Study on Effect of Jumping Risk and Volatility Risk on TAIEX Option Return

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Abstract: Due to the low profits in recent years environmental, as well as the development of financial engineering that promote the derivatives trading volume increased. Moreover, the fastest-growing of selected right and the lack of research about option risk. This study aim to explore the relationship between the risk and reward of selected right in Taiwan index. This study focus on the pricing the jump risk of selected right in Taiwan index. Using cross-sectional data as a 12-month study period, using the iteration method to research the effects of abnormal returns, the result shows that different risk factors of fluctuations affected the abnormal returns obviously will cause risk premium as well as the jump risk which consistent with the theory of behavioral finance. However, according to traditional finance theory, contrary to the results of this study consider that higher risks should generate higher-paying as well. According this study, the investors in behavioral finance in modern financial theory is not rational, and the trading behavior is non-random, moreover, the financial market is non-efficiency. Instead, the high risk low reward.

Key Words:- Jumping risk, TAIEX Option Return

1 Introduction

With low-interest environment in recent years, investment of financial commodity was unable to meet the requirements of necessary paid by society. Therefore, the traditional financial tool are replacing with derivative financial commodity which are high risk, high lever, and high complex; including option, forward contract, futures, credit default swap, and collateralized debt obligations .

Global Board Options Exchanges were founded in 1983 that S&P500 (SPX) index option which launched by the Chicago Board Options Exchange (CBOE), moreover CBOE is the option which target on trade index at the earliest. And, CBOE is the most popular exchange with option trade. Taiwan Futures Exchange (TFE) launched Taiwan weighted index options (TXO) in December 2001 and, and launched stock options in 2003. Currently TXO is the most actively traded options market in Taiwan, but almost have no stock options trading volume due to the release of warrants market. However warrants market and individual stock options have higher homogeneous and better mobility to influence the stock options market. Although Taiwan options market started late, develops quite fast. The option of Taiwan index is the sixth volume in the global select token name in 2013, shows that Taiwan index options is a good target on the options-related research.

Due to the globalization of financial markets, the single original market wave turn into the global storm which that affects financial asset prices are no longer continuous fluctuations, and shows a leaps of change by the Butterfly Effect. The Spread and Jump Process by Metorn (1976) assume the process that the prices of assets in line with the modified Compound Passion to revise price may occur discontinuities. Because the price process includes continuity and discontinuity, the spread and jump process is more accurate than Brownian motion (BM). After Heath, Jarrow, and Morton (HJM, 1992) compared to basis points.

Currently the derivatives study biased on interest rate futures, foreign futures or foreign exchange futures options and Taiwan index futures options. By the way, the study about the jumping risks related to Taiwan index options effects is rare.

This research focuses on the domestic Taiwan Stock Exchange Weighted Index (TAIEX) Option for the object; using regression model analysis to explore the influence on market reaction by jumping risk agent variable. According to this background and motivation, the purpose of this study is to discuss that when Taiwan weighted index options (TXO) which is target assets occurs jumping risk, the influence of option price and the rate of return and exploring the influence of option on price and return rate when volatility risk of TAIEX increases.

2 Literature Reviews

2.1 Section I Taiwan Index Option

2.1.1 The Evolution of Index Options

Index options were first launched by the Chicago Board Options Exchange (CBOE) on March 11, 1983. Originally, index options trading as a name of CBOE 100 which is an American-style index options on the market; the index of CBOE 100 selected and calculated 100 type of stock price which have stock options at CBOE. Later, the Chicago Board Options Exchange change name as S&P100, which is trading S&P100 stock index options currently. S&P100 stock index options is a first trading stock index options, and the code of market trading is OEX. Moreover, CBOE launched S&P500 index options on July 3. At the beginning, S&P500 stock index options trading as American style, but change style to European options in April 1986.

On December 16, 2001, Taiwan Futures Exchange launched Taiwan stock index options which is the first option on the open market in Taiwan, then lunched stock options On January 20, 2003. Moreover, TFE launched the MSCI index of dollar-denominated options on March 27, 2006. October 8, 2007 cabinet choices and the non-payment of electricity options listed. On January 19, 2009, TFE launched the NT dollar-denominated gold options which are the Taiwan first product options.

