

Mazars Corporate Finance

Pricing of warrants

31 August 2018

PharmaLundensis AB

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BACKGROUND AND ASSIGNMENT

- The Board of Directors in PharmaLundensis AB (publ) is planning to implement an incentive program that is based on warrants that will grant the right to buy shares in PharmaLundensis AB (publ), in this report referred to as “the Company”.
- The market price of the warrant must be estimated.
- Mazars Corporate Finance (“Mazars”) has been commissioned by the Board of Directors in the Company to evaluate the price of the warrant with the valuation date August 31, 2018, given specific assumptions.
- The underlying asset value refers to the share price of PharmaLundensis AB, quoted at the market Spotlight SE (Ticker PHAL, ISIN SE0003359710).
- The valuation object is a warrant that grants 1 share.
- This report is intended to serve as an independent valuation statement in the context described above and may not be cited or used for any other purposes without Mazars’ prior written consent. Please note that, within the scope of this assignment, Mazars has not audited nor verified the information received and, consequently, is in no way liable for the accuracy or completeness thereof.
- Representatives of the Company have received a draft of this report. Their points of view have been taken into consideration in the report.
- In preparing this valuation Mazars has reviewed, considered, discussed, and where considered appropriate, relied on certain financial and operation information for the company, and reports and information from financial databases.

About the Company

- PharmaLundensis AB operates as a pharmaceutical company in Sweden. It is conducting clinical research, which has completed Phase I and Phase IIa clinical stages for developing drug for the treatment of chronic obstructive pulmonary disease. The company was founded in 2006 and is based in Lund, Sweden.

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VALUATION METHOD – BLACK & SCHOLES

General

- A warrant entitles the holder the right but not the obligation to buy an underlying asset at a predetermined price. The obligation is upon the issuer of the warrant who is forced to carry through the transaction when/if the holder of the warrants wants to exercise.
- The main difference between warrants and options is that warrants are issued and guaranteed by the company, whereas options are exchange instruments and are not issued by the company.
- In order to acquire the right to buy an underlying asset in the future at a predetermined price you are usually required to pay a premium to the issuer, since the issuer takes a risk.
- The Black & Scholes formula is the best-known and mostly used model for valuation of options/warrants.

Valuation parameters

- The size of the premium depends on a number of parameters. When calculating the premium according to Black & Scholes, the following parameters are taken into account.
- Market value of the underlying asset (share price):
The market value of the underlying share refers to the current share price of the company.
- Exercise price
The exercise price refers to the price that the holder of the option/warrant is entitled to buy the underlying asset when the option/warrant expires.
- Risk-free rate of return
The risk free rate of return generally refers to a government bond with the same time to expiration as the warrants.
- Time to expiration
The time to expiration refers to the time between the acquisition of the option/warrant to the time when the option/warrant expires.

Valuation parameters (continued)

- Expected future volatility
The volatility is a measure of how much a share price deviates from its average value over a period of time. A common way to estimate future volatility is to calculate the historical volatility of the share and use that, with any appropriate adjustments for one-off events, as an approximation of future volatility. If the underlying asset refers to a share that is not quoted, or if the liquidity in the trading of the share is very limited, one can choose to estimate the future volatility in the underlying asset by analyzing the historical volatility in a selection of similar companies.
- Dilution of the shares
A warrant gives the holder the right, but not the obligation, to acquire a newly issued share. In connection to the new share issue the amount of shares increases which implies that the total value of the company is distributed on more shares than earlier. Further, the total value of the company is increased by an amount equal to the amount paid for the new shares. This causes a dilution which affects the value of the warrant and thus the theoretical value calculated by the Black & Scholes formula has to be adjusted.

Tax implications

- If the warrant/option is deemed to constitute a benefit for the employee the possible profit related to the warrant may be taxed as salary and not as income of capital according to Swedish tax law. In order to incur capital gains tax on a possible profit, the warrants should be valued and issued at a market value.

PREREQUISITES FOR THE VALUATION

Parameters

- The warrants entitles to acquire a maximum of 700 000 new shares in the Company.
- The current number of shares in the Company amounts to 21 274 621. A new share issue of 700 000 shares would result in a 3.2% dilution of the current shareholders.
- The average volume wheighted share price during the trading days 17 August to 30 August 2018 has amounted to SEK 3.08. This value constitutes the underlying asset value of the warrant.
- The strike price of the warrant is set to amount to SEK 18.5 which corresponds to 600% of the underlying asset value.
- The warrants are set to expire after a duration of 3 years.
- The risk free interest rate for a duration of 3 years has been estimated by interpolating a 5 year Swedish government bond and a 2 year Swedish government bond. Mazars has estimated the risk free interest rate to 0%.

