How to use the Options/Warrants Calculator?

1. Introduction

Options/Warrants Calculator is a tool for users to estimate the theoretical prices of options/warrants in various market conditions by inputting different parameters. The calculator can cater for stock options, index options, stock warrants, and index warrants.

IMPORTANT NOTE

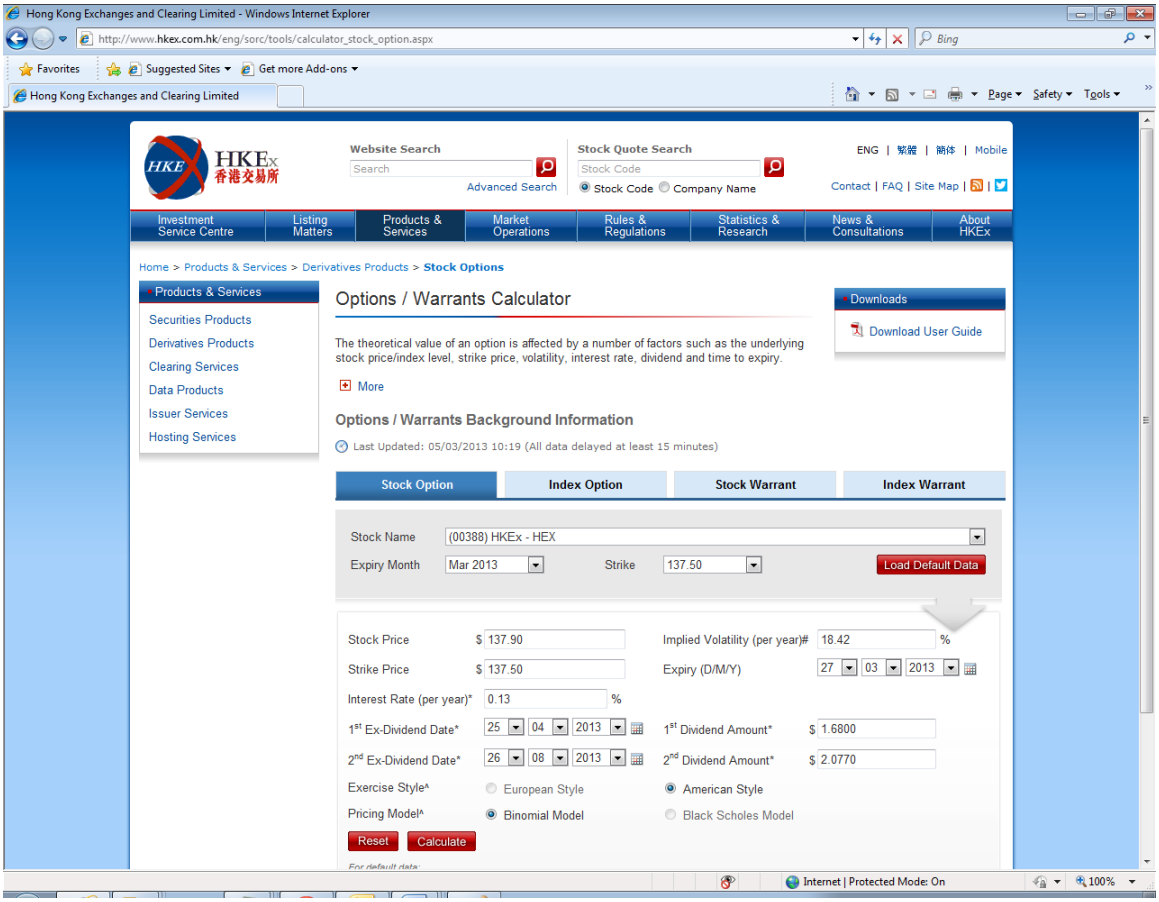
Please note that this calculator is an educational tool intended to help individuals learn how options and warrants work. The actual market environment may not be the same as what the theoretical models assume. Users of this calculator should not make investment decisions based upon values generated by it only.

