ON THE DESIGNING AND FOREIGN EXCHANGE HEDGING ISSUES OF TAIWANESE EUROCONVERTIBLES

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摘　　　要

　　本研究主要是從商品設計角度探討台灣公司發行海外可轉換公司債的動機及其所涉及的外匯風險問題。

　　公司在發行海外可轉換公司債時，必須考量債券與權益兩部分，票面利率可用來衡量債券部份的價值，而執行價格與固定轉換匯率反應的則是權益部分的價值。本研究採 Mishra 與 Naranyanan (1991) 的方法來探討台灣上市公司發行此衍生證券背後的動機。實證結果發現，就代理理論的觀點而言，上市公司並非基於降低代理成本的動機而發行海外可轉換公司債。就公司管理當局的觀點而言，實證結果不支持公司想以較高的價格出售股票，同時，也拒絕降低融資成本的說法。但是，本研究發現，當外幣傾向升值時，公司會傾向賦予這類衍生證券較高權益的成份。基於此發現，可能的解釋是，海外可轉換公司債的發行公司希望能藉此分散融通的資金來源。

　　最後，關於海外可轉換公司債的發行公司是否要積極管理所面對的外匯風險問題，本研究利用套利定價理論的兩因子模式對發行海外可轉換公司債的二十二家上市公司進行實證。結果發現，由於外匯風險並不被股市投資人評價，就降低資金成本的考慮上，發行公司並不需要對海外可轉換公司債所產生的匯兌風險進行避險。

Abstract

　　This paper is composed of two related topics about the Euroconvertibles: One is to test the rationales behind the issuance of Euroconvertibles. The other is to investigate, based on a viewpoint of their cost of capital, whether the firms should hedge their foreign exchange exposure.

　　For the topic of the design of Euroconvertible, this study examines agency rationale and other managerial rationales behind the issuance of Euroconvertibles. Analysis of empirical results

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shows that the agency rationale cannot be supported, furthermore, the managerial rationale about the position to utilize Euroconvertibles as delayed equity sold at a premium also cannot be supported. As from the point of view of lowering the funding cost, the argument to issue the Euroconvertibles rather than straight debts when the level of interest rate is high is not empirically supported. This study also employs this method to testing how the Euroconvertibles react to the level of foreign exchange rate. It presents that when the level is relatively high; i.e., when the foreign currencies tend to appreciate, the issuers significantly put more weights on the equity component, rather than debt component. It might be explained as the surmise that the firm aimed to diversify its financing sources when designing the Euroconvertibles.

As for the second topic, the empirical results showed that the foreign exchange risk is not priced in the Taiwan stock market. Thus, the issuers of Euroconvertibles need not to hedge against their foreign exchange risk under the considerations of lowering their cost of capital.

I. INTRODUCTION

The primary purpose of this paper is bilateral: To provide an analysis of the design of Taiwanese Euroconvertible bonds on one hand, and then to explore hedging issues for the issuers on the other hand.

Recently, it is common for companies in Taiwan to raise capital by foreign currencies such as Eurodollar, Swiss franc, or Euroyen. Some Taiwanese Euroconvertible issuers have claimed that they have been motivated by cheaper funding cost via the offerings of Euroconvertibles; however, they are doomed to be exposed to foreign exchange risk. The foreign exchange exposure may erode the so-stated cheaper funding cost through annually fixed coupon payments and final repayment of the principal. Thus, what motivations behind the designs of such innovated financing instruments is concerned in this paper.

II. LITERATURE REVIEW

In this section, we will review some literatures on the design of convertibles. Next, we discuss the arbitrage pricing approach to evaluate whether firms should hedge their foreign exchange exposure from the viewpoint of cost of capital.

