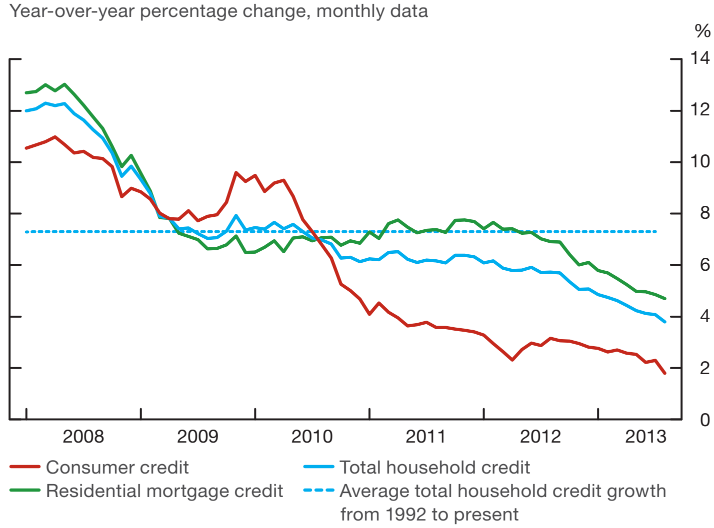
Household imbalances are expected to unwind gradually

Household expenditures (for both consumption and residential investment) have been stronger than was anticipated in July. Consumption has been underpinned by an improvement in consumer confidence, together with gains in employment and disposable income, and by the large financing incentives offered on purchases of automobiles. The recent vigour in residential investment may partly reflect activity that has been pulled forward in anticipation of higher interest rates on mortgages. However, the growth of household credit has continued to slow and is well below its historical average, consistent with a gradual unwinding of household imbalances (**Chart 19**). Market intelligence suggests that a number of contributing factors, including a reduction in purchases by first-time homebuyers and larger debt repayments, are also likely to be playing a role.

Despite slowing growth in household credit, consumption is still expected to increase at a moderate pace, in tandem with the expansion of disposable income (**Chart 20**). This profile is consistent with a high degree of consumer caution, which is reflected in a savings rate that is well above the average of the past decade.

Chart 19: The growth of household credit has continued to trend down

Year-over-year percentage change, monthly data

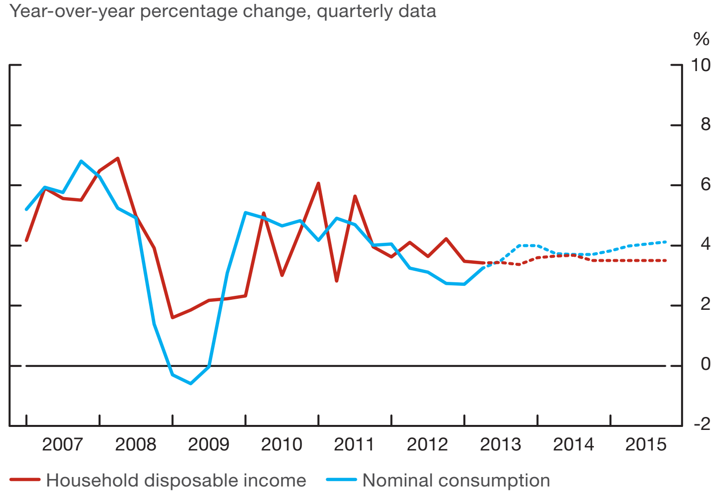


Source: Bank of Canada

Last observation: August 2013

Chart 20: Consumption is expected to grow at a moderate pace

Year-over-year percentage change, quarterly data

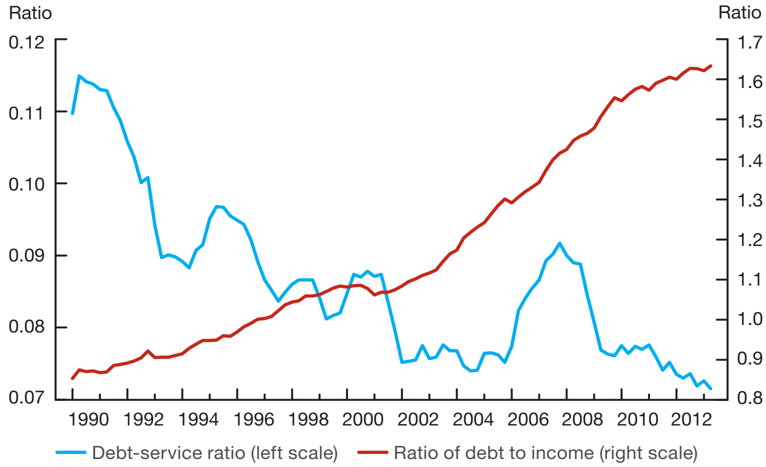


Sources: Statistics Canada and Bank of Canada calculations and projections

Credit conditions for households continue to be supportive of household expenditures, with effective borrowing rates at low levels. However, the increase in mortgage rates in recent months should exert a slight dampening effect on residential investment over coming quarters.[8] Residential investment is therefore projected to decline from the current historically high levels toward a more sustainable position. The household debt-to-income ratio, which edged up in the second quarter and is at a high level, should have a flat-to-lower profile over the projection horizon. In the base-case projection, debt-service ratios will rise gradually but will remain low (**Chart 21**).