2. Overview

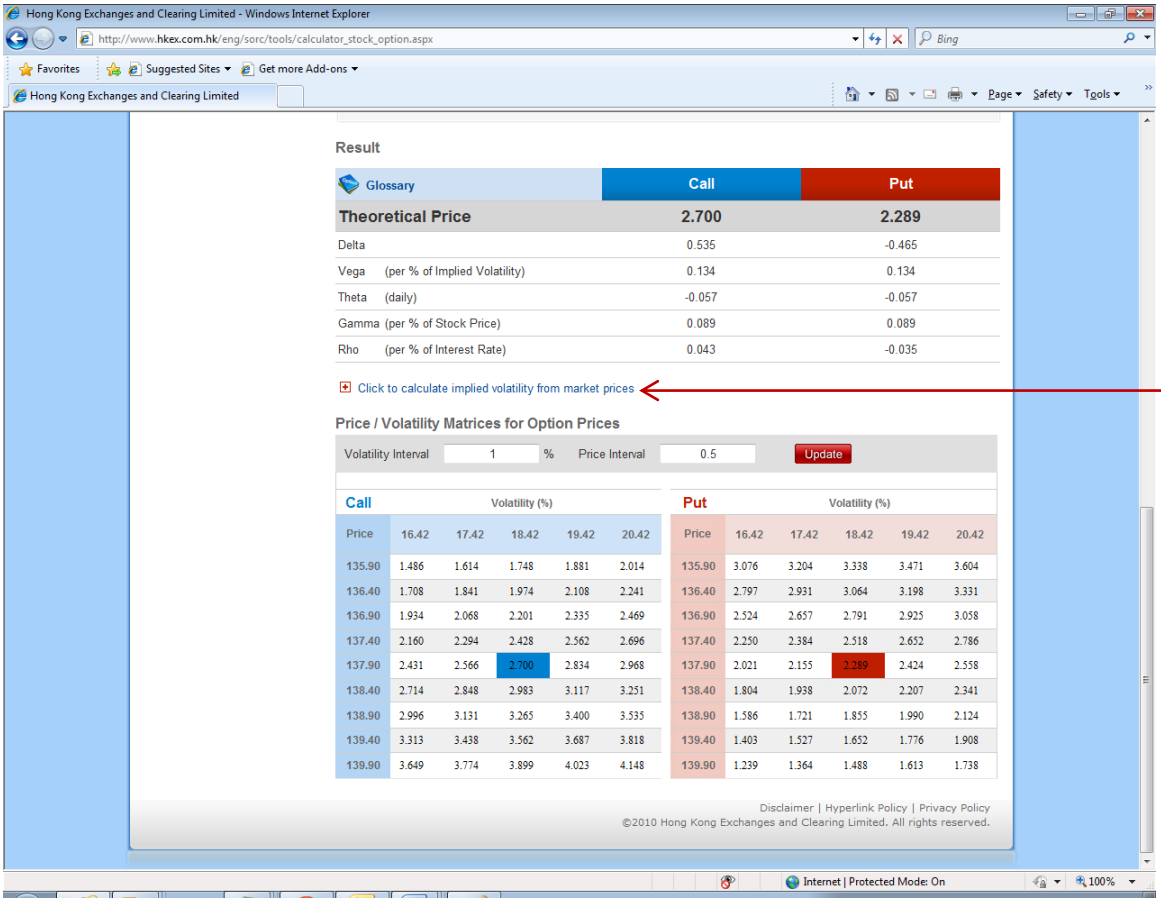
The calculator can cater for stock options, index options, stock warrants, and index warrants. Users can click respective tab to calculate the price of the corresponding instrument. The tool consists of four sections:

A. Data input section
B. Results section
C. Backward-compute implied volatility section
D. Price/Volatility matrices section

Users must complete data input section and press “Calculate” button in order to show the other three sections.



