OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

Economic and Fiscal Outlook Update: Follow-up Report to the House of Commons Standing Committee on Finance

Ottawa, Canada
November 20, 2013
www.pbo-dpb.gc.ca

The mandate of the Parliamentary Budget Officer (PBO) is to provide independent analysis to Parliament on the state of the nation's finances, the government's estimates and trends in the Canadian economy; and upon request from a committee or parliamentarian, to estimate the financial cost of any proposal for matters over which Parliament has jurisdiction.

This report provides follow-up information related to requests and issues raised by members of the House of Commons Standing Committee on Finance at Meeting No. 2 on October 29, 2013. PBO would be pleased to meet with members of the Standing Committee on Finance, or any parliamentarians, to further discuss PBO's analysis and provide additional information. The following report is based on data used in the October 2013 Economic and Fiscal Outlook Update.

Prepared by: Randall Bartlett*

* The author thanks Mostafa Askari, Patricia Brown, Scott Cameron, and Jocelyne Scrim for helpful comments. Any errors or omissions are the responsibility of the author. Please contact Mostafa Askari (e-mail: mostafa.askari@parl.gc.ca) for further information.

Analysis of Pipeline Constraints and Relative Oil Price Discounts

Request by Mr. Brian Jean (Fort McMurray—Athabasca)[1]:

> "We had the governor here previously. I didn't get a chance to ask him a question during committee, but I did immediately after. I asked him what the impact on productivity in Canada would be if pipeline capacity were able to meet the current demand. In other words, if we didn't have to discount our oil by $30 million to $50 million a day, what would be the impact on our economy?
>
> In particular, based on your analysis, what would be the impact on the economy if we added that?
>
> That's somewhere in the neighbourhood of $18 billion per year that is simply not going into the Canadian economy because of pipeline constraints. I know that you're well familiar with the file and I'd like you to comment on it: if that wasn't the case, if we did not have to discount our oil to the United States."

PBO does not construct its economic projection on a sector-by-sector basis nor examine the impact of the completion of proposed pipeline projects on the projection. Instead, PBO undertakes its independent economic projection through modeling aggregate economic variables. As such, PBO incorporates the impact of changes in crude oil prices into its economic projection through its projection of the Bank of Canada Commodity Price Index (BCPI).[2]

This being said, in order to respond to the question posed by the member, the following analysis briefly discusses the reasons that crude oil produced in Western Canada sells at a discount relative to other oil produced in North America and outlines the impact of changes in this discount on the Canadian economy.

Causes of Western Canadian Select price weakness

Quality discount

The benchmark used by PBO for the price of crude oil produced in Western Canada is Western Canadian Select (WCS). WCS "is made up of existing Canadian heavy conventional and bitumen crude oils blended with sweet synthetic and condensate diluents."[3] WCS is the benchmark commonly used by economists in Canada in analyzing the price differential relative to the traditional North American crude oil price benchmark, West Texas Intermediate (WTI).[4] In contrast to WCS, WTI is defined as a light sweet crude, which according to the CME Group[5], are "preferred by refiners because of their low sulfur content and relatively high yields of high-value products such as gasoline, diesel fuel, heating oil, and jet fuel."

Since the inception of WCS as a benchmark in December 2004, WCS has consistently been priced at a discount to WTI. On a quarterly basis, the discount paid for WCS relative to WTI was US$ 18.62 per barrel from 2005Q1 to 2013Q3, on average. According to Baytex Energy Corp., "WCS trades at a discount to WTI due to the higher cost of refining WCS crude into refined products, such as gasolines, jet fuel, kerosene, and diesel. This discount is referred to as a heavy oil differential."[6] More specifically, according to a 2011 study by the University of Calgary's School of Public Policy, the quality of WCS is about 25 per cent less than that of WTI, as measured by API gravity[7] and sulfur content, and is more expensive to refine as a

[1] http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=6273225&Language=E&Mode=1&Parl=41&Ses=2.

[2] See Annex A of the April 2013 Economic and Fiscal Outlook for more information.

[3] http://www.cenovus.com/operations/doing-business-with-us/marketing/western-canadian-select-fact-sheet.html.

[4] Brent is also a frequently used crude oil price benchmark, but differs from WCS and WTI in that it is based on a light sweet North Sea crude oil that serves as an international benchmark grade.

[5] CME refers to the Chicago Mercantile Exchange.

[6] http://www.baytex.ab.ca/operations/marketing/benchmark-heavy-oil-prices.cfm.

[7] API gravity is a scale expressing the gravity or density of liquid petroleum products. The higher the API gravity, the lighter the product.

consequence.[8] This quality discount is roughly equivalent to the historical price discount.

Other contributing factors

Beyond the quality discount, the low price paid for WCS has been exacerbated by strong North American supply growth leading to pipeline and refinery constraints and increased transportation costs, thereby reducing profitability.

