INSTALMENT WARRANT MECHANICS

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Abstract

Instalment warrants are very popular in Australia and these instruments have been listed by Nedbank and Standard Bank in South Africa.

Instalments are financial products, that allow investors to gain direct exposure to shares by making a part payment upfront and delaying an optional final payment (or second instalment) until a later date (expiry date). This allows an investor to buy shares, and other securities, for a fraction of the current share price whilst receiving the benefits of capital growth and ordinary dividends.

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1 What are Instalments?

In simple terms, an instalment is a loan to buy shares. Instalments will enable you to either make a new investment that gives you exposure to shares of your choice, or you can borrow against shares you already own, releasing cash for other investments.

Either way, the loan amount can be repaid at any time until the instalment matures, however it is important to note that repayment is not compulsory. If the share price falls you do not have to repay the loan and you will not be subject to margin calls.

Essentially, a loan is created which reflects the value of the second instalment (or exercise price). When you buy an instalment you will also pay an interest amount for the loan and a borrowing fee.

Holders will generally be entitled to any distributions (dividends) that are paid on the underlying share. There is a difference between the instalments offered by Nedbank and Standard Bank. The difference is that the Nedbank instalments pay out the full dividend. So on the ex-dividend date the share instalment will drop in Rand terms by the full dividend amount and the investor will receive it in cash. The Standard Bank instalments are discounted in that you do not get the dividend so ex-dividend day will have no effect on the price of the share instalment.

To understand the pricing of an instalment warrant, we have to understand put-call-parity. This is explained next.

2 Put-Call-Parity

Put-call parity is a relationship that exists between the prices of European put and call options where both have the same underlier, strike price and expiry date [Hu 06]. This relationship is derived using arbitrage arguments [Ko 02]. Consider two portfolios consisting of

- A call option and an amount of cash equal to the present value of the strike price.
- A put option and the underlier.

In Figure 2 we compare the expiration value for these two portfolios, with x representing the common strike price.

What is significant about Figure 2 is the fact that the two portfolios (call + cash and put + underlier) have identical expiration values. Irrespective of the value of the underlier at expiration, each portfolio will have the same value as the other.

