



# Event Study of Exchange Listing: An Application of Stochastic Coefficient Regression Model

## 中文摘要

本研究利用事件研究法探討國內上櫃公司轉為上市公司交易後，其異常報酬與流動性的變化情形。我們利用 Fama, Fisher, Jensen, and Roll (1969) 的事件研究法計算異常報酬。此外，我們透過文獻上常用的數個流動性指標來衡量各公司在轉上市後流動性的變化情形。這些流動性指標包括 Elyasiani, Hauser, and Lauterbach (2000) 的買賣價差替代指標、Amivest 流動性指標、市場模型殘差變異數以及 Tkac (1999) 所提出的異常流動性指標。值得一提的是，本文的主要貢獻之一就是利用 Tkac (1999) 的異常流動性指標來評估上櫃公司轉上市事件的流動性變化程度，這是該指標第一次被應用於此領域。根據本研究結果發現，平均而言，上櫃公司在轉上市前後的異常報酬率皆為負值，此結果與文獻的發現有些不同。一般而言，文獻發現上櫃公司在正式宣告申請轉上市後，股價會呈現正面的反應而出現正的異常報酬，但於正式上市交易後，股價便呈現相對於市場疲軟的走勢而導致負的異常報酬。因此，總而言之，現有的文獻不認為上櫃公司可以透過轉上市交易的方法來增加其公司的整體市場價值。雖然和文獻一致，本文發現上櫃公司的轉上市後股票的異常報酬率是負的，但是轉上市前的結果卻與文獻的發縣大相逕庭。這個結果顯示：國內的投資人並不認為上櫃公司可透過轉上市交易的方法獲得任何好處。至於流動性的變化方面，雖然不同的指標呈現出些微不同的結果，但整體而言，上櫃公司在轉上市後股票的流動性並未獲得明顯的改善，此結果亦和文獻的發現相異。因此，我們認為上市市場並未提供足夠的誘因促使上櫃公司申請改變其交易場所。

關鍵詞：上櫃轉上市事件研究、異常報酬、異常流動性

## **Abstract**

We employ the event study methodology of Fama, Fisher, Jensen, and Roll (1969) to examine the behaviour of abnormal returns and abnormal liquidity after a firm whose stock is traded in the over-the-counter market switch its trading venue to an exchange market in Taiwan. The abnormal returns are calculated according to the market model. The abnormal liquidity is measured based on several commonly used liquidity measures including the proxy of spread of Elyasiani, Hauser, and Lauterbach (2000), Amivest liquidity measure, the variance of the residual of market model, and the abnormal turnover ratio proposed by Tkac (1999). We would like to stress that the abnormal turnover ratio has never been used to examine the liquidity effect of exchange switching event before. This is one of main contributions of this study. Our result shows that the abnormal returns are negative both before and after the announcement of exchange listing. Although the negative abnormal returns after exchange listing are consistent with the findings in the literature, those before exchange listing are different from what have been found in the literature. It implies that investors in Taiwan do not consider changing trading venue as a means of market value creation for over-the-counter firms. Regarding the behaviour of abnormal liquidity for exchange listing, we find that the liquidity improvement resulting from the event is generally disappointing although different liquidity measures reveal somewhat different results. This result is inconsistent with the liquidity gain hypothesis of exchange listing supported by the literature. Overall, the exchange market in Taiwan does not provide enough incentives for over-the-counter firms to change their trading venue from the OTC market to the exchange market.

Keywords: event study of exchange listing, abnormal returns, abnormal liquidity

## Introduction and Empirical Results

In the literature of event study of exchange listing of stocks previously traded in the over-the-counter market, three common phenomena have been documented including the significant positive abnormal returns prior to the announcement date, the significant negative abnormal returns after the listing date, and the improvement of liquidity. Several explanations for the significant positive abnormal return and the improvement of liquidity have been proposed while the significant negative abnormal return still remains as a puzzle. Sanger and McConell(1986) propose two explanations for the significant positive abnormal stock returns before the announcement of listing. First, firms may decide to apply for exchange listing after experiencing a period of strong performance. Second, the abnormal returns may result from information leakage through insider trading in advance of the public announcement. Another possible explanation is from the literature of market microstructure that there exists a liquidity premium in capital markets, e.g., Amihud and Mendelson(1988) and Brennan, Chordia, and Subrahmanyam(1998). In other words, the significant positive abnormal stock returns may arise from the expected improvement of liquidity after the exchange listing. However, Barclay, Kandel, and Marx(1998) do not find evidence which supports this line of argument. In contrast, Elyasiani, Hauser, and Lauterbach(2000) do discover a significant relation between the abnormal stock return and two different kinds of liquidity measures. In addition, Clarkson and Thompson(1990) suggest that the expected reduction of estimation risk resulting from the exchange listing may cause the significant positive abnormal returns. As for the improved liquidity after listing, Barclay, Kandel, and Marx(1998) provide an explanation that the lower transaction cost in the exchange results in higher liquidity for individual stocks. We argue that the evidence on the significant positive abnormal returns and the improved liquidity should be reexamined within a more general framework before distinguishing between the aforementioned possible explanations. The framework we suggest can also shed some light on drawing a distinction between different explanations.