1. On the Design of Convertible Bonds

In the case of plain vanilla convertible, i.e. except the convertibility into stock, no other embedded options are imposed, value of a convertible bond can be approximately estimated by adding the price of the call option on the stock at conversion price to the straight bond value. Thus, a convertible bond presents duality in its characteristics. When a convertible bond is issued at or very near par, the yield is the coupon rate. Also the conversion price is used as a measure of the equity component. Thus, the main parameters involving the design of such hybrid security should also be dual: the trade-off between the yield and the conversion ratio.

Mishra and Narayanan (1991) (M-N) explored the factors that affect the choice between these two components. Combined with previous studies on the convertible issues, they tested the rationales of issuing convertibles proposed by financial theorists, and those stated in surveys and publications. Their studies showed that the academic rationales, agency theory and asysmmetric information theory, can not be supported. The rationales such as selling the stocks at a premium and saving the interest cost are found to be significantly correlated to the design of a convertible bond.

The empirical studies on Taiwanese convertible bonds, concentrating on the event study, have tried to explain the issuance of such bonds by agency theory, such as Yen and Wu (1995). Lee and Chang (1994) also cope with the issuance of convertibles in terms of agency theory, asymmetric information and cost savings. However, none of them has dealt with the designing issues.

2. Pricing the Exchange Rate Risk

Jorion (1991) proposed that the active hedging policies cannot affect the cost of capital of the US. Firms by examining whether the exchange rate risk gets its way in the stock market using the two-factor model and multiple-factor arbitrage pricing models (APM). It implies that if the exchange rate risk is not priced in an APM sense. Thus, no hedging efforts should be made to lower the cost of capital in the foreign exchange market.

III. ON THE DESIGN OF TAIWANESE EUROCONVERTIBLE

This section will describe the Taiwanese Euroconvertibles market. We will explore the characteristics of some embedded options with these convertibles. This would lead us to be able to study the design of such bonds. Furthermore, we want to investigate the factors that affect the design of Taiwanese Euroconvertible.

1. An Overview to the Taiwanese Euroconvertible Market

Ever since the first Euroconvertible bond was issued by Yuen Foong Yu Paper Manufacturing Co. (YFY) in 1989, under the permission of the ROC Securities and Exchange Commission (SEC) on the issuance of Eurobonds in 1978, there comes along with the explosive growth in the Taiwanese Eurocovertible market. The aggregate proceeds raised annually and over years are summarized in Table 1. Figure 1 are drawn based on these data.

Obviously, for Eurodollars raised, aggregate proceeds of the 1994 new issues account for 77.51% of the overall aggregate proceeds. And 90.07% for Swiss francs raised.

Table 1. New Issues and Aggregate Proceeds over Years

Cumulative Aggregate Proceeds
(Total Issues: 20 issues in Eurodollars; 11 issues in Swiss francs.)

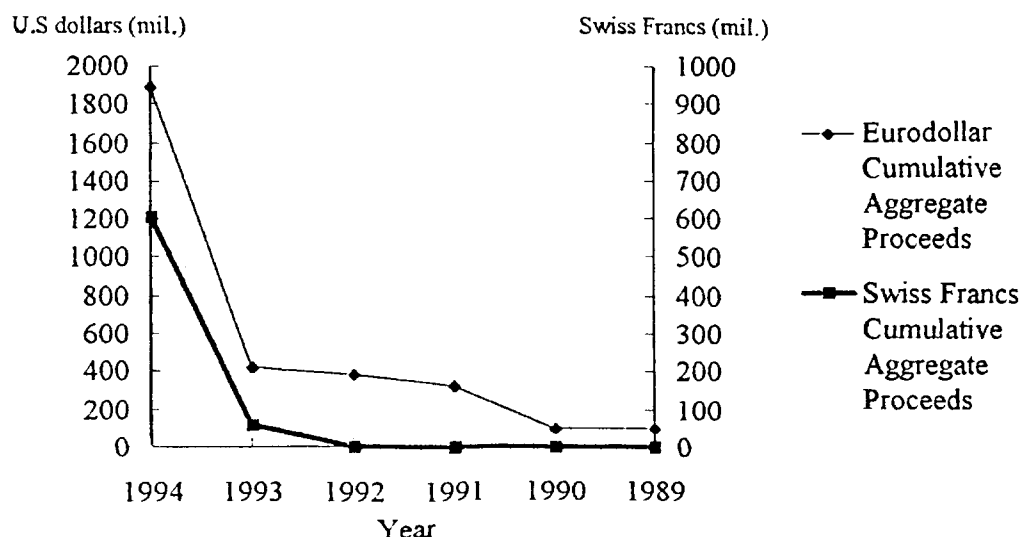| Currency	Year					
	1994	1993	1992	1991	1990	1989
Eurodallar	1890	425	389	329	100	100
Swiss Franc	604.5	60	0	0	0	0 (in millions)

