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SECURITIES LITIGATION & CONSULTING GROUP

Structured Products Research Report

Report Prepared On: 01/20/14

Trigger Phoenix Autocallable Optimization Securities linked to Phillips 66

Structured Product Details

Name	Trigger Phoenix Autocallable Optimization Securities linked to Phillips 66
Issue Size	$7.72 million
Issue Price	$10
Term	18 Months
Annualized Coupon	10.89%
Pricing Date	November 8, 2013
Issue Date	November 13, 2013
Valuation Date	May 8, 2015
Maturity Date	May 14, 2015
Issuer	Royal Bank of Canada
CDS Rate	101.02 bps
Swap Rate	0.51%
Reference Asset	Phillips 66's stock
Initial Level	$65.36
Dividend Rate	1.80%
Implied Volatility	29.91%
Fair Price at Issue	$9.70
CUSIP	78009Q877
SEC Link	www.sec.gov/Archives/edgar/data/1000275/000121465913006344/a1112130424b2.htm

Description

Royal Bank of Canada issued $7.72 million of Trigger Phoenix Autocallable Optimization Securities linked to Phillips 66 on November 13, 2013 at $10 per note.

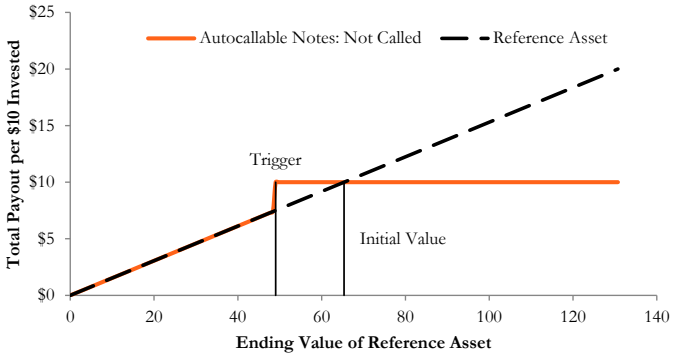
These 18-month notes are UBS-branded reverse convertible notes. On the quarterly coupon observation date, if the notes are not called back, they pay either quarterly coupon at an annualized rate of 10.89% if Phillips 66's stock price closes above the coupon barrier $49.02, or no coupon if the stock price closes below the barrier. The first coupon observation date is February 12, 2014. This autocallable notes will be called back if the reference stock price on any quarterly call observation date after February 12, 2014 exceeds the initial stock price $65.36. In this case, investors receive the principal plus any unpaid coupons. At maturity, the notes convert into shares of the reference security—0.15 share of Phillips 66's stock in this case—if the market value of the reference stock at the note's maturity is below the trigger price $49.02 (75% of the reference asset on November 8, 2013). Otherwise, investors will receive the $10 face value.

Valuation

This note can be viewed as a combination of a zero-coupon note from Royal Bank of Canada, a series of contingent coupon payments, and a short put option on the reference asset. For reasonable valuation inputs this note was worth $9.70 per $10 face value when it was issued on November 13, 2013, including $9.89 for the present value of the zero-coupon note, ($0.76) for the short put options, and $0.57 for the present value of all future contingent coupon payments.

There is no active secondary market for most structured products. Structured products, including this note, therefore are much less liquid than simple stocks, bonds, notes and mutual funds. Investors are likely to receive less than the structured product's estimated market value if they try to sell the structured product prior to maturity. Our valuations do not incorporate this relative lack of liquidity and therefore should be considered an upper bound on the value of the structured product.

Payoff Curve at Maturity



The payoff diagram shows the final payoff of this note given Phillips 66's stock price (horizontal axis). For comparison, the dashed line shows the payoff if you invested in Phillips 66's stock directly.

Related Research

Research Papers:

www.slcg.com/research.php

- *"Are Structured Products Suitable for Retail Investors?"* December 2006.
- *"Structured Products in the Aftermath of Lehman Brothers,"* November 2009.
- *"What TiVo and JP Morgan Teach Us about Reverse Convertibles,"* June 2010.