A. Data input section



B. Results section

C. Backward-compute implied volatility section

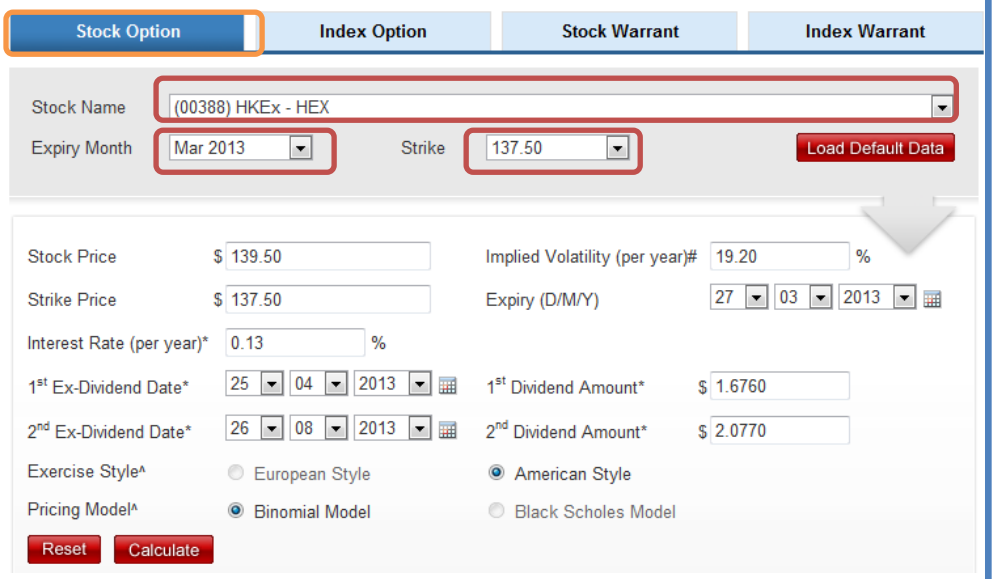
D. Price/Volatility matrices section

3. Using the calculator

The steps of evaluating stock/index options and warrants are very similar. Hence this document will focus on explaining the steps involved in evaluating stock options.

3.1 Stock Option tab

A. Data input section



*Users can fill in all input fields by themselves.

Step 1

Click Stock Option tab.

Step 2

Choose desired stock, contract expiry month and strike.

Step 3

Press Load Default Data ***.***

Stock price, implied volatility, strike price, expiry etc will be filled into input fields automatically.*

Step 4

After filled in the input fields, press Calculate ***.***

Results section, backward-compute implied volatility section, and price/volatility matrix section will be shown.

Note on default data:

1. *Implied volatility (IV) is calculated from last traded price of selected option series. If there is no trade of both call and put options during the day, IV from last trading day will be retrieved.*
2. *Interest Rate and Dividend information are provided by Reuters. Dividend information includes both actual and forecast values.*
3. *Exercise style of Stock Options listed on HKEx is American style. Binomial model is used to evaluate American style option.*

B. Results section

Theoretical prices of both call and put options

Result

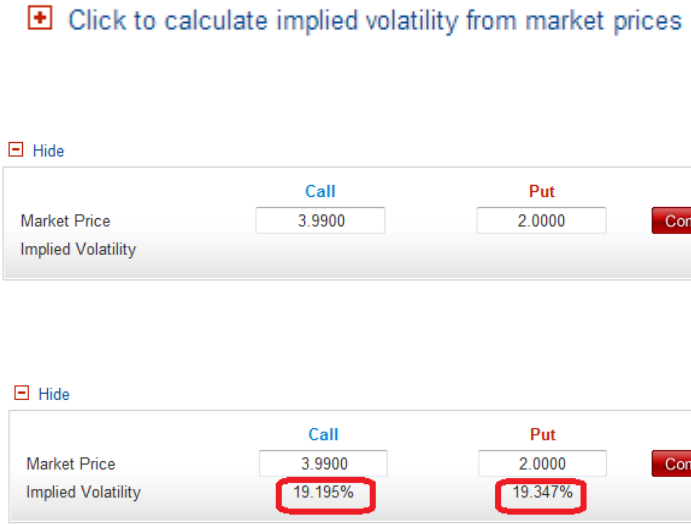
Glossary	Call	Put
Theoretical Price	**3.991**	**1.978**
Delta	0.620	-0.380
Vega (per % of Implied Volatility)	0.149	0.149
Theta (daily)	-0.052	-0.052
Gamma (per % of Stock Price)	0.074	0.074
Rho (per % of Interest Rate)	0.061	-0.036

Option greeks (risk parameters)

This section demonstrates the theoretical prices and option greeks (i.e. risk parameters) of both call and put options according to values in input section. Option greeks include delta, vega, theta, gamma, and rho. These greeks are widely used in understanding risks profile in option trading. For details of the meaning of each parameter, please click the icon and view the document.