8 For example, the rate for a typical 5-year mortgage has risen by roughly 85 basis points since June. The impact of the higher mortgage rates will be felt initially by first-time buyers and homeowners with variable-rate mortgages (about one-third of homeowners). Many of those renewing their mortgages now are still able to renegotiate their contracts at more favourable conditions than under their expiring contracts.

Chart 21: The household debt-to-income ratio is at high levels, but the debt-service ratio is very low



Source: Statistics Canada

Last observation: 2013Q2

While the Bank expects household caution to dampen spending over the forecast horizon, it is possible that, with still-favourable borrowing conditions, household expenditures could gather renewed momentum. The firmness in a range of housing market indicators in recent months reinforces this possibility. If the market strengthens further, it could increase the risk of a correction in house prices down the road.

Overall growth is expected to become more broadly based

Relative to the July *Report*, the outlook for economic growth in Canada is somewhat weaker over the projection horizon, owing to reduced contributions from net exports and business investment (**Table 2** and **Table 3**). The Bank forecasts an improvement in the underlying momentum of the economy through 2014 as external demand strengthens and business confidence rises. On an average annual basis, real GDP growth is projected to increase from 1.6 per cent in 2013 to 2.3 per cent in 2014 and 2.6 per cent in 2015. Given the degree of uncertainty inherent in projections, the Bank judges that GDP growth will likely be within ± 0.5 percentage points of the base-case projection in 2014, with a somewhat wider range in 2015 (see **Box 1** on page 5).

The pickup in the economy is projected to be driven by a rebound in the contribution of net exports. This dynamic is also expected to stimulate a more solid contribution from business fixed investment over time. The economy will continue to be supported by moderate growth in consumer spending, while residential investment will remain relatively flat, consistent with a convergence toward a more sustainable level of activity. Government spending is expected to contribute only very marginally to real GDP growth over the projection horizon, in line with the plans of federal, provincial and local governments to consolidate spending to achieve fiscal balance.

Table 3: Summary of the projection for Canada[a]

	2012	2013				2014				2015			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP (quarter-over-quarter percentage change at annual rates)	0.9 (0.9)	2.2 (2.5)	1.7 (1.0)	1.8 (3.8)	2.3 (2.5)	2.3 (2.7)	2.3 (2.8)	2.4 (2.8)	2.6 (2.8)	2.7 (2.8)	2.7 (2.5)	2.6 (2.4)	2.5 (2.2)
Real GDP (year-over-year percentage change)	1.0 (1.0)	1.4 (1.4)	1.4 (1.3)	1.7 (2.1)	2.0 (2.4)	2.0 (2.5)	2.2 (2.9)	2.4 (2.7)	2.4 (2.8)	2.5 (2.8)	2.6 (2.7)	2.7 (2.6)	2.7 (2.5)
Core inflation (year-over-year percentage change)	1.2 (1.2)	1.3 (1.3)	1.2 (1.1)	1.3 (1.3)	1.4 (1.6)	1.3 (1.5)	1.5 (1.7)	1.6 (1.8)	1.7 (1.9)	1.8 (1.9)	1.9 (2.0)	1.9 (2.0)	2.0 (2.0)
Total CPI (year-over-year percentage change)	1.0 (1.0)	0.9 (0.9)	0.7 (0.7)	1.1 (1.1)	1.3 (1.4)	1.2 (1.4)	1.4 (1.6)	1.6 (1.8)	1.7 (1.9)	1.8 (1.9)	1.9 (2.0)	1.9 (2.0)	2.0 (2.0)
Total CPI excluding the effect of the HST and changes in other indirect taxes (year-over-year percentage change)	0.8 (0.8)	0.9 (0.9)	0.8 (0.8)	1.2 (1.2)	1.4 (1.5)	1.3 (1.5)	1.4 (1.6)	1.6 (1.8)	1.7 (1.9)	1.8 (1.9)	1.9 (2.0)	1.9 (2.0)	2.0 (2.0)
WTI[b] (level)	88 (88)	94 (94)	94 (94)	106 (103)	102 (100)	101 (97)	99 (94)	97 (93)	95 (91)	93 (90)	91 (88)	90 (87)	88 (86)
Brent[b] (level)	110 (110)	113 (113)	103 (103)	110 (106)	110 (105)	108 (103)	107 (102)	105 (100)	104 (99)	102 (98)	100 (96)	99 (95)	98 (94)

a. Figures in parentheses are from the projection in the July 2013 *Monetary Policy Report*.

b. Assumptions for the price of West Texas Intermediate and Brent crude oil (US$ per barrel) are based on an average of futures contracts over the two weeks ending 18 October 2013.