Taiwan's Convertibles Amount Issued

Figure 1. Aggregate Proceeds Raised by Euroconvertibles over Years

2. Market Background

Prior to October 1993, a company raising money in offshore markets had to invest the proceeds of the issue overseas. Once this requirement was lifted by the central bank of ROC; i.e., since then firms could repatriate the proceeds of Euroconvertibles into the New Taiwanese dollars, new issues of raising foreign capital increase rapidly.

The only way for foreign investors to gaining exposure to Taiwan's equity market was to buy closed-end funds investing in Taiwan stocks prior to 1991. Owing to the regulated access to Taiwan's stock market for the foreigners, by the creation of such hybrid security, Euroconvertibles soon caught the eyes of offshore investors who had wished to gain exposure to the Taiwan's stock market. Yet the convertibility of the Taiwanese Euroconvertibles had long been questioned. Most investors still believed that convertibles would become convertible, since the reform-minded SEC had argued for a repeal of such restrictions. As it came out, the investors can convert their Euroconvertibles into GDR (Global Depository Receipts), starting from December 1994. Just after February 1995, the Euroconvertibles can be converted into temporary certificates which can be exchanged for common stocks under certain conditions.

According to the financial statements regarding the issuance of these Euroconvertibles, the issuers use the proceeds from a Eurobond sale for the following reasons: Category 1 Investment: (1) working capital, (2) expansion of facilities, and (3) future acquisition. Category 2 Financing: (1) Refinancing outstanding debt, and (2) effective-cost financing. Category 3 Diversification: (1) international diversification, or (2) gaining international reputation.

From the analysis of Table 2, most of the 27 companies use the proceeds for the purpose of investment (accounting for 85.19%) and diversification (accounting for 51.85%. Only 6 of them serve the purpose of financing (accounting for 22.22 %). A summary statistics also reported in table 2 according to our categorization.

Table 2. Summary Statistics of the Purposes

Of the 27 companies, 9 of them issued Swiss Franc denominated convertibles, and 18 of them Eurodollar denominated.

Purpose*	Category 1	Category 2	Category 3
Total number	23	6	14
Percentage	85.19%	22.22%	51.85%

*Category 1 Investment: (1) working capital, (2) expansion of facilities, and (3) future acquisition.
Category 2 Financing: (1) Refinancing outstanding debt, and (2) effective-cost financing.
Category 3 Diversfication: (1) international diversification, or (2) gaining international reputation.

3. Characteristics in Taiwan's Euroconvertibles

When it comes to the option-embedded characteristics of the Euroconvertible, it is just like the Lego ®-playing[1]. We have tabulated these options in Table 3.

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[1] Lego is a kind of child's playthings, which many blocks are used to construct anything as the child wishes.