The proliferation of enhanced recovery technologies continues to support a large increase in oil production in the U.S. and elsewhere while also increasing the viability of some existing conventional formations. According to the U.S. Energy Information Administration (EIA), U.S. domestic production has increased dramatically in recent years, having risen 15.1 per cent in 2012 for the fourth consecutive annual increase. Growth in U.S. import volumes of crude oil from Canada has also increased, rising by 5.3 per cent annually, on average, over the period 2003 to 2012. This largely appears to be the result of Canada displacing other sources of U.S. crude oil imports, as total U.S. crude oil import volumes fell over this same period.

As a consequence of this strong North American supply growth, pipeline and refinery constraints have emerged, putting downward pressure on prices. However, these pressures have recently diminished, as "the opening of the Seaway Pipeline and increased use of rail transportation for bitumen has alleviated the supply glut at Cushing, thereby boosting the price of WTI and WCS."[9] Further, "betting on declining supplies of light oil, refineries in the U.S. committed considerable investment dollars on upgrading capacity… The result is that supplies of light oil and demand for heavy oil have risen, leading to a narrower spread between light and heavy oil." This latter development has helped to reduce some of the price pressure on WCS relative to WTI. However, the Conference Board of Canada also notes that "the tight oil boom in the U.S. and rising oil sands production are both expected to put renewed capacity pressure on the Cushing hub. As a result, North American oil prices are expected to weaken again…"

Looking forward, both U.S. and Canadian production are expected to increase at a faster rate than U.S. and global demand, which can be expected to put further downward pressure on the price of both WTI and WCS. According to the EIA, U.S. crude oil production volumes are expected to increase by 2.8 per cent annually, on average, from 2013 to 2018, while Canadian petroleum production is expected to increase by 3.4 per cent annually, on average.[10,11] However, the EIA expects U.S. crude oil import volumes to decline by 3.3 per cent as total U.S. consumption of liquid fuels and other petroleum products increase by a modest 0.6 per cent annually, on average, over the same period. At the same time, the EIA expects global consumption (less U.S. consumption) to increase by an annual average of 2.3 per cent.

Economic impacts of different oil price projections

While the discount paid for WCS relative to WTI averaged US$ 18.62 per barrel from 2005Q1 to 2013Q3, the discount reached its quarterly historical high in 2013Q1 at US$ 31.96. According to futures contracts at the time the October 2013 Economic and Fiscal Outlook Update (EFOU) was being prepared, the discount is again expected to widen to US$ 29.24 in 2013Q4 before gradually converging to US$ 20.15 by the end of 2015. As this was the last futures contract available for WCS, this difference is held constant thereafter (Table 1).[12]

[8] http://policyschool.ucalgary.ca/sites/default/files/research/mmoore-oilmarket.pdf.

[9] Conference Board of Canada, "Canada's Oil Extraction Industry," Canadian Industrial Outlook, Summer 2013.

[10] http://www.eia.gov/forecasts/aeo/index.cfm.

[11] http://www.eia.gov/forecasts/ieo/pdf/0484(2013).pdf.

[12] Similar to the Bank of Canada, PBO uses the daily average of futures prices for the two weeks prior to the closing of the economic data set, which in the case of the October 2013 EFOU was October 4, 2013.

In analyzing the impact of changes in the WCS price discount to WTI, PBO has assumed that WCS is not discounted relative to WTI from 2013Q4 to 2018Q4 and used the method for projecting BCPI outlined in Annex A of the April 2013 Economic and Fiscal Outlook (Table 1). A higher price for WCS would increase the terms of trade and investment in oil sands development and refinery upgrading, thereby increasing both real gross domestic product (GDP) and real gross domestic income (GDI) in Canada. The level of employment in Canada would increase at the same time. However, it should be noted that eliminating the discount paid for WCS relative to WTI is not realistic, as there is a significant difference in the quality of these crude oil benchmarks that is reflected in the price difference. This scenario should therefore be thought of as illustrative only.

Table 1

Western Canadian Select Prices

US dollars per barrel

	2013	2014	2015	2016	2017	2018
No discount	82.17	96.73	89.36	85.24	83.18	82.08
Futures prices	74.86	74.19	69.69	65.09	63.03	61.93

Sources: Office of the Parliamentary Budget Officer; CME Group.

As a result of eliminating the discount paid for WCS relative to WTI, nominal GDP would be $8 billion higher over the projection, on average, as both real GDP and GDP inflation would be higher relative to the October 2013 EFOU (Table 2). In addition, the level of employment would be approximately 20,000 higher in 2018 in the no WCS price discount scenario than projected in the October 2013 EFOU (Table 3).

Table 2

Nominal GDP Projections

billions of dollars

	2013	2014	2015	2016	2017	2018
No WCS discount projection	1,873	1,940	2,026	2,121	2,205	2,282
October 2013 EFOU	1,873	1,937	2,017	2,110	2,193	2,270
Difference	*0*	*3*	*8*	*11*	*12*	*12*

Source: Office of the Parliamentary Budget Officer.

Table 3

Employment Level Projections

thousands

	2013	2014	2015	2016	2017	2018
No WCS discount projection	17,707	17,763	17,911	18,104	18,247	18,328
October 2013 EFOU	17,707	17,762	17,905	18,091	18,228	18,308
Difference	*0*	*1*	*6*	*14*	*19*	*20*

Source: Office of the Parliamentary Budget Officer.