Potential output growth is projected to remain fairly stable

Potential output grew at a noticeably slower pace during the recession (see **Appendix A**). Since 2010, the growth of Canada's production potential has begun a gradual recovery, as trend labour productivity picked up with the strong rebound in business investment.[9] Although much uncertainty surrounds estimates of potential output, the Bank projects that the profile for business investment will lead to further capital deepening (i.e., more capital will be available to workers) and will contribute to continued improvements in trend labour productivity over the next couple of years. In this regard, the expected rise in machinery and equipment investment, which has been relatively weak in recent years, should support the future performance of labour productivity. However, demographic factors, primarily the aging population, are expected to result in a slowdown in the growth rate of trend labour input and to largely offset these other effects.

On an average annual basis, potential GDP is expected to advance at a rate of around 2 per cent over the projection horizon, with a range of ± 0.3 percentage points. This is slightly weaker than assumed in the previous projection.

The sizable amount of excess supply should be absorbed gradually

Taking into account the various indicators of capacity pressures, the Bank judges that the amount of slack in the economy in the third quarter of 2013 was between 1 and 2 per cent. While this range for the output gap reflects the significant uncertainty surrounding any point estimate, the Bank is building the base-case economic projection using the midpoint of the range (i.e., 1.5 per cent). This is a somewhat greater degree of slack than expected in the July *Report,* mainly because the level of real GDP in the third quarter was lower than anticipated by 0.4 per cent.

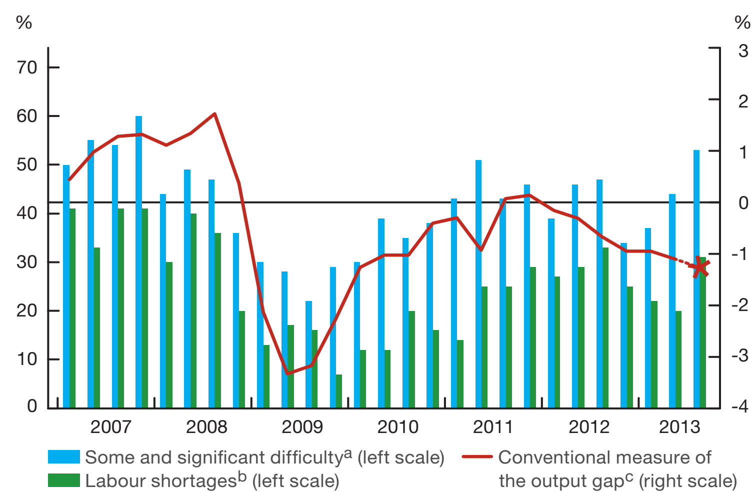
9 Trends described in this section remove cyclical variation from the raw data.

The Bank's conventional measure suggests that the output gap was close to the lower end of the 1 to 2 per cent range (**Chart 22**).[10] Moreover, recent data from the Bank's autumn *Business Outlook Survey*, which show that the indicators of labour shortages and capacity pressures have increased, are consistent with a gap near the lower end of this range. In the present environment of weak demand and ongoing uncertainty about future demand, firms are using existing capacity more intensively and waiting to make investments that would increase capacity. As they adjust their operations to current needs, more firms are reporting some challenges finding workers with specific skills or for specific positions.

An alternative structural approach (see **Appendix A**) suggests that the output gap is closer to 2 per cent in the third quarter. This reflects material slack in total hours worked, as well as a level of labour productivity that is considerably below its trend.[11] Other labour market indicators also point to a somewhat greater degree of slack than the conventional measure. For example, the proportion of involuntary part-time workers and the average duration of unemployment are still elevated (**Chart 23**), and wage increases remain subdued (**Chart 24**).

With the projected profile for growth in real GDP exceeding the assumed growth of potential output over the next two years, the Bank expects that the economy will gradually return to full production capacity around the end of 2015. On balance, the economy is projected to operate with a slightly larger amount of slack over the next two years than was anticipated in the July *Report*.

Chart 22: Significant excess capacity remains in the Canadian economy



a. Response to *Business Outlook Survey* question on capacity pressures. Percentage of firms indicating that they would have either some or significant difficulty meeting an unanticipated increase in demand/sales.

b. Response to *Business Outlook Survey* question on labour shortages. Percentage of firms reporting labour shortages that restrict their ability to meet demand.

c. Difference between actual output and estimated potential output from the Bank of Canada's conventional measure. The estimate for the third quarter of 2013 (indicated by *) is based on an increase in output of 1.8 per cent (at annual rates) for the quarter.

