

Report Prepared On: 07/30/13

Structured Product Details

Name	PLUS Notes linked to Tempur-pedic International
Issue Size	\$7.65 million
Issue Price	\$1,000
Term	18 Months
Annualized Coupon	0.00%
Pricing Date	January 11, 2013
Issue Date	January 18, 2013
Valuation Date	July 11, 2014
Maturity Date	July 16, 2014
Issuer	Royal Bank of Canada
CDS Rate	104.64 bps
Swap Rate	0.60%
Reference Asset	Tempur-pedic International's stock
Initial Level	\$898.69
Dividend Rate	0.00%
Implied Volatility	50.17%
Delta¹	0.98
Fair Price at Issue	\$978.53
CUSIP	78011D823
SEC Link	www.sec.gov/Archives/edgar/data/1000275/000121465913000214/m113130424b2.htm

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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PLUS Notes linked to Tempur-pedic International

Description

Royal Bank of Canada issued \$7.65 million of PLUS Notes linked to Tempur-pedic International on January 18, 2013 at \$1,000 per note.

These notes are Royal Bank of Canada-branded PLUS securities that do not pay periodic coupons, but instead pay a single amount at maturity depending on Tempur-pedic International's stock price at maturity.

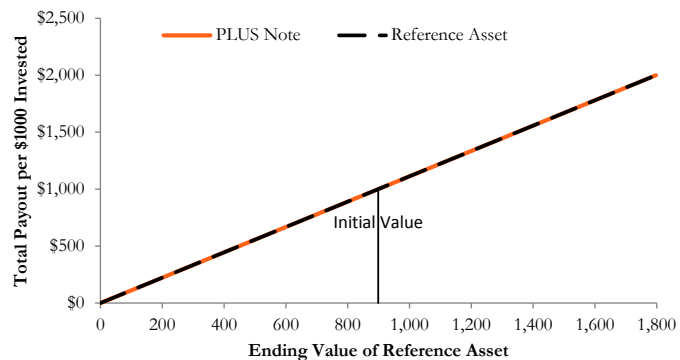
If Tempur-pedic International's stock price on July 11, 2014 is higher than \$898.69, the notes pay a return equal to the percentage increase in Tempur-pedic International's stock. If on July 11, 2014 Tempur-pedic International's stock price is below \$898.69, investors receive the face value per note reduced by the percentage decline in the reference asset. The notes will pay nothing at maturity if the reference asset declines to zero.

Valuation

This note can be valued as a combination of a note from Royal Bank of Canada, a short at-the-money put option, and one long at-the-money call option. The short at-the-money put option exposes investors to any decline in Tempur-pedic International's stock. For reasonable valuation inputs this note was worth \$978.53 when it was issued on January 18, 2013 because the value of the put option investors gave Royal Bank of Canada plus the interest investors would have received on Royal Bank of Canada's straight debt was worth \$21.47 more than the call options investors received from Royal Bank of Canada.

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

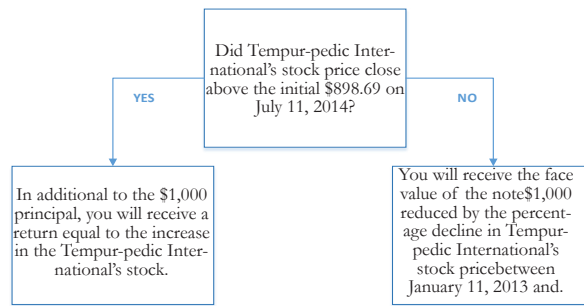


The payoff diagram shows the final payoff of this note given Tempur-pedic International's stock price (horizontal axis). For comparison, the dashed line shows the payoff if you invested in Tempur-pedic International's stock directly.

Principal Payback Table

Tempur-pedic International's Stock	Note Payoff
\$0.00	\$0.00
\$89.87	\$100.00
\$179.74	\$200.00
\$269.61	\$300.00
\$359.48	\$400.00
\$449.35	\$500.00
\$539.21	\$600.00
\$629.08	\$700.00
\$718.95	\$800.00
\$808.82	\$900.00
\$898.69	\$1,000.00
\$988.56	\$1,100.00
\$1,078.43	\$1,200.00
\$1,168.30	\$1,300.00
\$1,258.17	\$1,400.00
\$1,348.04	\$1,500.00

Maturity Payoff Diagram

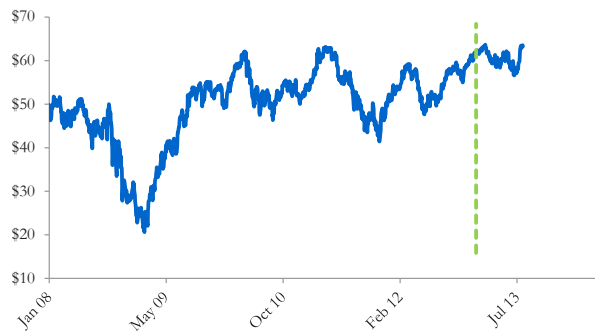


The contingent payoffs of this PLUS Note.