2.1.2 Comparison of Stock Index Options and Stock options

Stock index option is cash settlement when contracted, the seller delivers the embedded value of option at due date (difference between the index and the contract index) without delivery of stock. Instead, stock options are stock delivery mostly. Generally, stock indexes do not have the trouble of exclude right (XR) and exclude dividend (XD), stock index containing a lot of stock and proportion of stocks is limited. Therefore, the influence of exclude right and exclude dividend on a single unit stock is lesser. The target asset of stock index options is stock, and the target asset of stock options is stock. Comparing with stock, stoke index does not trading generally; therefore, the operation of index options arbitrage is weaker than the operation of stock options. Index cannot be trade, so if the price of index options violates an equivalent theory or limit of call option and put option, or B-S evaluation of the formula; the power of arbitrage cannot be fully used. Therefore, the market price and the theoretical values of price difference will still exist; and this price difference will be powerful than stock options.

2.1.3 Study of Domestic Stock Index Options

In domestic relative research papers, most of options concentrated on trading strategies, such as Weiren Zeng (2007) the results shows in the option opened monthly sold out option across parts which is higher than 600 points of price even as high as 20.02% annual rate; moreover, the sample period from January 2002 to October 2007. Practical analysis of its time, Taiwan stock index changes from 4,000 lowest points up to 10000 points nearly before Subprime crisis 2008. Therefore, across-parts which are higher than the price even would have a better profit. Qingji Chen (2009) explore that trading different price level of Taiwan index in sample period will get profit; in other words, using constantly adjustments to earn the time value of choosing right. Mengxuan Zhou (2006) study the 24 types of trading strategies that Taiwan index options used in a total five-year sample period from January 2002 to December 2005. Minghong Chen (2005) using Strangle Strategy which as price-even for benchmark that sold out by 200~800 points; and the Taiwan Index Choosing Right which distance due day just a months. From January 2003 to December 2005, Strangle Strategy cannot have effective profit no matter sold out by 200 points or even 800 points. But if using stop-loss strategy and reverse sold strategy after sold out will improve profit strategy.

2.2 Influence of Financial Derivatives Jumping Risk

2.2.1 Model Design

Hamilton (1989) discussed Markov Switching Model, using Markov chain to describe the transition conditions in different economic boom. However, consider that stock will have abnormal change by the influence of unexpected incident. So emerge Regime-Switching model with jumping risk; one is a jump process that apart from state, another is a jump process with state-dependent. YuXiu Xu (2009) apply international index to Regime-Switching model with jumping risks, based on Expectation-Maximization algorithm and the Gibbs sampling for parameter estimation and used Supplemented EM algorithm to estimate parameters of variance.

In order to improve the empirical phenomenon of the Black-Scholes model, Shigui Lin (2004) using

Markov jump-diffusion process on other models that are suggested having leptokurtic characteristics and gathered fluctuation phenomena prove not only can consolidate leptokurtic and fluctuation smile characteristics but also can produce phenomena that gathered fluctuation with long memories.

In the HJM framework, Lizhen Chen (2009) using simple regression to set the implied volatility functions (IVF), trying to figure out the best way to describe the model of implied volatility. Refer to Peña et al.(1999) consider about the implied volatility function of general symmetric and asymmetric, to capture the possible trends of smile curve. Eventually, using HJM model and ad hoc methods to evaluate the Eurodollar futures options; moreover, using sample assessment methods to compare the evaluation performance of HJM model and ad hoc methods. The result shows that the derivative Pe ñ a et al. (1999) of the regression functions, the explanation effectiveness of variable effect model is obviously. The explanation effectiveness performance of symmetry implied volatility is better than asymmetric implied volatility model. The evaluation shows that fixed volatility model in the HJM model is most stable and the evaluation result of HJM model and ad hoc method is inconsistent before comparing with variable effect. In HJM model, taking into account the effect of curvature and the due date will have a better evaluation of performance, and in the ad hoc methods consider the linear effect makes a good evaluation of performance. Compared with the evaluate performance of samples, found HJM model stability evaluation is higher than method evaluation.