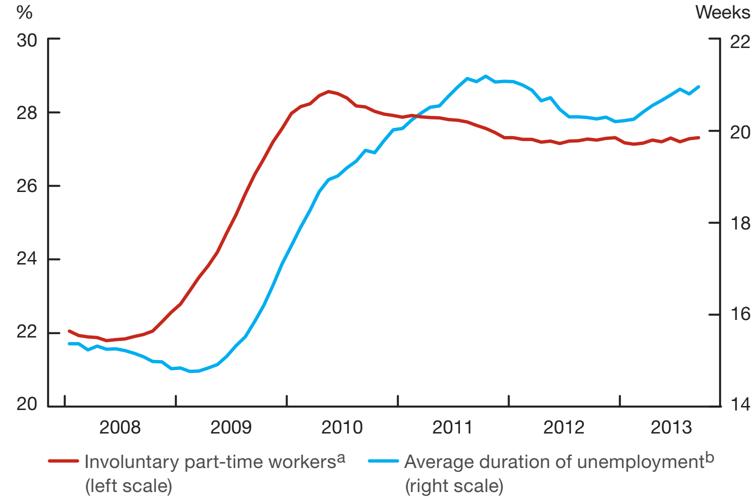
Source: Bank of Canada Last observation: 2013Q3

10 The conventional measure is based on the extended multivariate filter method (see L. Butler, "The Bank of Canada's New Quarterly Projection Model (QPM), Part 4. A Semi-Structural Method to Estimate Potential Output: Combining Economic Theory with a Time-Series Filter," Technical Report No. 77, Bank of Canada, 1996.

11 The level of average hours worked continues to be below its trend, driven primarily by youth underemployment.

Chart 23: Recent data on involuntary part-time work and the average duration of unemployment point to the persistence of excess supply

Monthly data

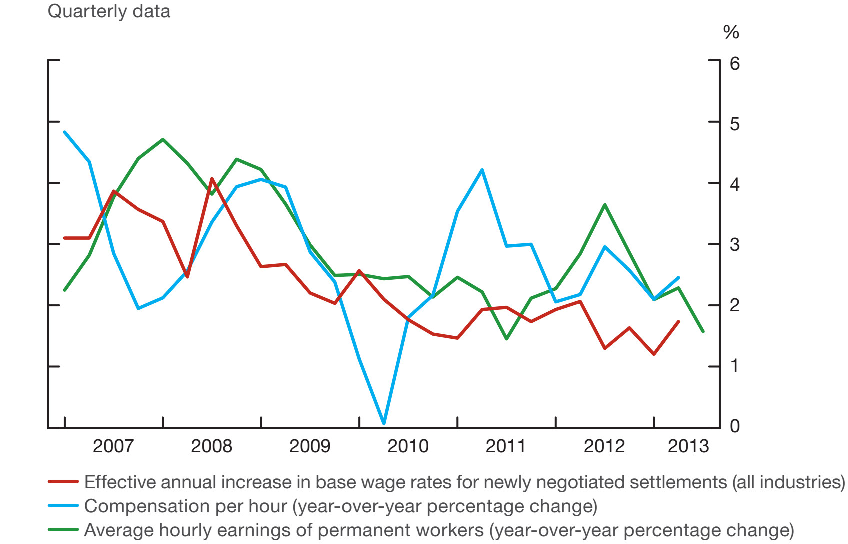


a. Expressed as a percentage of total part-time employment, unadjusted, 12-month moving average
b. Expressed as a 12-month moving average, in weeks

Sources: Statistics Canada and Bank of Canada calculations
Last observation: September 2013

Chart 24: Wage increases have been subdued recently

Quarterly data



Sources: Statistics Canada and Human Resources and Skills Development Canada
Last observations: 2013Q2 and 2013Q3

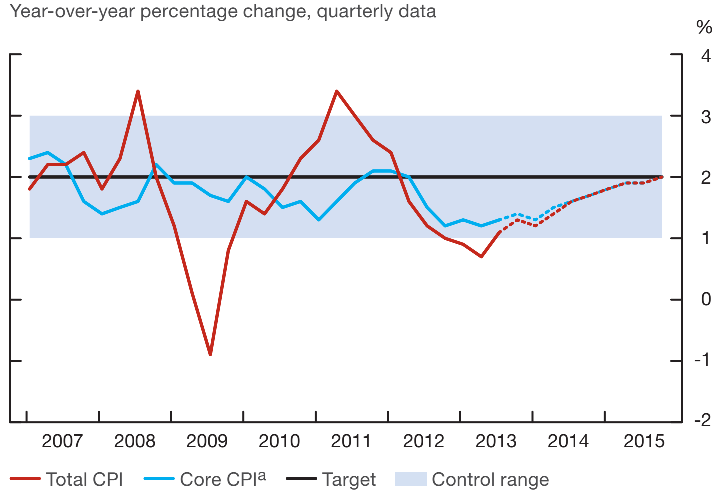
CPI inflation is expected to return slowly to target

Both core and total CPI inflation remain subdued (**Chart 25**). With a larger and more persistent amount of excess supply in the economy than projected in July, the return to target is now expected to take place somewhat later than previously anticipated.

