# TUTORIAL 3

***Momentum Trading Strategy***

# TASK ONE

Read the essay below and then answer the questions at the end.

Is there any evidence of momentum in the warrants markets? Develop a methodology to test this strategy in the options markets.

Momentum defies the notion that efficiency in the markets exist because momentum relies on markets to either over-react or under-react in order to obtain abnormal returns. As defined by Jegadeesh and Titman (1993), momentum is a trading strategy where traders buy well performing stocks and sell poor performing stocks based on their past performances. Their research found that as long as over-reaction or under-reaction exist, momentum strategies can be adopted. They applied their strategies to that of the New York (NYSE) and American Stock Exchange (AMEX) and were able to achieve excess returns in those markets.

Arena et al. (2008), Fetcher (2007) and Campbell et al. (2001) discussed about the existence of idiosyncratic volatility (IVol). Most recently, Arena et al. (2008) were able to find a link between 'IVol' risk and the momentum effects in stock returns. Furthermore, they found that stocks with higher 'IVol' displayed greater momentum than do stocks with lower IVol. Moreover, Arena et al. (2008) found that high IVol stocks experienced quicker and larger reversals and found evidence suggesting that momentum profits was due to under-reactions from firm-specific information.

Lee and Swaminathan (2000) found evidence of momentum in the United States. Their research found that past trading volume may not help in predicting future returns but help to indicate a momentum reversal. Other studies that shows evidence of momentum profits includes Cleary and Inglise(1998) in Canada, Rouwenhorst (1998) in Europe, Rouwenhorst (1999) in emerging markets, Chan, Hameed and Tong (2000) in 23 stock market indices, Liu and Lee (2001) in Japan, Hameed and Kusnadi (2002) in Asian markets, Kang, Liu and Ni (2002) in China, Hurn and Pavlov (2003) in Australia and Gunasekarge and Kot (2007) in New Zealand.

More recently, Ramiah, Naughton and Veeraraghavan (2009) found substantial momentum profits in Singapore and that trading volume can only predict the persistence and reversal of momentum patterns with holding periods beyond one year.

It should be noted that applying a momentum trading strategy in the physical equity market may not be a practical approach given that there are short selling restrictions in the equity markets, even though they vary from country to country. For example, naked short selling is banned in Australia. Therefore, creating a zero cost portfolio such as the one mentioned in the methodology for Ramiah, Naughton and Veeraraghavan (2009) would not be viable in the real world.

While momentum trading are more commonly applied to the typical stock markets, we do find that momentum has been tested in the warrants market. Ramiah et al (2007) for instance tested this strategy in the Australian warrants markets. We also find that Naughton, Sy and Ramiah (2007) apply momentum strategies in the warrant markets in six asian countries. (i.e: HK, Japan, Korea, Malaysia, Singapore and Taiwan).

Therefore using the methodology applied by Lee and Swaminathan (2000); and Ramiah et al. (2007), the following strategies will be implemented to measure momentum returns in the options market.

**Methodology**

Applying momentum trading in the options market is very similar to applying it to the normal equity markets. We have a range of equity stocks with corresponding options attached and we establish portfolios. Of the winners, we choose the top ten options and for the losers, we choose the bottom ten options. Hence we have established the winner portfolios and the losers portfolios in the options market.

Ramiah et al. (2007) developed a methodology to find evidence of momentum in the options market. We will adopted this strategy and use the ASX 200 as our market proxy. From the ASX200, we will only use stocks which have a corresponding option available. Any stock that does not follow the criteria will be excluded. We will use the past five years to obtain data on the daily price movement of all the stocks with options available and also obtain data on the price movements of the options themselves. Any stocks or options that does not have a minimum of five years of data will not be used in our methodology.

Daily returns will then be calculated on the stocks and their options as follows:

**Stock Return Formula**

 Equation 1

Where:

LRsi is the daily log return for stock *i*.

Pst is the stock return index for stock *i* at time t.

Pst-1 is the stock return index for stock *i* at time t-1.

**Option Return Formula**

 Equation 2

Where:

LRoi is the daily return for warrant *i*.

Pot is the warrant return index for warrant *i* at time t.

Pot-1 is the warrant return index for warrant *i* at time t-1.

The equity portfolio construction is similar to that of Lee and Swaminathan (2000). Equity portfolios will be formed on a daily basis. At the beginning of each day all eligible stocks are ranked independently on the basis of past returns for the return momentum. The stocks are then assigned to two portfolios based on their returns over the past J days (where J = 1, 5, 10, 20, 30, 40, 50 and 60 days respectively). Next the portfolios are held for K days (where J = 1, 5, 10, 20, 30, 40, 50 and 60 days respectively). Returns for K-days holding period are based on equally weighted average returns of every stock in the portfolios. The extreme winner and loser deciles over the next K days and next 60 days then form the main focus. The equity momentum strategies employed here buy the winner portfolio and sell the loser portfolio for different holding and formation periods.

Jegadeesh & Titman (1993), Ramiah (2007) put forward the notion of restricted and non-restricted short selling. We know that the returns are rather significant with the unrestricted compared to the restricted short-selling of the losers portfolio. However, instead of applying short-selling for the loser portfolio, we can instead write these warrants. As such for the loser portfolios, we can write call and put options. With this idea in place, we can adopt different scenarios in which these ideas can be used.

**First Scenario**: In the presence of a bearish market, we will purchase the winner portfolio in the equity market and for the loser portfolio, we will be writing call options in order to obtain a premium (profit).

**Second Scenario**: In the presence of a bullish market, we will purchase the winner portfolio in the equity market. And for the loser portfolio, we will be writing put options in order to obtain a premium (profit).

It could be profitable or feasible to buy the winners not in the equity market but in the options market alone. Therefore we can set in place portfolios, explained earlier, for the winners with the make-up of options. Ultimately, we can use the options market to develop the winners and loser portfolio. From there we can develop more scenarios.

**Third Scenario**: To buy winners in the options market instead of in the equity market, we can take up and buy a put option in a bearish market.

**Fourth Scenario**: Buy the winner portfolio in the options market and sell the loser portfolio of options to generate a profit. We will then sell the loser portfolio in the options market via writing them. Therefore if a bearish market was present, we will be writing call options to obtain a premium. Or if it was a bullish market, we will be writing put options to obtain a premium.

**Conclusion**

Momentum trading strategies are most commonly applied to the physical stock markets around the world. Despite this, we can see that momentum trading can be extended and applied beyond these markets. Ramiah et al (2007) has applied momentum trading strategies in the Australian warrants market and Naughton et al (2007) has conducted research in warrants and options in six Asian countries. Both have found that momentum in the warrants or derivative markets exist and could even be more profitable than a momentum trading strategy made on the physical stock market. By employing the techniques similar to that used by Ramiah et al (2007), we can develop a methodology that tests momentum in the options market.

This essay was written by a student and your task for this week will be to critically analyze this essay.

Hints: Check if the following were covered adequately by the student

1. Define the terms using the right finance terminologies
2. Quote the leading paper
3. Latest publication in the area
4. Is this a complete literature review
5. Is there a gap in the literature?
6. Rationale for research
7. Innovative methodology
8. Any useful lesson(s) learnt from this essay (conclusion)?
9. What more can be done to improve this essay
10. Grade this essay out of 100.

# [One Hour]