2.3 The volatility analysis of derivative financial commodity

2.3.1 Volatility Analysis

Whaley (2009) by selecting the right exhibition of VIX (Volatility Index) also known as investor panic pointer (Investor fear gauge), which reflects investor expectations of 30-day volatility of future stock price.Xing et al. (2010) study the smile curve of United States stock option (Volatility Smirk) has ability to predict stocks. This Volatility Smirk is defined as the exclusive right to sell (0.8< strike price/price <0.95) implied volatility, less price-buy (price 0.95< price/performance <1.05) implied volatility. Results show the future stock prices of high Volatility Smirk will fall, low Volatility Smirk will rise, using multiple regression, as well as a wide range of control variables statistically significant; Moreover, point out the Volatility Smirk in illiquid and options when Delta high prediction ability, pointed out that Volatility Smirk predicted surplus of shares is not expected to change the subject matter have predictive ability. Cremers and Weinbaum (2010) explore the deviations of Put-call parity can be used to predict future stock price movements. Volatility Spread has strong predicted ability when the liquidity of target stock is poor, and the liquidity of options itself is better. Xing et al. (2010) proves the conclusion of this article once again.

In the empirical study of Ang et al. (2006) found that high risk stocks have lower rates of remuneration. Because this behavior violates the expectation of high risk and high reward, is defined as "low volatility anomaly ". In Lv Ruixuan (2013) research which investigate the effects of investor sentiment for the low volatility anomaly. The results show that (1) After adjust the risk of factors still exist the low volatility effect. (2)By adding investor sentiment as a risk factor, investor sentiment has positive effects on low volatility forecasts. (3) Only under the period of economic expansion, investor sentiment can positive predict the effects of low volatility; while in the recession period, did not find evidence of investor emotions can predict the effects of low volatility. In addition, taking into account the volatility clustering and grouped samples too small (volatility clustering) question, by changing the portfolios of the way to test these results are robust, empirical results show that the results were the same after the change the way portfolio construction.

3 Methodology

3.1 Research Framework

This study investigated the effects of jumping risk on abnormal returns; using regression to explore the effects of regression and information content, as shown in Figure 3-1.

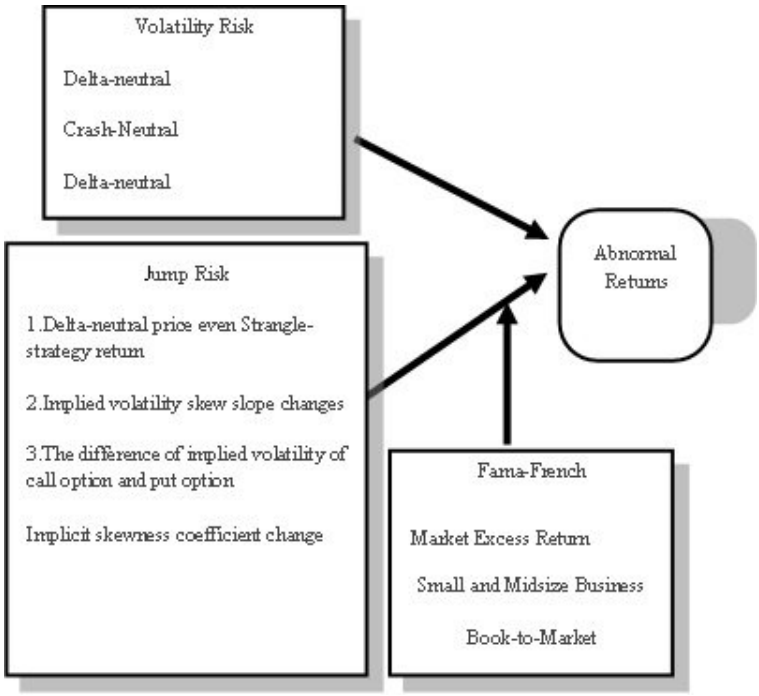

Figure 3-1 Research Framework of Risk Reaction Influence on Market

3.2 Research Method

3.2.1 Research Method

This study using assets pricing model that proposed by Ang, Chen and Xing (2006) to consider relative data and return factors that affect stock, found investors disagree that the loss risk more than profit. Individual stock which holds paid and high crash sensitivity of major market will require risk premium to control pricing factors such as company's market value, scale factor, liquidity risk and so on; found individual expected paid can reflect 6% years paid rate of risk premium. The control factors from empirical research by Fama and MacBeth (1973), confirmed that the obviously positive relationship between stock return and β,supports the theory of CAPM. Fama and French made "β values are irrelevant to long term average rewards of stock", which means the appropriateness of the capital asset pricing model, began to be addressed.