Core inflation edged up from an average of 1.2 per cent in the second quarter to an average of 1.3 per cent in the third quarter. Low core inflation continues to reflect persistent material excess capacity in the economy, heightened competitiveness pressures and certain sector-specific factors.

Chart 25: Total CPI inflation is projected to return slowly to 2 per cent

Year-over-year percentage change, quarterly data



a. CPI excluding eight of the most volatile components and the effect of changes in indirect taxes on the remaining components

Sources: Statistics Canada and Bank of Canada calculations and projections

These factors include the impact of the unwinding of the sharp rise in global agricultural prices on core food prices, as well as lower auto insurance premiums in Ontario.

Various alternative measures of core inflation have all fallen to well below 2 per cent since the second half of 2012 (**Chart 12**).[12] Abstracting from idiosyncratic developments that affect some of these measures, the Bank assesses underlying inflation to be around 1.5 per cent.

The estimated impact of temporary factors on inflation is subject to some uncertainty. The Bank's base-case projection assumes that these temporary factors will gradually dissipate in coming quarters. Competitiveness pressures in the retail sector are expected to continue to dampen the level of prices, although their effects on the inflation rate are expected to dissipate in late 2014. With well-anchored inflation expectations, core inflation is projected to return slowly to 2 per cent around the end of 2015 as excess capacity is absorbed.[13]

Total CPI inflation also remains subdued, at just above 1 per cent on average in the third quarter, up from an average of 0.7 per cent in the second quarter. This reflects not only the rise in core inflation but also firmer prices for a number of volatile components, notably gasoline. The lower level of total CPI inflation relative to core largely reflects downward pressure from mortgage interest costs. Total CPI inflation is expected to return gradually to target around the end of 2015.

12 A new measure has recently been added to the Bank's set of alternative measures of core inflation. Labelled the "common component" of CPI, the new measure is designed to extract the component of inflation that is common across all the individual series that make up the CPI. In contrast to some other alternative measures, it is not affected by sector-specific price movements. It also appears to capture price movements that are indicative of fluctuations in aggregate demand in Canada. See M. Khan, L. Morel and P. Sabourin, "The Common Component of CPI: An Alternative Measure of Underlying Inflation for Canada," Bank of Canada Working Paper No. 2013-35.

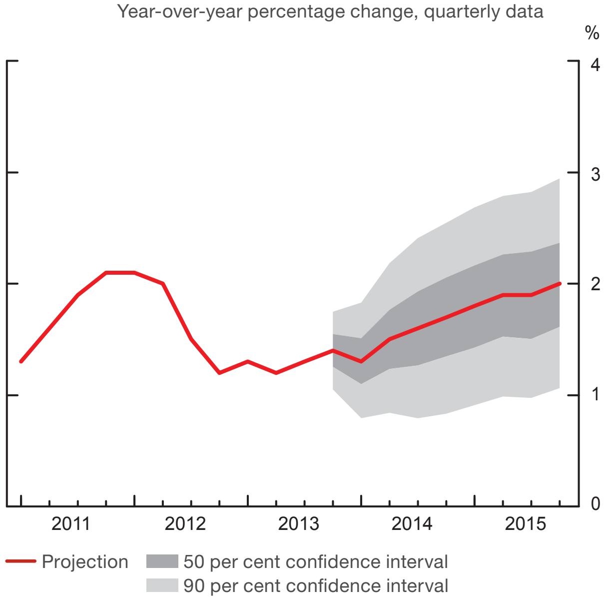
13 As previously assumed, the indirect effects associated with the restoration of the provincial sales tax in British Columbia are expected to have a minor effect on core inflation over the projection horizon (see the April 2012 *Monetary Policy Report*).

Indicators of inflation expectations remain consistent with the Bank's projection, which shows inflation remaining below the 2 per cent target until around the end of 2015. In this regard, the October Consensus Economics forecasts for total CPI inflation were 1.1 per cent in 2013 and 1.8 per cent in 2014. According to the latest *Business Outlook Survey*, inflation expectations are little changed. While almost all firms expect CPI inflation to be within the Bank's 1 to 3 per cent inflation-control range over the next two years, the majority expect it to remain in the bottom half of that range. A number of firms cited the current lack of inflationary pressures and subdued demand as factors driving their expectations. Market-based measures of longer-term inflation expectations continue to be consistent with the 2 per cent inflation-control target.