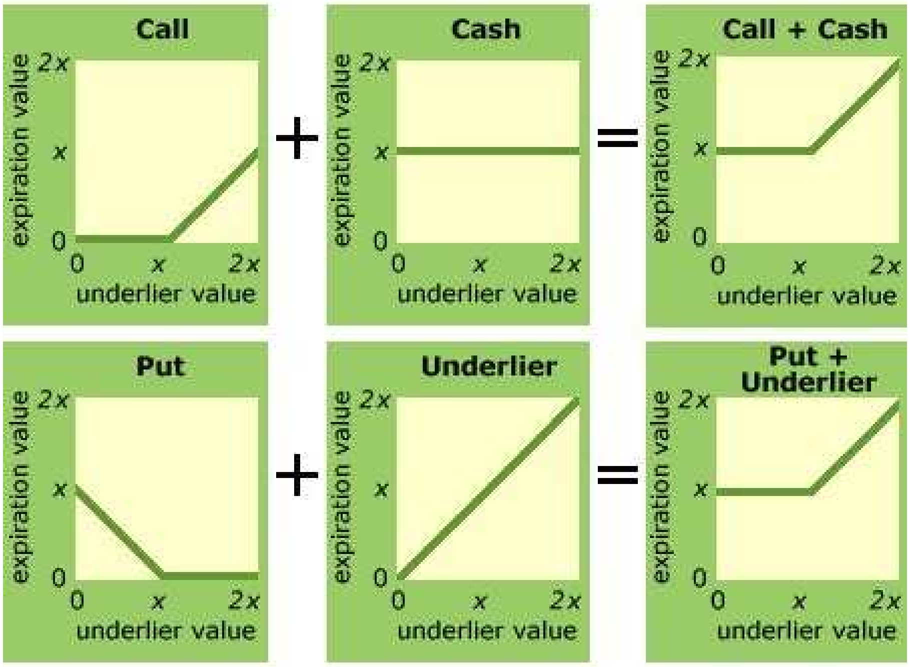

Figure 1: Put-Call Parity: Portfolios have Identical Expiration Values

A portfolio comprising a call option and an amount of cash equal to the present value of the option's strike price has the same expiration value as a portfolio comprising the corresponding put option and the underlier. For European options, early exercise is not possible. If the expiration values of the two portfolios are the same, then their present values must also be the same. This equivalence is put-call parity. See [Risk].

If the two portfolios are going to have the same value at expiration, then they must have the same value today. Otherwise, an investor could make an arbitrage profit by purchasing the less expensive portfolio, selling the more expensive one and holding the long-short position to expiration. Accordingly, we have the price equality

$$c + PV(x) = p + s \tag{1}$$

where

- c = the current market value of the call;
- $PV(x)$ = the present value of the strike price x, discounted from the expiration date at a suitable risk free rate r (here in continuous format);

- $p =$ the current market value of the put;
- $s =$ the current market value of the underlier.

Equation (1) is the put-call parity relationship. Note that it is not based on any option pricing model. It was derived purely using arbitrage arguments. It applies only to European options, since a possibility of early exercise could cause a divergence in the present values of the two portfolios.

Put-call parity offers a simple test of option pricing models. Any option pricing model that produces put and call prices that do not satisfy put-call parity must be rejected as unsound. Such a model will suggest trading opportunities where none exist.

Alternatively, consider the following 2 portfolios

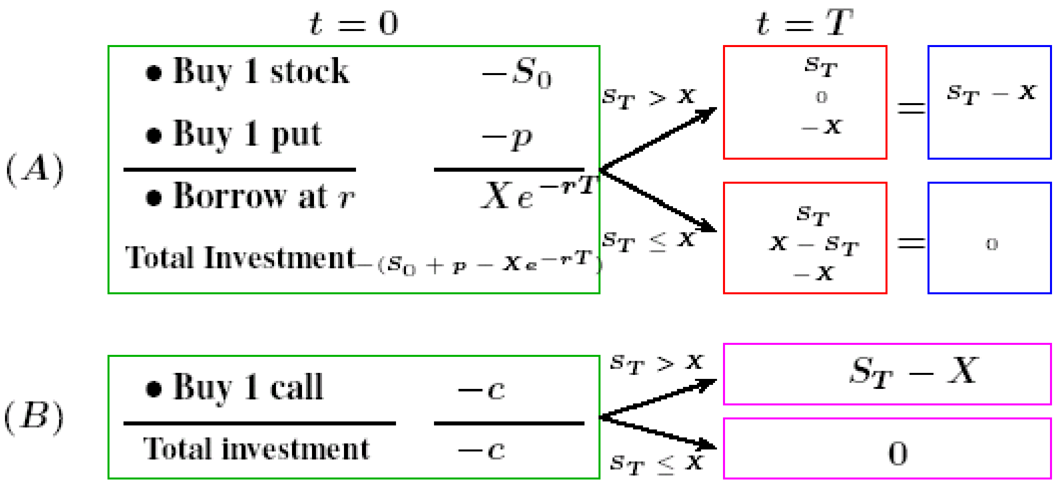

Figure 2: Put-Call Parity in portfolio format

Payoffs A and B in Figure 2 are the same and the risk is the same, hence the costs of A and B must be equal, i.e.

$$\begin{aligned} c &= S_0 e^{-dT} + p - Xe^{-rT} \\ \Rightarrow c - p &= S_0 e^{-dt} - Xe^{-rT} \end{aligned} \tag{2}$$

Equation (2) is general and the put-call-parity relationship here includes a dividend yield d.