Fama and French (1992) explore the relationship between cross sectionβvalue, company scale, price-to-sales ratio, benefit- cost ratio, leverage level (A/ME, A/BE) and average return on non-financial company stock. Considering that company scale and price-to-sales ratio catch the variation of rate of return effectively and company scale and paid rate is negative relationship; book market and paid rate is positive relationship, and the paid rate of value type stock (high BE/ME) is higher than growth type stock (Low BE/ME). And book market ratio can replace the explanation ability of benefit ratio and leverage degree on the average rate of return; therefore, value stocks take on a greater financial risk, and investors require higher return ration of this kind of stock. Because the benefit- cost ratio and leverage level can replaced by price-to-sales ratio on the explanation ability of average return on stock; therefore, value stocks take on a greater financial risk, and investors require higher return ration of this kind of stock.

During 30 years (1963-1990), Fama and French (1993) using common stock of non-financial company as a research object including NYSE, AMEX and the NASDAQ, found there are no obviously relationship betweenβvalue and average rate of return on stock; no matterβvalue itself or combine with other variable, the statistics volume by Fama-MacBeth method are not significantly. However, found company scale (SMB) and price-to-sales ratio (HML) have significantly effect on stock average paid ratio, and market factor (market excess return) also has strong explanation ability. To sum up, that general risk factor (common risk factors) such as market factor, company scale and book market can effective find out risk premium which derivative out from non-system risk, and this is so called Fama-French three factor model.

Jagannathan and Wang (1996) consider that generally ignored the CAPM theory during the study of CAPM is static, assuming that investors ' behavior is a period, this Beta values are constant throughout the period, and the behavior of investor is a period in reality. Therefore Beta values are affected by market circle fluctuations. CAPM assumes all rewards in the stock market to replace the aggregate wealth pay of society; however, there is other which not covered. Jagannathan and Wang (1996) consider that measuring Beta market indexes have to combine human resource, forming conditional CAPM (conditional CAPM). The results show scale affect and net market value have no explanatory power on stock return. Combining past research data, this study used Fama-MacBeth two-phase multiple regression methods, using factor analysis on first stage to identify factors which influencing the reward factor, and then substituted into the regression model on second stage.

Using multiple regression model, Dimson (1979) combined one or two period of decline and advance market to explain returns of single stock, and the sum of each coefficient. The main reason is that the Beta coefficient comes from historical data which using day-record mostly and using closing price to calculate stock price and rate of return on stock. At that time, there may be market index but not necessary to have closing price for single stock; and period that on record is unequal because the real

trading record may happened earlier. Therefore, using this data to estimateβvalue with least squares, will cause error problem in variable. So using Dimson (1979) proposed that estimate each period of Beta with current and last period of stock ratio, and then adds up those Beta coefficients to estimate the Beta coefficients of total market risk.

$$AR_{i,t} = \beta_{i,0} + \beta_{i,MP_t} \cdot MP_t + \beta_{i,MP_{t-1}} \cdot MP_{t-1} + \beta_{i,JR_t} \cdot JR_t + \beta_{i,JR_{t-1}} \cdot JR_{t-1} + \varepsilon_{i,t}$$

$JR_t =$ Jump risk

Chang, Christoffersen and Jacobs (2009) using that based on the market skewed to consider the data option, and the market price is a negative. The reasons that jump risk inconsistent with economic instincts that under the consideration of market skewed are that the market price of jump risk is positive. The implied expected return and systematic risk has been calculated and analyzing the results rationality and forecast ability for future. The research of Bakshi, Kapadia and Madan (2003) explored deeply about implied skewness coefficient and the influence of kurtosis coefficients on volatility smile curve curvature effects. Based on jump risk, this research considers Bakshi, Kapadia and Madan (2003) proposed the implied skewness coefficient variation as a proxy variable (BKM).