A reasonable range around the base-case projection for total inflation in 2014 is ± 0.3 percentage points (**Box 1**). This range is intended to measure ex ante forecast uncertainty. A complement to this range is shown in **Chart 26** and **Chart 27**. These fan charts are derived using statistical analysis of ex post errors from the Bank's projection models. They depict the 50 per cent and 90 per cent confidence bands for year-over-year core inflation and total CPI inflation from the fourth quarter of 2013 to the end of 2015.

Chart 26: Projection for core CPI inflation

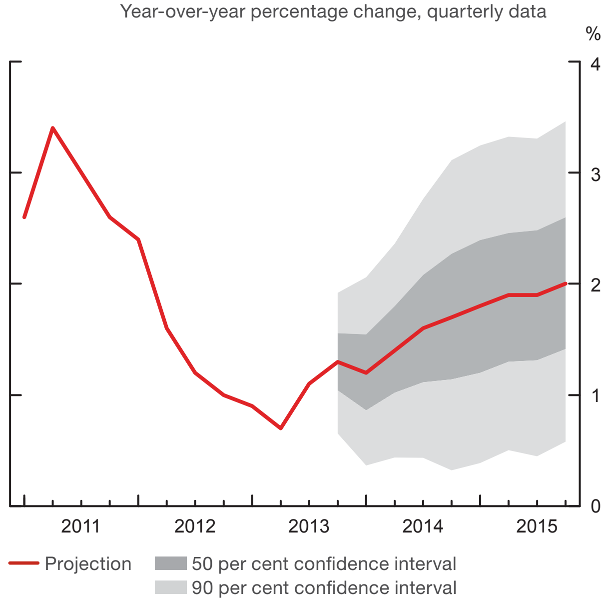
Year-over-year percentage change, quarterly data



Source: Bank of Canada

Chart 27: Projection for total CPI inflation

Year-over-year percentage change, quarterly data



Source: Bank of Canada

Risks to the Inflation Outlook

The fundamentals that drive the outlook for inflation are subject to several risks emanating from both the external environment and the domestic economy. The overall uncertainty surrounding the outlook is lower than it was a year ago, in part because the risks of some extreme events, such as a reintensification of the euro-area crisis, are significantly lower. The Bank judges that the risks to the projected inflation path are roughly balanced.

The most important external risks are:

(i) Stronger growth in advanced economies

More-robust economic growth than projected in the advanced economies is the major upside risk to inflation in Canada. Once the drag from fiscal policy dissipates, the United States is poised for faster growth, given the adjustments that have already occurred in the financial and household sectors. Growth in Europe and Japan has been faster than expected. The combined effect might produce a virtuous circle in which a more rapid recovery boosts confidence that will feed back into demand. Greater global demand would in turn translate into higher exports for Canada, rising commodity prices and an improvement in the terms of trade, which will support higher incomes and spending.

(ii) A more protracted and difficult euro-area recovery

Despite the recent improvement in economic conditions in the euro area and the reduced risk of a reintensification of the euro-area crisis, labour markets remain severely stressed, and progress on critical reforms has been slow. This could lead to a more protracted and difficult recovery, punctuated by renewed bouts of financial turbulence and uncertainty. Since Canada's direct trade links to the euro area are limited, the effects would be felt mainly through confidence and financial channels, as well as through indirect trade links.

The most important domestic risks are:

(i) Weaker exports

Canada's exports have been much weaker than anticipated and only a portion of that weakness can be explained by slower growth in foreign demand. While the base-case forecast assumes that the wedge between the level of exports and foreign demand will persist over the projection period, there is a possibility that exports could be even weaker than assumed. This risk could materialize if, for example, competitiveness challenges are greater than anticipated, resulting in an even larger loss of market share than assumed for exports. Reduced exports would likely translate into slower growth in business investment, since there would be less need to expand capacity. Together, weaker exports and business investment would pose a downside risk to inflation.

(ii) Domestic momentum builds faster than expected as confidence returns

Uncertainty about the strength of domestic and foreign demand is weighing heavily on firms' investment intentions. Once the recovery in foreign demand becomes more solidly entrenched, and with domestic demand continuing to grow at a moderate pace, business sentiment could improve rapidly. The sequence of stronger exports, rising confidence and increased investment could result in stronger overall growth and is an upside risk to the inflation outlook.

(iii) Disorderly unwinding of household sector imbalances

The elevated level of household debt and stretched valuations in some segments of the housing market remain an important downside risk to the Canadian economy. The continued slowing in household credit growth and the rise in mortgage interest rates point to a gradual unwinding of household imbalances. However, recent data suggest some risk of renewed momentum in the housing market. This would provide a temporary boost to economic activity, but could exacerbate existing imbalances and therefore increase the probability of a correction later on. Such a correction could have sizable spillover effects to other parts of the economy and to inflation.