Dilution

Dilution	
No. of shares before exercise	21 274 621
No. of new shares	700 000
No. of shares after exercise of warrants	21 974 621
Dilution	3,2%

Source: Information from the Board of Directors in the Company, Mazars analysis

Underlying share price

Date	Closing	High	Low	Average price	Volume	Average price x volume
August 30, 2018	3,1	3,1	2,91	3,01	7 140	21 456
August 29, 2018	2,95	3	2,91	2,96	11 627	34 358
August 28, 2018	2,91	3,01	2,91	2,96	4 550	13 468
August 27, 2018	3,01	3,27	2,93	3,10	7 191	22 292
August 24, 2018	3,07	3,28	2,93	3,11	5 718	17 754
August 23, 2018	3,12	3,13	2,9	3,02	3 222	9 714
August 22, 2018	3,04	3,39	3	3,20	12 648	40 410
August 21, 2018	3,33	3,4	2,2	2,80	17 655	49 434
August 20, 2018	3,18	3,29	3,17	3,23	31 301	101 102
August 17, 2018	3,21	3,49	3,21	3,35	3 139	10 516
					104 191	320 505
Average volume weighted price						3,08

Source: S&P Capital IQ

ESTIMATION OF FUTURE VOLATILITY

Volatility estimation

- Warrant valuation requires an estimate of the future volatility of the underlying asset for the remaining time to expiration. The volatility is a measure of how much a share price deviates from its average value over a period of time.
- The PharmaLundensis share is listed at a market place. However the liquidity of the share is low with a limited number of transactions per day, and during some days there are no transactions recorded. Mazars deems that a measure of historic volatility will not constitute a reliable and representative basis for an estimate of a market price of the warrants.
- Mazars view in this case is that a peer group analysis will provide a better basis for estimating a representative market rate of the Black & Scholes parameter for the future volatility.
- The table to the right illustrates the volatility of the selection of comparable Nordic listed companies in similar businesses. (For further details regarding the companies in the peer group, refer to Appendix). The average volatility of the comparable companies has been measured over different time periods. The total average of the measured periods amounts to **37%**. Mazars deems that this constitutes a reasonable Black & Scholes assessment of future volatility in the PharmaLundensis share.

Peer Group

Company	Volatility 1 years	Volatility 2 years	Volatility 5 years
ALK-Abelló A/S	37%	30%	31%
BioGaia AB	29%	28%	31%
Biotec Pharmacon ASA	38%	41%	55%
Elekta AB (publ)	28%	26%	32%
Genmab A/S	38%	33%	36%
H. Lundbeck A/S	39%	34%	33%
Medivir AB (publ)	43%	44%	43%
Oasmia Pharmaceutical AB (publ)	53%	52%	48%
Orion Oyj	39%	34%	29%
Swedish Orphan Biovitrum AB (publ)	31%	26%	33%
Average	38%	35%	37%

Source: S&P Capital IQ

COMPUTATION OF MARKET VALUE

Input

Mazars has calculated the price of the warrant by using the Black & Scholes formula. The following parameters has been used in the calculation:

- Underlying share price: SEK 3.08 per share
- Strike price: SEK 18.5 per share
- Estimated future volatility: 37%
- Time to maturity: 3 years
- Estimated risk free interest rate for a duration of 3 years: 0%.
- A new share issue of an additional 700 000 shares at the expiry of the warrants would result in a 3.2% dilution of the current shareholders.

Conclusion – Market value of warrant

- Based on the assumptions and parameters presented in this report, Mazars estimates the market value of one warrant to **SEK 0.0035**.

Helsingborg 31 August 2018



Fredrik Carlsson

Parameters

	Parameter
Share price	3,08 SEK
Strike price	18,5 SEK
Interest rate	0,0%
Volatility	37%
Time to expiration (years)	3,0
Dilution	3,2%
Theoretical value of warrant incl dilution	0,0035 SEK

APPENDIX – PEER GROUP

Company	Country	Industry	Business description
ALK-Abelló A/S	Denmark	Pharmaceuticals	ALK-Abelló A/S, a pharmaceutical company, develops, manufactures, and sells a range of products for the diagnosis, prevention, and treatment of respiratory allergy and allergic asthma in Europe, North America, and internationally.
BioGaia AB	Sweden	Biotechnology	BioGaia AB (publ) develops, markets, and sells probiotic products with documented health benefits worldwide.
Biotec Pharmacon ASA	Norway	Biotechnology	Biotec Pharmacon ASA, together with its subsidiaries, develops, manufactures, and markets immune modulating beta-glucans and recombinant enzymes in Norway.
Elekta AB (publ)	Sweden	Healthcare Equipment	Elekta AB (publ) provides equipment and software for cancer and brain disorders worldwide.
Genmab A/S	Denmark	Biotechnology	Genmab A/S, a biotechnology company, develops antibody therapeutics for the treatment of cancer primarily in Denmark.
H. Lundbeck A/S	Denmark	Pharmaceuticals	H. Lundbeck A/S engages in the research, development, production, and sale of pharmaceuticals for the treatment of psychiatric and neurological disorders in Denmark and internationally.
Medivir AB (publ)	Sweden	Biotechnology	Medivir AB (publ) researches, develops, and sells pharmaceuticals primarily for the treatment of oncology in Europe, the Nordic region, the United States, and the rest of the world.
Oasmia Pharmaceutical AB (publ)	Sweden	Biotechnology	Oasmia Pharmaceutical AB (publ) develops, manufactures, markets, and sells drugs in the field of human and veterinary oncology primarily in Sweden.
Orion Oyj	Finland	Pharmaceuticals	Orion Oyj engages in the development and manufacture of pharmaceuticals, active pharmaceutical ingredients (APIs), and diagnostic tests worldwide.
Swedish Orphan Biovitrum AB (publ)	Sweden	Biotechnology	Swedish Orphan Biovitrum AB (publ), an integrated biotechnology company, researches, develops, manufactures, and sells pharmaceuticals in the therapeutic areas of haemophilia, inflammation, and genetic and lysosomal diseases.

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