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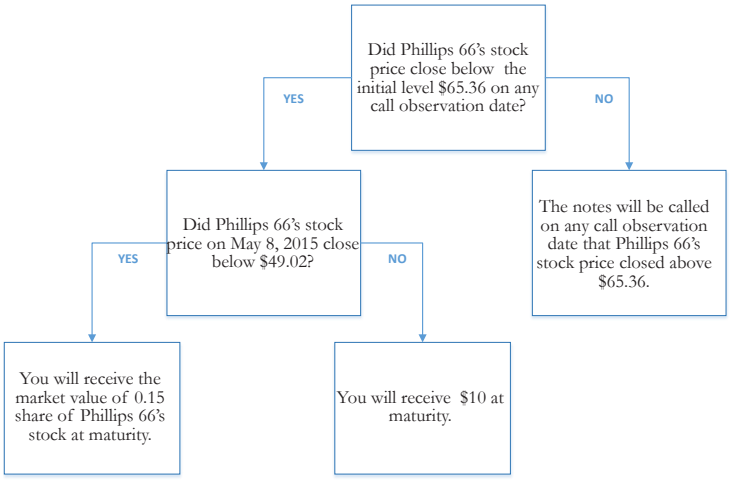
Principal Payback Table

Phillips 66's Stock	Note Payoff
$0.00	$0.00
$6.54	$1.00
$13.07	$2.00
$19.61	$3.00
$26.14	$4.00
$32.68	$5.00
$39.22	$6.00
$45.75	$7.00
$52.29	$10.00
$58.82	$10.00
$65.36	**$10.00**
$71.90	$10.00
$78.43	$10.00
$84.97	$10.00
$91.50	$10.00
$98.04	$10.00

Maturity Payoff Diagram



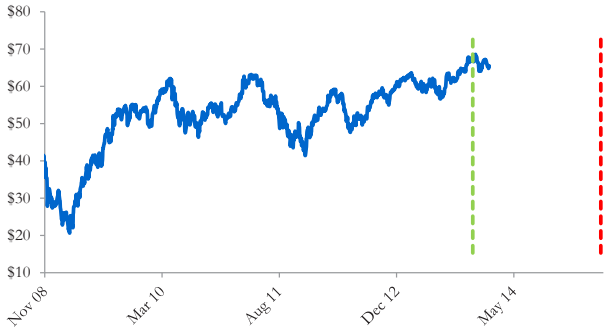
The contingent payoffs of this Trigger Phoenix Autocallable Optimization Security.

Analysis

The 10.89% coupon rate on this Trigger Phoenix Autocallable Optimization Security is higher than those paid by Royal Bank of Canada on its straight debts but, in addition to Royal Bank of Canada's credit risk, investors bear the risk that, 1) the note may be called; 2) the note may pay zero coupon because of the coupon contingency; 3) and the note will be converted into shares of Phillips 66's stock when Phillips 66's stock is worth substantially less than the face value of the note.

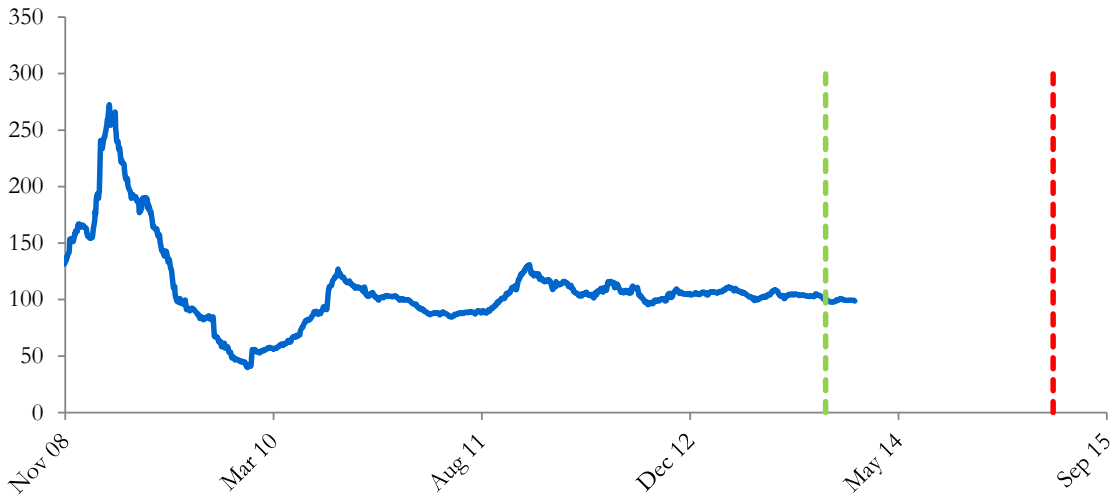
Investors purchasing these autocallable phoenix notes effectively sell contingent put options to Royal Bank of Canada and post the note's issue price as collateral to secure satisfaction of the investors' obligations under the option contracts. Royal Bank of Canada pays investors a contingent coupon that is part payment for the put options and part interest on the investors' posted collateral. This Trigger Phoenix Autocallable Optimization Security is fairly priced if and only if the difference between the contingent coupon and interest paid on Royal Bank of Canada's straight debt equals the value of the contingent put options investors are giving to Royal Bank of Canada. Whether this Trigger Phoenix Autocallable Optimization Security is suitable or not is identically equivalent to whether selling put options on the reference stock at the option premium being paid by Royal Bank of Canada was suitable for the investor.