Appendix A: Potential Output

This appendix provides details on how potential output is estimated and an analysis of its likely evolution through to 2016. Identifying the current level of potential output enables the Bank of Canada to estimate the output gap, and the projection of potential output growth sheds light on the prospects for economic growth in Canada.

Estimating Potential Output

Potential output is the level of output that can be sustained in an economy without adding to inflationary pressures. Estimating potential output is difficult because it is not directly observable. The Bank therefore relies on various models, indicators and judgment to arrive at an estimate that includes both historical and future growth. To help assess potential output, estimates based on demographic cohorts and production functions are used. Such estimates incorporate (among other things) information about demographics, wealth, investment and labour market developments. In the process, potential output can be decomposed into separate analyses of trend labour input (total hours worked) and trend labour productivity (real output per hour worked).

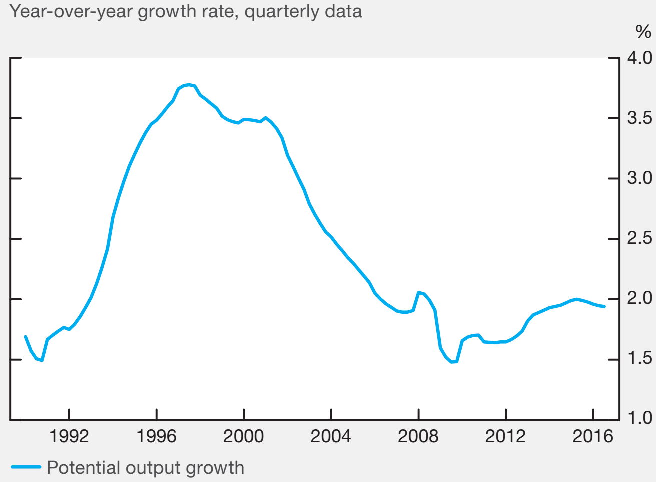
Potential Output Growth in Canada: A Historical Perspective

The growth rate of potential output can vary significantly over time. In Canada, potential output growth over the past 20 years can be divided into three distinct periods: the pickup in the mid-to-late 1990s; the slowdown in the 2000s; and the recession and beyond (**Chart A-1**).

The early 1990s were characterized by a significant strengthening in the growth rate of potential output. Beginning in about 1993, potential output began to increase with the start of the boom in technology production. Many new and innovative companies appeared on the Canadian business landscape, and often became industry leaders in the development and production of information and communication technologies (ICT). Both labour and capital flowed into this high-value-added industry, simultaneous with a productivity boom that continued until 2000. Throughout this period, the growth of trend labour input remained stable.

Chart A-1: The growth rate of potential output is expected to remain fairly stable around 2 per cent over the projection horizon

Year-over-year growth rate, quarterly data



Source: Bank of Canada calculations and projections

After 2000, productivity growth in Canada began a decline that would continue throughout the decade. The drop-off was characterized by weak investment in new technology, and a significant gap continued to exist between Canada and the United States in terms of ICT stock per worker.[1] With stable growth in trend labour input, this decline in labour productivity growth translated into a near one-for-one slowdown in potential output growth.

(continued…)

1 The reasons behind Canada's weak investment and poor productivity performance since 2000 are manifold. They range from the greater prevalence in Canada than in the United States of small businesses that are less likely to invest in new technologies to the role of the appreciation of the Canadian dollar in eroding the competitiveness of Canada's exporters, and lags associated with the economy's adjustment to commodity price shocks. It is also possible that U.S. firms took more advantage of offshoring and outsourced the least-productive stages of production, which contributed to the growing productivity gap between the two countries. Finally, there are measurement challenges for both output and prices (particularly in the resource and service sectors) that could be playing a role in the decline in the growth rate of Canadian labour productivity.

Appendix A (*continued*)

The recent recession led to a sudden drop in the growth rate of potential output. Some businesses shut their doors, capital was scrapped or left idle, and firms continued to use older vintages of capital as investment dried up, precipitating a drop in the trend labour productivity growth. Since the recession, there has been a small increase in trend labour productivity growth, reflecting a slow, but steady, recovery. Firms have yet to make major investments in new, productivity-enhancing machinery and equipment (M&E), but continue to undertake small upgrades that are improving productive capacity at the margin. Beginning around 2008, however, the effects of an aging population on labour supply also became more noticeable. As more baby boomers approach retirement age, there will likely be a persistent decline in the growth rate of trend labour input (hours worked), which will dampen potential output growth.

The Outlook: Where Is Potential Output Headed?