C. Backward-compute implied volatility section

This section is for users who wish to backward calculate implied volatility from market prices of the selected options.



*Users are free to modify or input the values.

Step 1

Click to expand the section.

Step 2

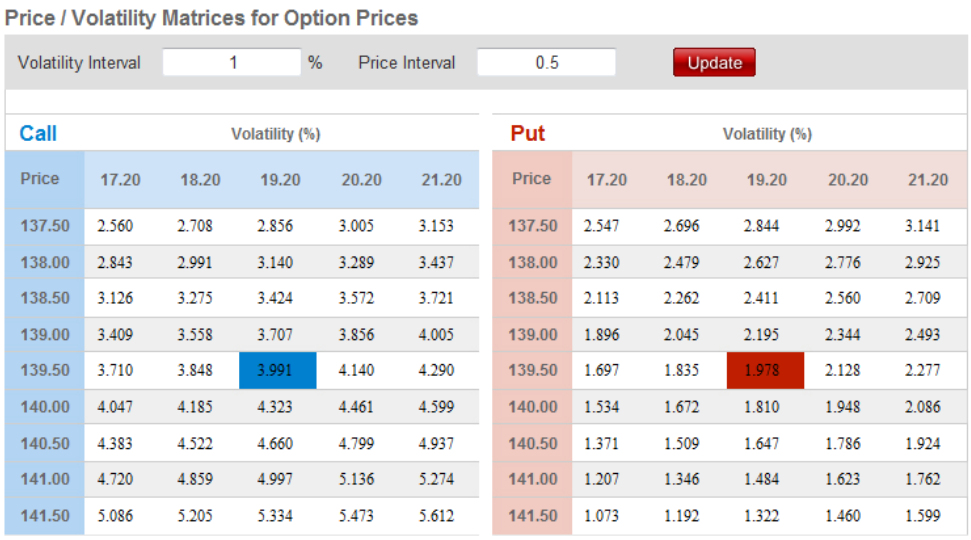
*Last traded prices of current trading date will be filled into the input boxes if available.**

Step 3

Press Compute Implied Volatility to calculate implied volatility from the options prices filled and other assumptions entered in the input section. Results are shown under the input boxes

D. Price/Volatility matrices section

This section provides a summary for option price changes with different stock prices and volatility assumptions. Users are free to modify the volatility interval and price interval of the matrices.