3 The Instalment Warrant

From equation (2) and portfolio (A) in Figure 2 we see that we can replicate a long call with the following trades:

1. Buy the stock at S (take future dividend payments into account if necessary)

2. Buy a put with a strike at X

3. To do this, you have to borrow an amount Xe^{-rT}

What will actually happen

1. client buys share at S

2. client pays 50% of this and borrows the other 50%. Client pays interest on this.

3. client buys a put at a strike that is lower than the share price (usually 50% of the share price[1] on the issue date). After listing of instrument this strike remains fixed for the life of the instalment.

4 Pricing an Instalment Warrant

Let the following hold:
S is the current share price;
S_0 is the share price on the date of issue;
d is the current dividend yield of the share in NACA format;
α is the instalment multiplier or conversion ratio
K is the strike price given by

$$K = \alpha\, S_0.$$

Now, the pricing of an instalment is

$$V = S' + P(K) - PV \tag{3}$$

where P is the put with a strike price of K and PV is the present value of the loan to the investor given by

$$PV = \frac{K}{(1+r)^t}$$

with r the loan rate to the investor in NACA format and t the time till expiry.
S' is given by the following

$$S' = \begin{cases} S & \text{if dividends are given back to investor} \\ \frac{S}{(1+d)^t} & \text{if dividends are NOT given back to investor} \end{cases}$$

Equation (3) is just the put-call-parity relationship given in Equation (2).

[1] Instalments can have strike prices that are up to 90% of the share price. These are called "hot" instalments.

5 Funding Instalment Warrant

An investor that buys an instalment warrant buys a synthetic call option at a strike K. The question is, can the opposite be done? Can an investor buy a synthetic put using the above methodology? The answer is yes.

From equation (2) we can rewrite put-call-parity as follows

$$p = \left(c + Xe^{-rT} - S_0e^{-dT}\right) \tag{4}$$

During a trade, where we incorporate this methodology, the investor would

1. sell the share at S
2. receive 50% of this and deposit the other 50% with issuer. Investor receives interest on this.
3. buy a call at a strike that is higher than the share price (usually 50% above the share price on the issue date). After listing of instrument this strike remains fixed for the life of the instalment.

If the investor owns the shares, this method allows him/her to raise cash with the shares as collateral. The issuer can have a scrip lending agreement and on-lend the shares to the investor. The scrip lending cost is then incorporated into the valuation of this instrument.

Pricing is similar to that given by Equation (3) but changed slightly to

$$V = PV + C(K) - S' + S'\delta$$

with δ the scrip lending fee as a percentage if applicable.

6 Two Other Instruments

Using put-call-parity we can create instruments whereby investor synthetically short warrants. Rearranging equation (2) gives us

$$-C(K) = -P(K) + PV - S' + S'\delta \quad - \text{short call}$$

or

$$-P(K) = -C(K) - PV + S' \quad - \text{short put.}$$

7 Profits on Instalments

Profit on instalment warrants are made in a similar manner to profits on ordinary warrants i.e., through

1. the bid-offer spread;

2. buying the volatility wholesale and selling it at retail levels
3. delta hedging.

There is an extra factor though, the interest at which the investor borrows the money from the issuer — the interest rate spread is always in favour of the issuer.

References

[Hu 06] J. Hull, *Options, Futures, and other Derivatives*, 6^{th} Edition, Pearson International Edition (2006)

[Ko 02] A. A. Kotzé, *Equity Derivatives: effective and practical techniques for mastering and trading equity derivatives*, Workshop proceedings (2002)

[Risk] Riskglossary.com at http://www.riskglossary.com/link/put_call_parity.htm

There are some excellent web resources like

- http://203.15.147.66/products/pdf/instalment_warrants_getting_started.pdf
- http://thebull.com.au/experts/a/291-what-are-the-pros-and-cons-of-instalment-warrants.html
- https://www.warrants.standardbank.co.za/warrants/nsp/ContentManagement/DocumentDownloadPage.aspx?documentDownloadPageId=1