3.2.2 Data Setting

To receive the results of Zero-Bata by Coval and Shumway (2001), Delta-neutral trading strategy must be used; therefore, it must be assumed that the trading number of choosing right can be infinitely divided. We hope through the Taiwan weighted index options (TXO) for the transaction object, build a buying across the site. Buy in due date within 28 days of the price level for investment in cross-site. For example, if there is a document on June 16, 2015 the market maturity of June 15 day option, you use the June 16 closing price bought by Delta-neutral add up to a price level strategy. Using the same conditional sale and purchase the right characteristics of Delta-phase is equal to one, in order to get Delta-neutral buys right to buy weights for the right to sell the absolute value of the Delta, Delta to buy weights for the right to buy the right to sell. Using Delta-neutral to avoid the forecast of policy on index change, achieve the Zero-Bata effect.

Table 3-1 Taiwan weighted indexed option transaction data on June 2015.

Due Month	Strike Price	Call Delta	Put Delta
201506	8950	0.963	-0.037
201506	9050	0.852	-0.148
201506	9150	0.635	-0.365
201506	9250	0.365	-0.635
201506	9350	0.148	-0.852
201506	9450	0.037	-0.963

Using a month option in June 16, 2015 as an example can be seen that the Taiwan index option call Delta and put Delta of 9150 or 9250 strike price are closest modulus. According to the characteristic of three options strike price of choosing right, 9150 is closest to the price level. Therefore we will have long call 0.365 and long put 0.635 to building trading strategies based on previous experiment design.

3.3 Data Source and Principles of Sample Selection

3.3.1 Samples during Study

This study investigated the jump risk, during study cover the financial markets from January 2, 2002 to December 31, 2014 that including 2002 SARS, 2007 high oil prices, 2008 United States subprime storm, and 2011 the European debt crisis.

3.3.2 Data Source

This study discess the change of Taiwan index options prices and return ratio; also, prove the Taiwan index changes of target asset and domestic and foreign economic changes, following two types are the data source:

(1) Taiwan Futures Exchange Web site: futures settlement price monthly.

(2) Taiwan Economic News Database: the option data, stock indexes, and trading volume of derivatives. For example, per capita income, the interest rate and so on.

Taiwan economic news only got the closing database of option, each trading transactions are assumed to be closed at the moment. Taiwan Futures Exchange closed from 1:45 P.M., therefore all trading assumptions are sold at 1:45.

The table 3-2 shows that the trading volume of option right from 2005 is become stably, because of simple cross-site only used near the price level to the nearest option, sample period refers to the right to choose by Taiwan officially in TFE from January 2002 to December 2014.

Table 3-2 Annual Trading Volume of TAIEX options

Year	Trading volume	Days	Average volume/day
2001	5,137	6	856
2002	1,566,446	248	6,316
2003	21,720,083	249	87,229
2004	43,824,511	250	175,298
2005	80,096,506	247	324,277
2006	96,929,940	248	390,847
2007	92,585,637	247	374,841
2008	92,757,254	249	372,519
2009	72,082,548	251	287,181
2010	95,666,916	251	381,143
2011	125,767,624	247	509,181
2012	108,458,103	250	433,832
2013	109,311,515	246	444,356
2014	151,620,546	248	611,373

4 Empirical Results

4.1 Study I

By using multiple regression models of Fama and MacBeth(1973) to measure the overall jump risk. Overall risk factor proxy variables: DNS means Delta-neutral price levels across policy rewards, ΔIV means implied volatility skew slope changes, and the differences between OTM95 put out the money, and call at the money; moreover, ΔBKM means Bakshi et al. (2003) proposed implicit skewness coefficient change. Using method of estimation by Newey-West (1987) to fix the collinearity of independent variable, which caused by regression analysis of time series; violated independence assumptions, and self-related errors term.

