

Report Prepared On: 10/25/12

## Structured Product Details

**Name** ELKS linked to Potash Corp. of Saskatchewan, Inc.

**Issue Size** \$5.22 million  
**Issue Price** \$10  
**Term** 6 Months  
**Annualized Coupon** 11.00%

**Pricing Date** October 25, 2011  
**Issue Date** October 28, 2011  
**Valuation Date** April 20, 2012  
**Maturity Date** April 25, 2012

**Issuer** Citigroup  
**CDS Rate** 189.38 bps  
**Swap Rate** 0.60%

**Reference Asset** Potash Corp. of Saskatchewan, Inc.'s stock  
**Initial Level** \$48.49  
**Conversion Price** \$48.49  
**Trigger Price** \$33.94  
**Dividend Rate** 0.50%  
**Implied Volatility** 42.46%  
**Delta<sup>1</sup>** 0.42

**Fair Price at Issue** \$9.61  
**Realized Return** 11.54%

**CUSIP** 17317U618  
**SEC Link** [www.sec.gov/Archives/edgar/data/831001/000131828111000205/ps\\_11-017341.htm](http://www.sec.gov/Archives/edgar/data/831001/000131828111000205/ps_11-017341.htm)

## ELKS linked to Potash Corp. of Saskatchewan, Inc.

### Description

Citigroup issued \$5.22 million of ELKS linked to Potash Corp. of Saskatchewan, Inc. on October 28, 2011 at \$10 per note.

These notes are Citigroup-branded reverse convertibles. These notes pay periodic interest coupons and at maturity convert into shares of Potash Corp. of Saskatchewan, Inc.'s stock, if the closing price of Potash Corp. of Saskatchewan, Inc.'s stock was ever below \$33.94 during the term of the notes. Similar securities are issued by other companies under different brand names.

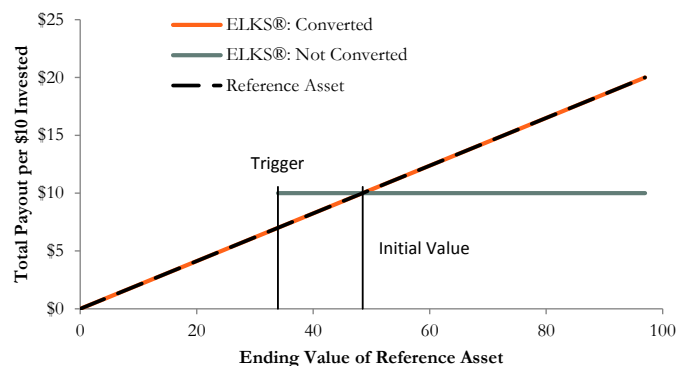
These 6-month notes pay monthly coupons at an annualized rate of 11.00%. In addition to the monthly coupons, at maturity on April 25, 2012 investors will receive the market value of 0.21 share of Potash Corp. of Saskatchewan, Inc.'s stock if during the term of the notes Potash Corp. of Saskatchewan, Inc.'s stock ever closed at or below \$33.94—70% of Potash Corp. of Saskatchewan, Inc.'s stock's \$48.49 closing price on October 25, 2011. Otherwise, investors will receive the \$10 face value per note. In either case, investors receive the final coupon payment at maturity.

### Valuation

This Citigroup ELKS linked to Potash Corp. of Saskatchewan, Inc. can be valued as a combination of a note from Citigroup, a short down-and-in at-the-money put option, and a long down-and-in at-the-money call option on Potash Corp. of Saskatchewan, Inc.'s stock. For reasonable valuation inputs this note was worth \$9.61 per \$10 when issued on October 28, 2011 because investors were effectively being paid only \$0.42 for giving Citigroup options which were worth \$0.81.

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 Potash Corp. of Saskatchewan, Inc.'s stock price (horizontal axis). For comparison, the dashed line shows the payoff if you invested in Potash Corp. of Saskatchewan, Inc.'s stock directly.

## Related Research

### Research Papers:

[www.slcg.com/research.php](http://www.slcg.com/research.php)

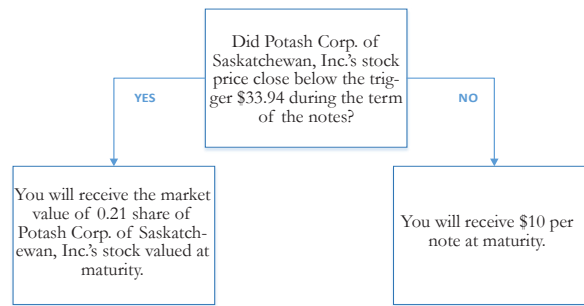
- "Are Structured Products Suitable for Retail Investors?" December 2006.
- "Structured Products in the Aftermath of Lehman Brothers," November 2009.
- "What TiVo and JP Morgan Teach Us about Reverse Convertibles," June 2010.