Price / Volatility Matrices for Option Prices

Volatility Interval 1 % Price Interval 0.5 Update

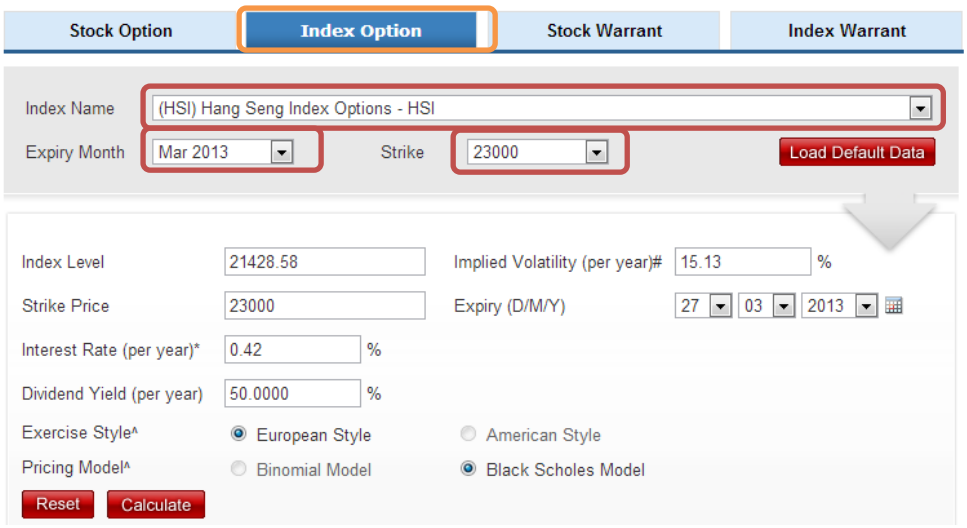
Call	Volatility (%)					Put	Volatility (%)				
Price	17.20	18.20	19.20	20.20	21.20	Price	17.20	18.20	19.20	20.20	21.20
137.50	2.560	2.708	2.856	3.005	3.153	137.50	2.547	2.696	2.844	2.992	3.141
138.00	2.843	2.991	3.140	3.289	3.437	138.00	2.330	2.479	2.627	2.776	2.925
138.50	3.126	3.275	3.424	3.572	3.721	138.50	2.113	2.262	2.411	2.560	2.709
139.00	3.409	3.558	3.707	3.856	4.005	139.00	1.896	2.045	2.195	2.344	2.493
139.50	3.710	3.848	3.991	4.140	4.290	139.50	1.697	1.835	1.978	2.128	2.277
140.00	4.047	4.185	4.323	4.461	4.599	140.00	1.534	1.672	1.810	1.948	2.086
140.50	4.383	4.522	4.660	4.799	4.937	140.50	1.371	1.509	1.647	1.786	1.924
141.00	4.720	4.859	4.997	5.136	5.274	141.00	1.207	1.346	1.484	1.623	1.762
141.50	5.086	5.205	5.334	5.473	5.612	141.50	1.073	1.192	1.322	1.460	1.599

Users are free to modify the volatility interval and price interval of the matrices.

The matrices help investors to estimate prices of their options invested under different volatility and stock prices.

3.2 Index Option Tab

A. Data input section



*Users can fill in all input fields by themselves.

Step 1

Click Index Option tab.

Step 2

Choose desired index, contract expiry month and strike.

Step 3

Press Load Default Data .

Index level, implied volatility, strike price, expiry etc will be filled into input fields automatically.*

Step 4

After filled in the input fields, press Calculate .

Results section, backward-compute implied volatility section, and price/volatility matrix section will be shown.

Note on default data:

1. *Implied volatility (IV) is calculated from last traded price of selected option series. If there is no trade of both call and put options during the day, IV from last trading day will be retrieved.*
2. *Interest Rate Information is provided by Reuters.*
3. *Exercise style of Index Options listed on HKEx is European style. Black Scholes Model is used to evaluate European style index option.*

For

B. Results section

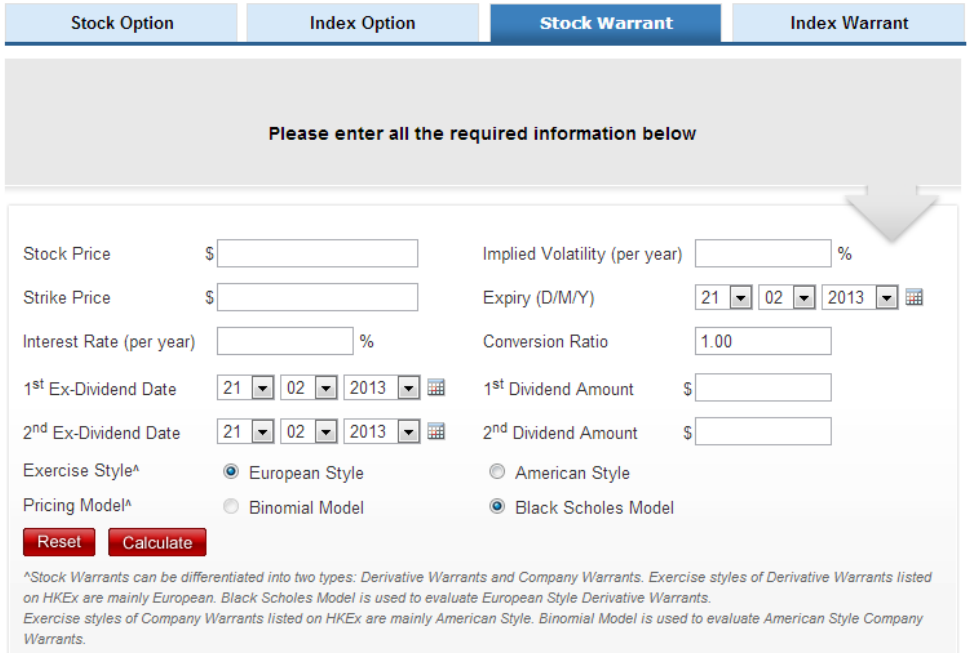
C. Backward-compute implied volatility section