Royal Bank of Canada's Stock Price



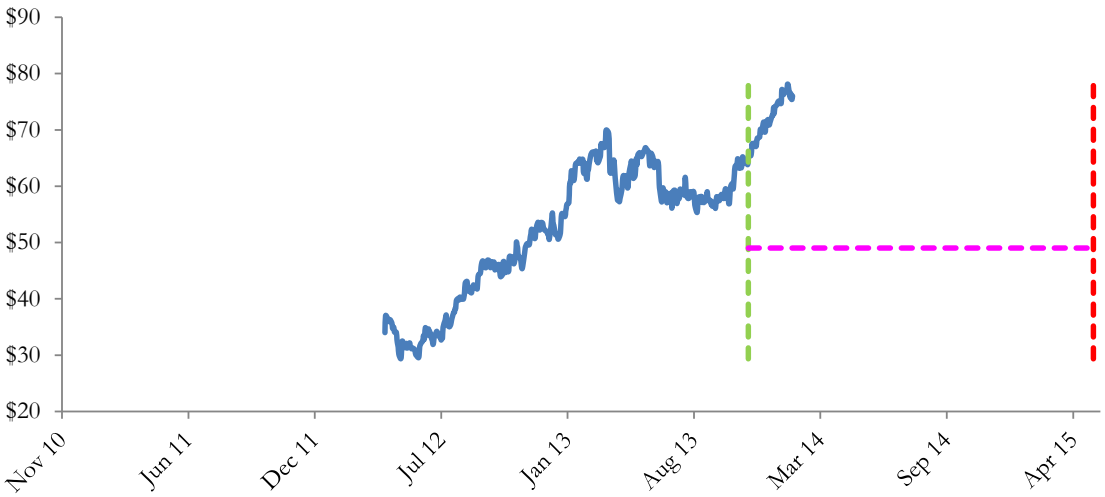
The graph above shows the adjusted closing price of the issuer Royal Bank of Canada for the past several years. The stock price of the issuer is an indication of the financial strength of Royal Bank of Canada. The adjusted price shown above incorporates any stock split, reverse stock split, etc.

Royal Bank of Canada's CDS Rate



Credit default swap (CDS) rates are the market price that investors require to bear credit risk of an issuer such as Royal Bank of Canada. CDS rates are usually given in basis points (bps). One basis point equals 0.01%. Higher CDS rates reflect higher perceived credit risk, higher required yields, and therefore lower market value of Royal Bank of Canada's debt, including outstanding Trigger Phoenix Autocallable Optimization Security. Fluctuations in Royal Bank of Canada's CDS rate impact the market value of the notes in the secondary market.

Phillips 66's Stock Price

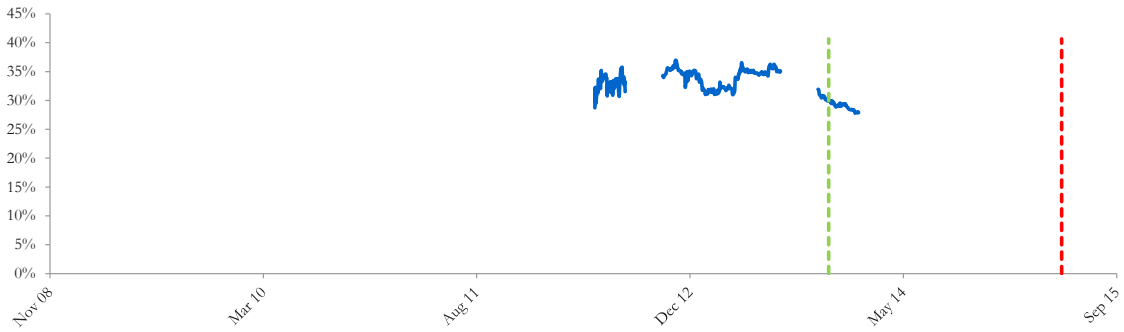


The graph above shows the historical levels of Phillips 66's stock for the past several years. The final payoff of this note is determined by Phillips 66's stock price at maturity. Higher fluctuations in Phillips 66's stock price correspond to a greater uncertainty in the final payout of this Trigger Phoenix Autocallable Optimization Security.