The growth rate of potential output is expected to remain fairly stable at around 2 per cent in the next three years (Table A-1), since the projected pickup in the growth rate of trend labour productivity will be offset by a further decline in the growth of trend labour input.

Table A-1: Assumptions for the growth of potential output

	2013	2014	2015	2016
Potential output growth	1.9 (2.1)	1.9 (2.2)	2.0 (2.1)	1.9
Trend labour input growth	0.8 (0.8)	0.7 (0.7)	0.6 (0.6)	0.5
Trend labour productivity growth	1.1 (1.3)	1.2 (1.5)	1.4 (1.5)	1.4

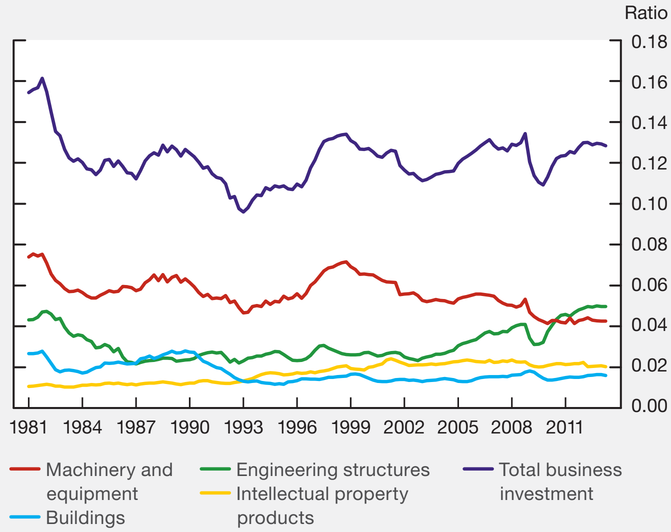
Note: Figures in parentheses correspond to October 2012 estimates.

The forecast for potential output growth has been revised down slightly owing to lower-than-expected labour productivity growth in the last half of 2012 and the first half of 2013, as well as the delay in the expected pickup in demand for exports and investment. Both of these factors have led to small downward revisions to the profile for trend labour productivity growth throughout the projection period and, hence, to the projection for potential output growth. Moreover, this revised forecast better balances the risks surrounding potential output growth.

The continued slowdown in the growth rate of trend labour input over the projection period reflects a combination of reduced employment rates associated with aging baby boomers and a slowdown in the growth rate of new labour force entrants, owing to relatively low fertility rates over the past 20 years. Uncertainty surrounds the projection for trend labour input, particularly that related to the future participation rate and average hours worked by older workers, which will depend importantly on their financial situation.

Chart A-2: Total business investment is high relative to GDP, mainly reflecting strong gains in engineering activity

Ratio of nominal business investment to nominal GDP, quarterly data



Sources: Statistics Canada and Bank of Canada calculations

Last observation: 2013Q2

Trend labour productivity growth is expected to rise throughout the projection period, reaching 1.4 per cent in 2015. Robust investment growth over the projection horizon will contribute to an acceleration in capital deepening, further building on the currently elevated ratio of investment relative to the capital stock and the current high share of investment in GDP (Chart A-2).

Since the recession, the relatively high level of investment spending has been supported primarily by investment in engineering in the mining, oil and gas sector (Chart A-2). Relative to historical standards, investment remains weak in productivity-improving M&E and in research and development (R&D). Investment in M&E contributes directly to productivity through capital deepening. Both investment in M&E and in R&D are also associated with the adoption of new technologies and processes that have a further positive effect on productivity.

As foreign activity and exports pick up over the projection horizon and Canadian firms increase their investment in M&E, a rebound in the rate of labour productivity growth is expected through both of these channels. Other factors that are expected to contribute to the recovery in the growth of trend labour productivity are Canada's highly educated workforce, which will enable the quick and efficient adoption

(*continued…*)

Appendix A (*continued*)

of new technologies, and the continued adjustment to the strong Canadian dollar as firms adapt to highly competitive international markets and make the necessary investments to become more productive.

A sensitivity analysis of the various assumptions on which the projection is based suggests a range of growth of ±0.3 percentage points around the base case. For instance, a plausible upper bound for potential output growth in 2014 is judged to be about 2.2 per cent, which assumes no slowdown in trend labour input growth from population aging relative to 2013 (0.8 per cent) and trend labour productivity of 1.4 per cent. This is a significant increase from 1.1 per cent in 2013 and a rate materially higher than the historical average of 1.1 per cent. On the downside, there could be a small outright decline in trend labour productivity growth (to 1 per cent) relative to 2013, while the slowdown in trend labour input growth could be more pronounced than anticipated, with a plausible lower bound judged to be about 0.6 per cent. Together, these growth rates imply a growth rate for potential in 2014 of 1.6 per cent.