**Tim Dulaney, Ph.D.,**  
Senior Financial Economist, SLCG  
(+1) 703.539.6777  
[TimDulaney@slcg.com](mailto:TimDulaney@slcg.com)

## Principal Payback Table

Potash Corp. of Saskatchewan, Inc.'s Stock	Converted Note Payoff	Non-Converted Note Payoff
\$0.00	\$0.00	
\$4.85	\$1.00	
\$9.70	\$2.00	
\$14.55	\$3.00	
\$19.40	\$4.00	
\$24.25	\$5.00	
\$29.09	\$6.00	
\$33.94	\$7.00	\$10.00
\$38.79	\$8.00	\$10.00
\$43.64	\$9.00	\$10.00
<b>\$48.49</b>	<b>\$10.00</b>	<b>\$10.00</b>
\$53.34	\$11.00	\$10.00
\$58.19	\$12.00	\$10.00
\$63.04	\$13.00	\$10.00
\$67.89	\$14.00	\$10.00
\$72.74	\$15.00	\$10.00

## Maturity Payoff Diagram



The contingent payoffs of this ELKS.

## Analysis

The 11.00% annualized coupon rate is higher than the yield Citigroup paid on its straight debt but, in addition to Citigroup's credit risk, investors bear the risk that, at maturity, they will receive shares of Potash Corp. of Saskatchewan, Inc.'s stock at precisely the time when these shares are worth substantially less than the face value of the note.

Investors purchasing ELKS effectively sell down-and-in put options to Citigroup, buy down-and-in call option, and post the note's issue price as collateral to secure satisfaction of the investors' obligations under the option contracts. Investors are compensated by Citigroup through "coupon" payments that represent partial payment for the premium difference of put and call options as well as interest on the investors' posted collateral. This ELKS is fairly priced if and only if the excess of the reverse convertible's "coupon rate" above the interest Citigroup pays on its straight debt equals the net value of the put and call options investors are exchanging with Citigroup. Whether the purchase of this ELKS is suitable or not is identically equivalent to whether selling put options on the reference asset at the option premium being paid by the brokerage firm was suitable for the investor in question.

## Citigroup's Stock Price



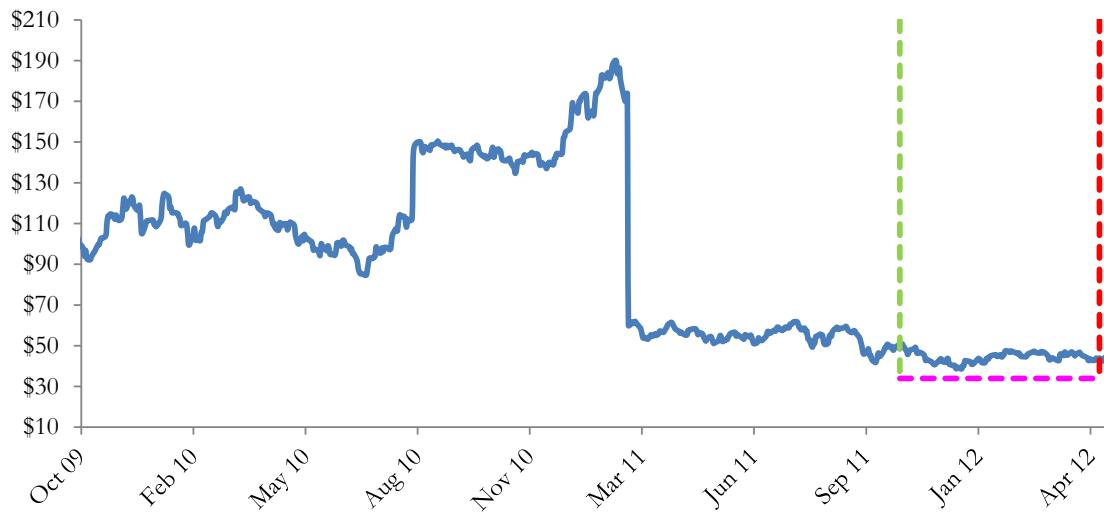
The graph above shows the adjusted closing price of the issuer Citigroup for the past several years. The stock price of the issuer is an indication of the financial strength of Citigroup. The adjusted price shown above incorporates any stock split, reverse stock split, etc.

### Citigroup's CDS Rate



Credit default swap (CDS) rates are the market price that investors require to bear credit risk of an issuer such as Citigroup. 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 Citigroup's debt, including outstanding ELKS. Fluctuations in Citigroup's CDS rate impact the market value of the notes in the secondary market.