$$AR_{i,t} = \beta_{i,0} + \beta_{i,DNS_t} \cdot DNS_t + +\beta_{i,\Delta IV_t} \cdot \Delta IV_t + \beta_{i,OTM95_t} \cdot OTM95_t + \beta_{i,\Delta BKM_t} \cdot \Delta BKM_t + \varepsilon_{i,t}$$

$$AR_{i,t} = \beta_{i,0} + \beta_{i,DNS_t} \cdot DNS_t + +\beta_{i,\Delta IV_t} \cdot \Delta IV_t + \beta_{i,OTM95_t} \cdot OTM95_t + \beta_{i,\Delta BKM_t} \cdot \Delta BKM_t + \beta_{i,MP_t} \cdot MP_t + \varepsilon_{i,t}$$

$$AR_{i,t} = \beta_{i,0} + \beta_{i,DNS_t} \cdot DNS_t + +\beta_{i,\Delta IV_t} \cdot \Delta IV_t + \beta_{i,OTM95_t} \cdot OTM95_t + \beta_{i,\Delta BKM_t} \cdot \Delta BKM_t + \beta_{i,MP_t} \cdot MP_t + \beta_{i,HMLN_t} \cdot HML_t + \beta_{i,SMB_t} \cdot SMB_t + \varepsilon_{i,t}$$

Due to the adoption of multiple regression model analysis, analyze it's explanatory power before analyze the results of variable; therefore using adjusted R2 values to determine the explanatory power of independent variable(market risk premium, the three-factor of Fama and French (1993)) to dependent variable.

Table 4-1 shows the explanatory power of the model followed by 2.1%, 21.8%, 29.3%, and the F value shows the explanatory power of three regression model is significant and having statistics meaning; moreover, combine with risk premium of market factor will increase the explanatory power of abnormal returns.

Four proxy variables were negatively correlated with abnormal returns in the analysis of company jump risk factor. And this result is consistent with total risk model, because risk-avoided investors using option market and stock market as a hedging tool. Fama and French (1993) show three-factor, bringing the total jumping risks increase and significant increases, among them, the implied volatility skew slope changes (IV) is the most obvious and a greater impact than the other three jumps risk proxy variables.

In summary, those factors affect the abnormal returns including Fama and French (1993) three-factor, return strategy of Delta-neutral strangle at the money, implied volatility skew slope and the difference of implied volatility of put out of the money; moreover, the implied skewness coefficient variation that proposed by Bakshi et al. (2003).

Table 4-1 Total Jump Risk Premium

Variable	AR i, t	AR i, t	AR i, t
β0	3.688 (1.673)∗	2.344 (1.694)∗	1.982 (1.685)∗
DNS i, t	-0.325 (-1.655)∗	-0.267 (-1.236)	-0.433 (-2.261) ∗∗
ΔIV i, t	-0.587 (-2.035) ∗∗	-0.625 (-2.734) ∗∗	-0.610 (-2.653) ∗∗
OTM95 i, t	-0.354 (-1.875)∗	-0.220 (-3.239) ∗∗	-0.061 (-1.161)
ΔBKM i, t	-0.345 (-0.895)	-0.026 (-2.293) ∗∗	-0.561 (-2.161) ∗∗
MP i, t		0.237 (2.193)∗∗	0.621 (3.153) ∗∗
HML i, t			0.241 (2.431) ∗∗
SMB i, t			0.251 (1.731) ∗
Adj R2(%)	3.6	25.1	39.1
F value	2.622∗	20.634∗∗∗	26.257∗∗∗

PS. 1. ( ) means t value

2.* 10% Significant Levels, ** 5% Significant Level, *** 1% Significant Level.

The result shows that when the average Beta values of Delta-neutral-price level across the policy paid (DNS) is -0.0446 and it's standard deviation of Beta values is -0.0326, combining regression analysis to estimates the market risk premium (price volatility) is -0.433. The result estimates that beneath the two standard deviations, Delta-neutral return strategy decreased the return rate of 2.823% annual ($-0.433\times 2\times 0.0326=-0.02823$)。