According to the event-study methodology suggested by Fama, Fisher, Jensen, and Roll(1969), abnormal return(AR) and cumulative abnormal return(CAR) are usually used to gauge the information content of firm-specific events. The abnormal return is commonly measured relative to the market model. The market model has a unrealistic presumption that beta of individual stocks is stationary during the predefined event period. Whether the beta is stationary may have important influence on the magnitude of the abnormal returns reported in the previous event studies of exchange listing. Grammatikos and Papaioannou(1986) and Bhandari, Grammatikos, Makhija, and Papaioannou(1989) have noted the possibility that risk characteristics of the security may change because of listing. In fact, Bhandari, Grammatikos, Makhija, and Papaioannou(1989) document that riskiness is found to be greater immediately after listing than in later periods. In other words, the beta of securities actually increases after listing. To take the possible non-stationarity of beta into account, we decide to adopt

the more general framework of event study suggested by De Jong, Kemna, and Kloek(1992) to calculate the abnormal stock returns during the period of event. This framework is based on Rosenberg's(1973) "return to normalcy" model in which the beta of individual stocks follows an AR(1). It also considers the autocorrelation and heteroskedasticity of daily data. The Kalman filter technique is used to estimate the model. Apart from the estimated model parameters, we also have a complete time path of betas during the event period as a by-product of Kalman filter estimation. From the time path of beta, we are able to see whether beta actually decreases after listing as suggested by the hypothesis of estimation risk. Therefore, the first contribution of our paper is to reexamine the previous reported abnormal return within a more general framework and indirectly test the estimation risk hypothesis.

The liquidity of the stocks that apply for exchange listing is found to increase a great deal after listing. Elyasiani, Hauser, and Lauterbach(2000) use five different measures as proxies for liquidity and report significant liquidity improvement no matter which measure of liquidity is used. Barclay, Kandel, and Marx(1998) discover similar liquidity increase after listing although they use trading volume as a proxy for liquidity. Christie and Huang(1994) present similar evidence using transaction data. We argue that these measures all fail to disentangle the market-wide liquidity from the unique liquidity that solely belongs to individual stocks. Failure to segregate the market and unique components of liquidity measure may mistakenly attribute the liquidity improvement to exchange listing. This is because the observed improvement may probably come from the market-wide liquidity improvement rather than from the unique liquidity that we aim to gauge. Hence, it is very important to filter out the market-wide liquidity and use the unique liquidity in the event study of exchange listing. We use the equilibrium liquidity model of Tkac(1999) to accomplish this task. The proxy of liquidity we adopt is the share turnover as suggested by Lo and Wang(2000). Since the model of Tkac is very similar to the market model, we also extend it within the stochastic coefficient regression model alike to that proposed by De Jong, Kemna, and Kloek(1992). In other words, we assume the sensitivity of the liquidity of individual stock to the market-wide liquidity to follow an AR(1) model. Because the unique liquidity is frequently used to quantify how much information incorporated into trades, we can test the information leakage hypothesis of positive abnormal return based on the behavior of the unique liquidity. This is another contribution of our paper. Through the more general procedures discussed above, we expect to provide some insights into the behavior and further the possible causes of the abnormal stock returns and abnormal liquidity of the event study of exchange listing.

Our result shows that the abnormal returns are negative both before and after the announcement of exchange listing. Although the negative abnormal returns after exchange listing are consistent with the findings in the literature, those before exchange listing are different from what have been found in the literature. It implies that investors in Taiwan do not consider changing trading venue as a means of market value creation for over-the-counter

firms. Regarding the behaviour of abnormal liquidity for exchange listing, we find that the liquidity improvement resulting from the event is generally disappointing although different liquidity measures reveal somewhat different results. This result is inconsistent with the liquidity gain hypothesis of exchange listing supported by the literature. Overall, the exchange market in Taiwan does not provide enough incentives for over-the-counter firms to change their trading venue from the OTC market to the exchange market.

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