### Potash Corp. of Saskatchewan, Inc.'s Stock Price

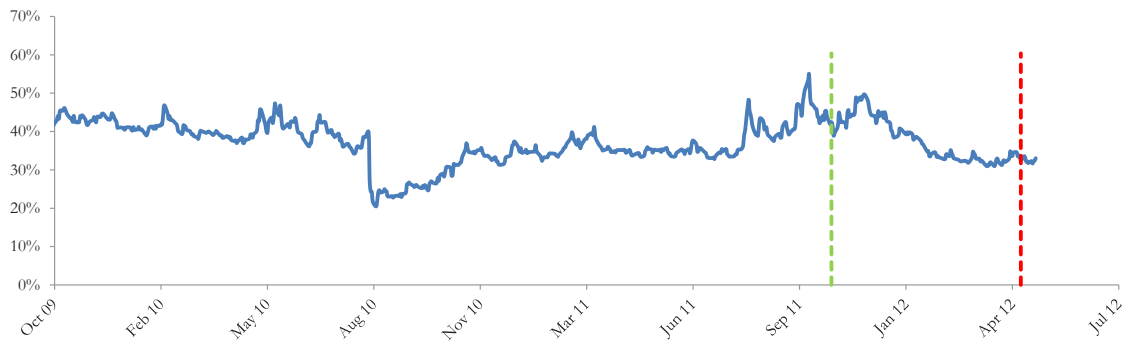


The graph above shows the historical levels of Potash Corp. of Saskatchewan, Inc.'s stock for the past several years. The final payoff of this note is determined by Potash Corp. of Saskatchewan, Inc.'s stock price at maturity. Higher fluctuations in Potash Corp. of Saskatchewan, Inc.'s stock price correspond to a greater uncertainty in the final payout of this ELKS.

### Realized Payoff

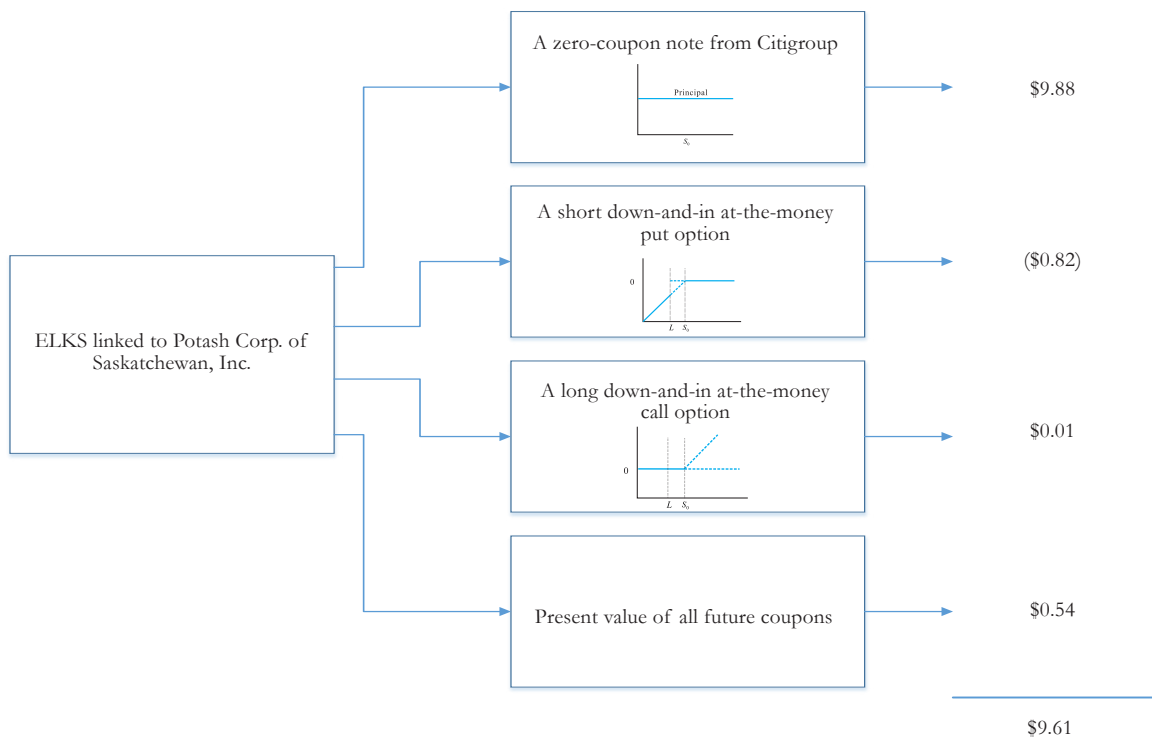
This note matured on April 25, 2012 and investors received \$10.00 per note.

## Reference Asset Potash Corp. of Saskatchewan, Inc.'s Stock's Implied Volatility



The annualized implied volatility of Potash Corp. of Saskatchewan, Inc.'s stock on October 25, 2011 was 42.46%, meaning that options contracts on Potash Corp. of Saskatchewan, Inc.'s stock were trading at prices that reflect an expected annual volatility of 42.46%. The higher the implied volatility, the larger the expected fluctuations of Potash Corp. of Saskatchewan, Inc.'s stock price and of the Note's market value during the life of the Notes.

## Decomposition of this ELKS



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 ELKS.

1. Delta measures the sensitivity of the price of the note to the Potash Corp. of Saskatchewan, Inc.'s stock price on October 25, 2011.
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 Potash Corp. of Saskatchewan, Inc.'s stock on October 25, 2011.
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.