The average Beta value of implied volatility skew slope change (IV) is -0.1367, and the standard deviation is 0.0721; combining regression analysis to estimates the market risk premium (price volatility) is -0.610 which shows that implied volatility skew slope change expected to bring down the return rate of 8.796% beneath the two standard deviations per year. The average Beta value of implied volatility difference (OTM95) between put out the money (exercise price and spot price is 0.95) and call at the money is 0.0612, and the standard deviation is 0.0417. Combining regression analysis to estimates the market risk premium (price volatility) is -0.061 which shows that the implied volatility skew slope change of put out the money (exercise price and spot price is 0.95)and call at the money are expected to bring down the return rate of 0.509% ($-0.061\times 2\times 0.0417=-0.00509$) beneath the two standard deviations per year. The average Beta value of implicit skewness change(△BKM) is -0.0095, and the standard deviation is 0.0154; combining regression analysis to estimates the market risk premium (price volatility) is -0.561 which shows that implicit skewness change expected to bring down the return rate of 1.728%($-0.561\times 2\times 0.0154=-0.01728$) beneath the two standard deviations per year.

Table 4-2 The Average Value and Standard Deviation of Overall Jump Risk Premium

Variables	Average Value	Standard Deviation
DNS i, t	-0.0446	0.0326
△IV i, t	-0.1367	0.0721
OTM95 i, t	0.0612	0.0417
△BKM i, t	-0.0095	0.0154

4.2 Study II

By using multiple regression models of Fama and MacBeth(1973) to measure the total volatility risk. Overall risk factor proxy variables: DN means Delta-neutral price levels across policy rewards, CNDN strategy for Crash-Neutral and Delta-neutral under the price level for panic across policy rewards, and△VIX means fear index variation. In order to fix in time series regression analysis may lead to arguments among collinearity, violating independence assumptions, and errors might be self-relative, so use estimation of Newey-West (1987).

$$AR_{i,t}=\beta_{i,0}+\beta_{i,DN_t}\cdot DN_t+\beta_{i,CNDN_t}\cdot CNDN_t+\beta_{i,\Delta VIX_t}\cdot \Delta VIX_t+\varepsilon_{i,t}$$

$$AR_{i,t}=\beta_{i,0}+\beta_{i,MP_t}\cdot MP_t+\beta_{i,DN_t}\cdot DN_t+\beta_{i,CNDN_t}\cdot CNDN_t+\beta_{i,\Delta VIX_t}\cdot \Delta VIX_t+\varepsilon_{i,t}$$

$$AR_{i,t}=\beta_{i,0}+\beta_{i,MP_t}\cdot MP_t+\beta_{i,DN_t}\cdot DN_t+\beta_{i,CNDN_t}\cdot CNDN_t+\beta_{i,\Delta VIX_t}\cdot \Delta VIX_t+\beta_{i,HMLN_1}\cdot HML_t+\beta_{i,SMB_t}\cdot SMB_t+\varepsilon_{i,t}$$

Owing to use multiple regression analysis before analyze the results of variable, therefore, adjusted R2 values to judge the explanatory power of independent variables to the model of the dependent variables. Table 4-1 the explanatory power of the model followed by 2.1%, 21.8%, 29.3%, through a F values of significant integral testing of the model shows that three regression models has significant explanatory power, which include a market risk premium to the explanatory power of abnormal returns improve.

In company's overall risk factor analysis, knows that three proxy variables were negatively correlated with abnormal returns, this conclusion consistent with the research results of Ang et al. (2006), Bakshi, Cao and Chen (2000), Pan (2002), Eraker, Johannes and Polson (2003) and Lv Ruixuan (2013). The possible reason may be that investors using option market and stock market as a tool which can avoid risk, so abnormal returns decline when volatility risk increases. Overall volatility risk has less influence on abnormal returns before adding the control variables. However, overall volatility risk has significant affect when adding the market risk premium or three-factor of Fama and French (1993), among them; the fear index (VIX) is the most obvious and a greater impact than the rest of the two volatility risk proxy variables.

o sum up, the three-factor of Fama and French (1993), Delta-neutral price levels across police pay, Crash-Neutral and Delta-neutral price levels across policy rewards will influence the abnormal returns and the change of fear index.