Analysis

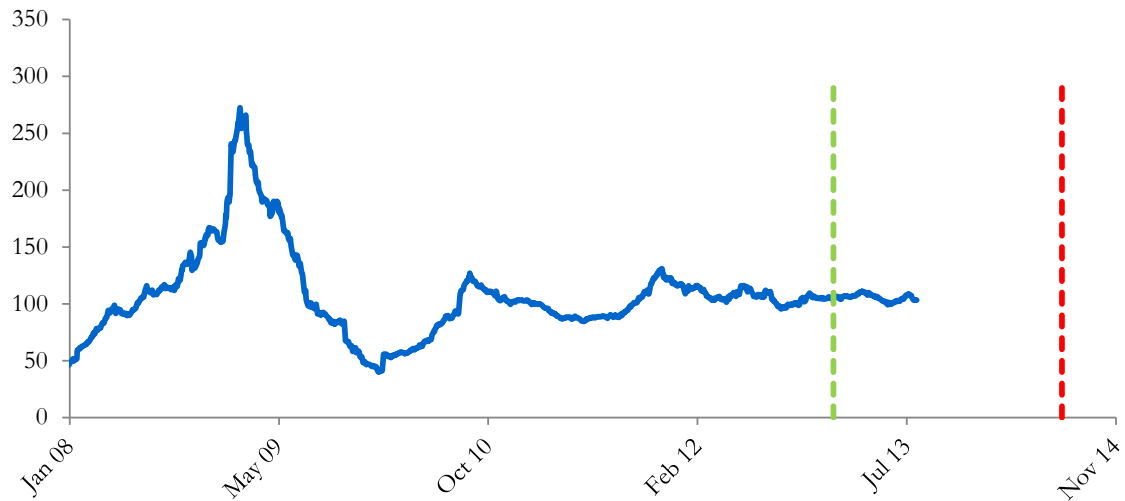
This PLUS Note pays investors the increase in Tempur-pedic International's stock, but if Tempur-pedic International's stock declines over the term of the note, investors will suffer losses equal to the percentage decline in Tempur-pedic International's stock. In addition, investors bear the credit risk of Royal Bank of Canada. Investors purchasing this PLUS Note effectively sell at-the-money put options to Royal Bank of Canada, buy at-the-money call options, and a zero-coupon note from Royal Bank of Canada. This PLUS Note is fairly priced if and only if the market value of the options investors received from Royal Bank of Canada equals the market value of the options investors gave Royal Bank of Canada plus the interest investors would have received on Royal Bank of Canada's straight debt.

Royal Bank of Canada's Stock Price



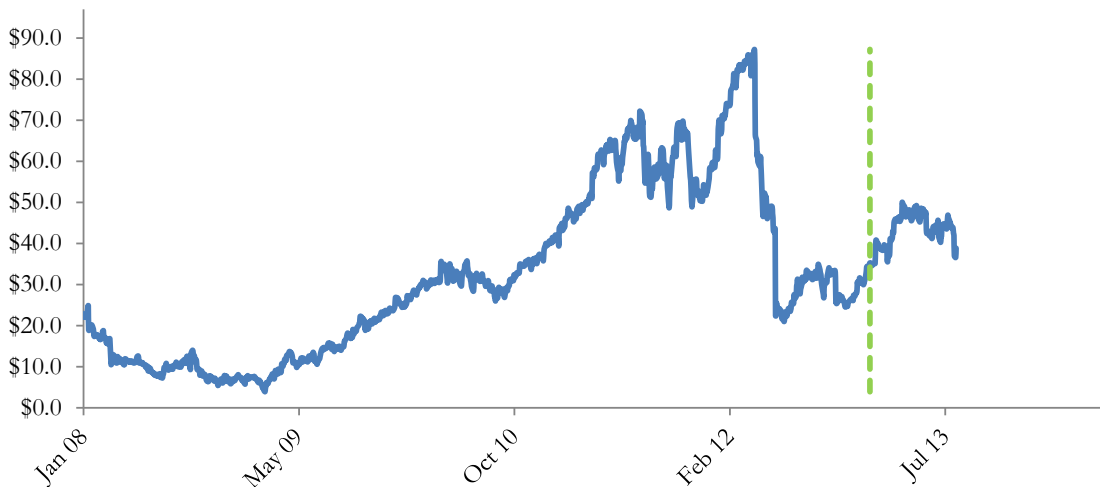
The graph above shows the adjusted closing price of the issuer Royal Bank of Canada for the past several years. The stock price of the issuer is an indication of the financial strength of Royal Bank of Canada. The adjusted price shown above incorporates any stock split, reverse stock split, etc.

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 PLUS Note. Fluctuations in Royal Bank of Canada's CDS rate impact the market value of the notes in the secondary market.