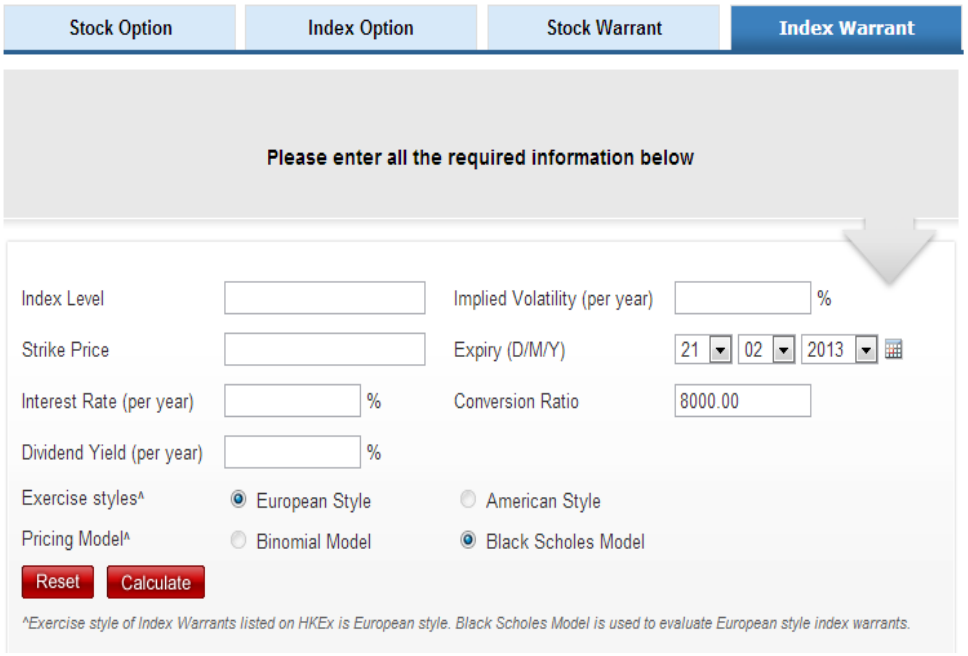
D. Price/Volatility matrices section

please refer to instructions in Stock Option Tab.

3.3 Stock Warrant Tab and Index Warrant Tab

A. Data input section





Step 1

Users are required to fill in all input fields by themselves.

Step 2

After filled in the input fields, press Calculate.

Results section, backward-compute implied volatility section, and price/volatility matrix section will be shown.

Note on warrants:

1. *Stock Warrants can be differentiated into two types: Derivative Warrants and Company Warrants. Exercise styles of Derivative Warrants listed on HKEx are mainly European. Black Scholes Model is used to evaluate European Style Derivative Warrants.*
2. *Exercise styles of Company Warrants listed on HKEx are mainly American Style. Binomial Model is used to evaluate American Style Company Warrants*
3. *Exercise style of Index Warrants listed on HKEx is European style. Black Scholes Model is used to evaluate European style index warrants.*

For

B. Results section

C. Backward-compute implied volatility section

D. Price/Volatility matrices section

please refer to instructions in Stock Option Tab.