Table 4-3 Overall Volatility Risk Premium

Variables	$AR_{i,t}$	$AR_{i,t}$	$AR_{i,t}$
β_0	3.788 (3.463)***	0.464 (2.294)**	1.396 (2.085)*
$DN_{i,t}$	-0.135 (-0.563)	-0.175 (-1.373)	-0.463 (-2.316)**
$CNDN_{i,t}$	-0.487 (-0.871)	-0.414 (-2.647) **	-0.310 (-2.153) *
$\Delta VIX_{i,t}$	-1.042 (-0.875)	-1.020 (-4.293)***	-1.061 (-4.161)***
$MP_{i,t}$		0.130 (2.293)**	0.321 (3.231)***
$HML_{i,t}$			0.226 (2.331)**
$SMB_{i,t}$			0.321 (1.231)
Adj R^2(%)	2.1	21.8	29.3
F value	2.617*	19.731***	20.073***

PS. 1. ( ) means t value

2.* 10% Significant Levels, ** 5% Significant Level, *** 1% Significant Level.

By the tables 4-3 and 4-4, knows that when the average Beta values and standard deviation of Delta-neutral-price level across the policy paid (DN) is -0.0057 and 0.0843, combining regression analysis to estimates the market risk premium (price volatility) is -0.463. The result shows that beneath the two standard deviations, Delta-neutral paid price levels across a strategy expected to bring down the rate of 7.806% per year. The average beta values and standard deviation of Crash-Neutral and Delta-neutral price levels across policy rewards (CNDN) is -0.0103 and 0.1022, combining the risk premium (price volatility) of regression estimates market is -0.310, shows that under the two standard deviations, Crash-Neutral and the Delta-neutral-price level across the policy rewards are expected to bring down the rate of 6.336% per year. The average beta values of fear index (ΔVIX) is 0.0012 and the standard deviation is 0.0061. Combining the risk premium (price volatility) of regression estimates market is -1.061, shows that under the two standard deviations, fear change in the indices are expected to bring down the rate of 1.294% per year.

Table 4-4 The Average Value and Standard Deviation of Overall Volatility Risk Premium

Variables	Average Value	Standard Deviation
DN i, t	-0.0057	0.0843
CNDN i, t	-0.0103	0.1022
ΔVIX i, t	0.0012	0.0061

5 Conclusions and Suggestions

The study proposed is to measure the pricing of Taiwan index option jump risk, using cross-sectional data on a 12-month study period, and using the iteration method to study effects on abnormal returns; moreover, the result shows that different factors of jump risk occurs same effect. However, in traditional financial theories consider that high risk should have high returned which is in contrast to the result of this study. In behavioral finance of modern financial theory, investors didn't act rationally and have no specific trading behavior; moreover, the financial market is ineffective. Therefore high risk produced instead of low paid. Furthermore this study is to measure the pricing of Taiwan index option volatility risk, use cross-sectional data on a 12-month study period, and using the iteration method to study effects on abnormal returns. A result shows that different volatility risk factor has significantly effect on abnormal returns, and will cause risk premium. But traditional financial theories consider that high risk should have high returned which in contrast to the result of this study. The main reason is that investors in the behavior financial learn of modern financial theory is not rational, non-random trading behavior and non-efficiency financial markets; so high risk instead produced low paid.

The suggestions for future research direction, due to different group investors by preference industry category (electronic, financial, biography produced, and health technical medical), investment type (value type or growth type), and standard of assets scale different (high unit or low price unit); the trading volume of each stock option so far is low in domestic, and lack of research data, so wait to trading volume upgrade in the future can classify, analysis and increased different kind of data connotation. According to the prospect theory the proposed by Shleifer and Vishny (1997) as a decided model which used when people face the unsure situation. When investors under the situation that corresponding profit and loss, the marginal loss are sensitive than marginal profits. When profit is diminishing, investor risk aversion tendency; instead, increasing losses for utility, investor risk appetite. If loss of a unit marginal pain greater than getting a unit profit margins, people have a tendency to loss aversion. Later can explore about over the earnings risk and lower the risk of loss. In behavioral finance theory, disposition effect means when investment

goods benefit a lot investors appearance; and framing effect refers to the use of different ways (framework) to describe the same problem, you can let the same person made a different decision. These will increase the explanatory power of the model.

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