Realized Payoff

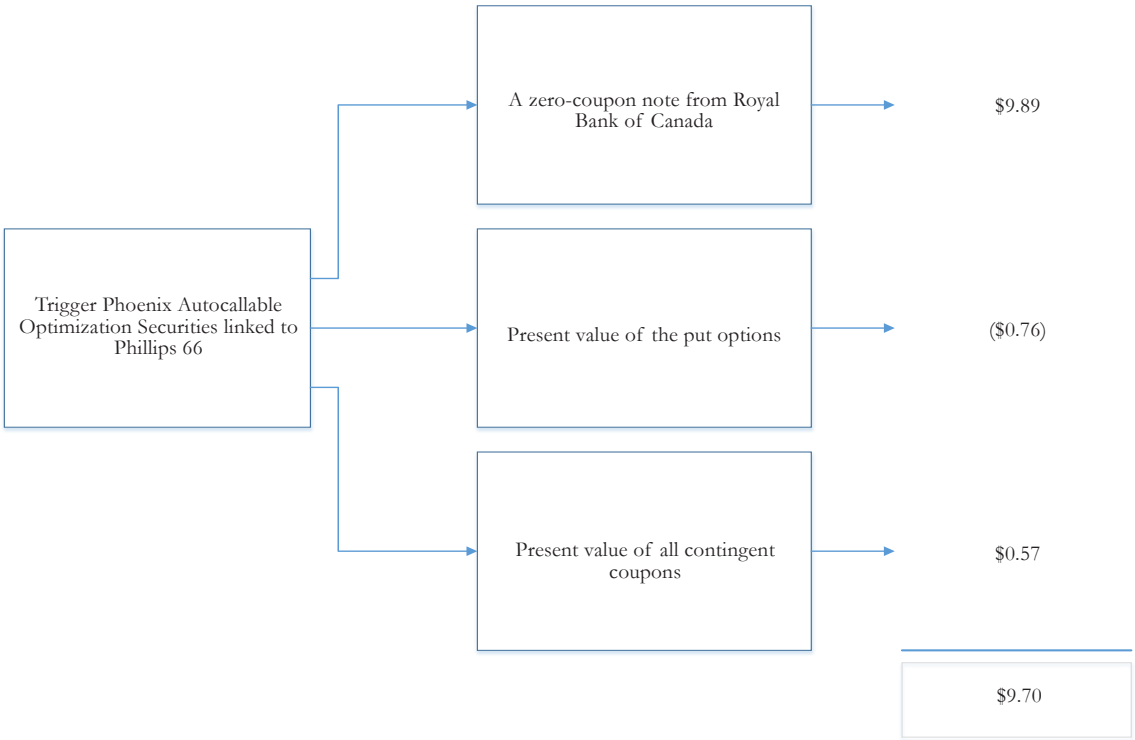
This product will mature on May 14, 2015.

Reference Asset Phillips 66's Stock's Implied Volatility



The annualized implied volatility of Phillips 66's stock on November 8, 2013 was 29.91%, meaning that options contracts on Phillips 66's stock were trading at prices that reflect an expected annual volatility of 29.91%. The higher the implied volatility, the larger the expected fluctuations of Phillips 66's stock price and of the Note's market value during the life of the Notes.

Decomposition of this Trigger Phoenix Autocallable Optimization Security



This note can be decomposed into different components, and each component can be valued separately. The chart above shows the value of each component of this Trigger Phoenix Autocallable Optimization Security.

1. Delta measures the sensitivity of the price of the note to the Phillips 66's stock price on November 8, 2013.
2. CDS rates can be considered a measure of the probability that an issuer will default over a certain period of time and the likely loss given a default. The lower the CDS rate, the lower the default probability. CDS rate is given in basis points (1 basis point equals 0.01%), and is considered as a market premium, on top of the risk-free rate, that investors require to insure against a potential default.
3. Fair price evaluation is based on the Black-Scholes model of the Phillips 66's stock on November 8, 2013.
4. Calculated payout at maturity is only an approximation, and may differ from actual payouts at maturity.
5. Our evaluation does not include any transaction fees, broker commissions, or liquidity discounts on the notes.