Tempur-pedic International's Stock Price

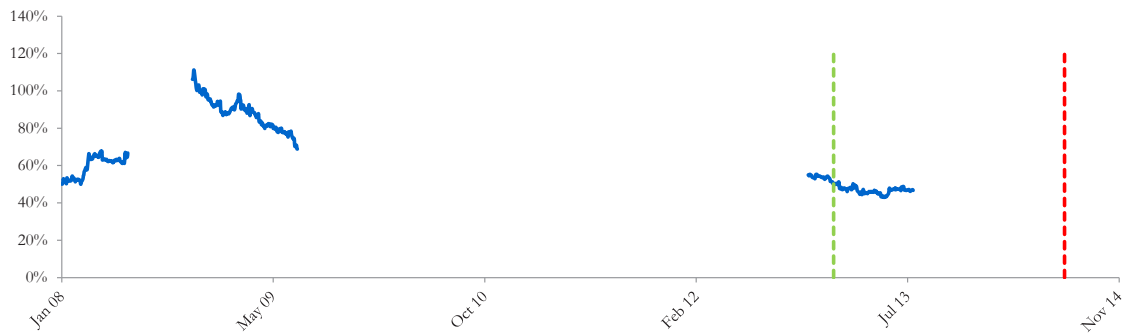


The graph above shows the historical levels of Tempur-pedic International's stock for the past several years. The final payoff of this note is determined by Tempur-pedic International's stock price at maturity. Higher fluctuations in Tempur-pedic International's stock price correspond to a greater uncertainty in the final payout of this PLUS Note.

Realized Payoff

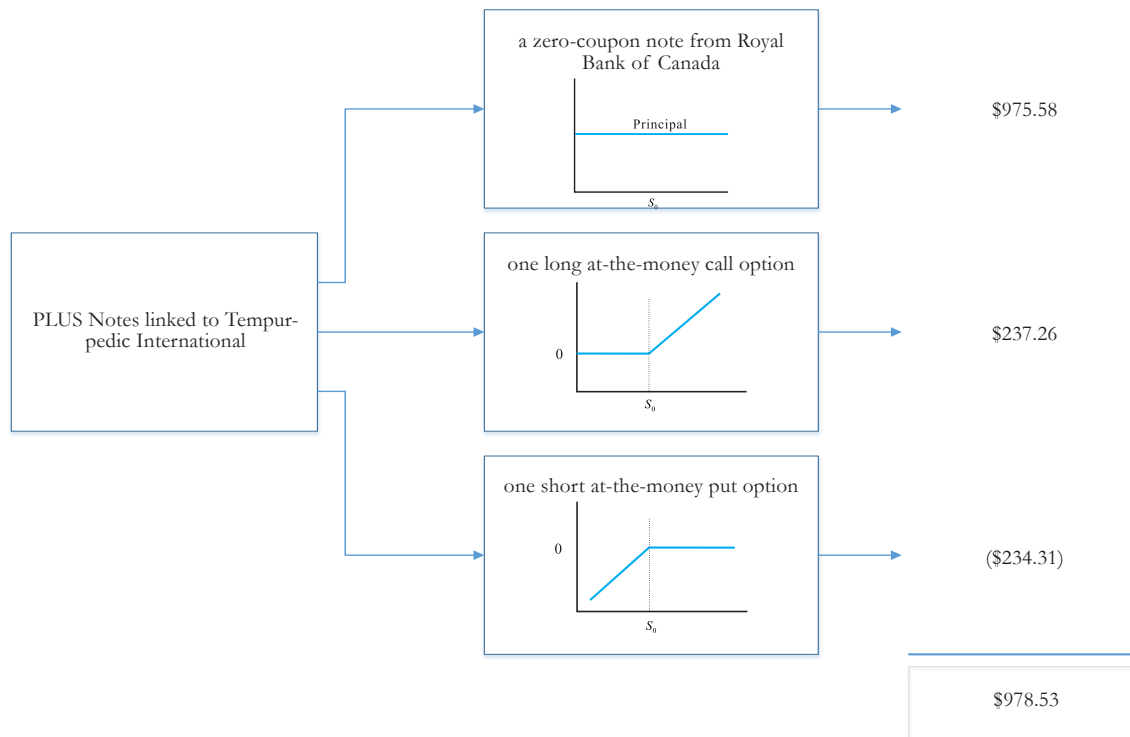
This product will mature on July 16, 2014.

Reference Asset Tempur-pedic International's Stock's Implied Volatility



The annualized implied volatility of Tempur-pedic International's stock on January 11, 2013 was 50.17%, meaning that options contracts on Tempur-pedic International's stock were trading at prices that reflect an expected annual volatility of 50.17%. The higher the implied volatility, the larger the expected fluctuations of Tempur-pedic International's stock price and of the Note's market value during the life of the Notes.

Decomposition of this PLUS Note



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 PLUS Note.

1. Delta measures the sensitivity of the price of the note to the Tempur-pedic International's stock price on January 11, 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 Tempur-pedic International's stock on January 11, 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.