Table 3. The Embedded Options of the Euroconvertible

Play the Lego® of Euroconvertible			
Option-embedded	Underlying Asset	Writer	Inducement
Call	Issuer's stock	Issuer	Conversion clause
Contingent[2] call	Interest rates	Issuer	Puttable clause
Contingent call	Issuer's credit standing	Issuer	Puttable clause
Contingent put	Interest rates	Investor	Call provision
(Contingent call)	(Conversion price)		
Contingent call	NT dollar	Issuer	Conversion clause

4. Methodology to Exploring the Designing Rationales of Euroconvertibles

With some adjustment, we follow the model of Mishra and Naranyanan (1991) to investigate some rationales behind the design of the Euroconvertibles.

$$RDR = \alpha_0 + \alpha_1 FA + \alpha_2 DE + \alpha_3 RUNUP + \alpha_4 \Delta INT + \alpha_5 \Delta EXZ$$

Variables defined:

A. The dependent variable

RDR (Relative Dilution Ratio): Measuring the ratio of the dilution ratio to the dilution ratio that would be under the same amount of equity financing raising by common stock. That is

$$RDR = \frac{I \cdot EXR + NS}{I \cdot EXR + N\,p}$$

where
I: currency amount raised through Euroconvertible financing
EXR: currency exchange rate at the time of issue of Euroconvertible
p: conversion price at NT$

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[2] We use "contingent" heere, for if the bond is converted, the option will be extinct automatically

S: share price at the time of issue of Euroconvertible

N: number of common shares outstanding at the time issue of Euroconvertible

Assume the initial conversion premium to be CP (which equal to p/s-1), then we could rewrite RDR in the following form:

$$RDR = \frac{1 \cdot EXR/NS + 1}{1 \cdot EXR/NS + 1 + CP}$$

Note that we can realize the RDR variable as if the issuer wishes to weight the debt component more, it will raise the conversion price p, thus, enhancing the CP and plunging RDR, and vice versa. In the light of options, it is equal to say that the issuer sells a less valuable call option on stock to investors.

B. Independent variables:

a. FA (proportion of fixed assets): the ratio of property, plant, and net equipment to total assets at the end of the year prior to announcement date of the Euroconvertible.

b. DE (debt-equity ratio): the ratio of total long-term debt to the market value of equity at the end of year prior to the announcement of the Euroconvertible

c. RUNUP (Run up in stock prices): Three proxies are used to measure delayed equity sold at a premium.

(1) MAR (Cumulative market adjusted stock return)

MAR is defined as the cumulative market adjusted return on the stock over the 248 days between day -250 and day -2, where day 0 is the announcement day of the Euroconvertible issue. That is,

$$MAR = \sum_{t=-250}^{-2} \left(r_{it} - r_{mt} \right)$$

where r_{it} = Stock return on day t

r_{mt} = Market return on day t

and t = 0 is the announcement day of the Euroconvertible issue.

(2) MKT (Cumulative return on market portfolio)

Market run up (MKT) is defined as the cumulative return on the Taiwan Stock Exchange Weighted Index (TAIEX) over the 245 days between day -250 and day -2, where day 0 is the announcement day of the Euroconvertible issue.

(3) RAW (Cumulative raw stock return)

RAW is defined as the cumulative return on the firm's stock over the 248 days between day -250 and day -2, where day 0 is the announcement day of the Euroconvertible issue.

d. Δ INT (Interest rate)

$$\Delta\ INT = \frac{(1/3\ )\sum\limits_{t=-3}^{t=-1} r_t}{(1/12\ )\sum\limits_{t=-12}^{t=-1} r_t}$$

where $t = 0$ is the month of the convertible announcement and r_t is the monthly yield on Long-term (10 years) Treasury Bond for the Eurodollar issues and 5-Year Switzerland Government Note for Swiss franc issues.

e. Foreign exchange rate (Δ EX)

$$\Delta\ EX = \frac{(1/3\ )\sum\limits_{t=-3}^{-1} EX_t}{(1/12\ )\sum\limits_{t=-12}^{t=-1} EX_t}$$

where $t = 0$ is the month of the convertible announcement and r_t is the monthly average on the foreign exchange rate.

C. Relationship

After defining all the variables used to test the parameters related to the design of an Euroconvertible, we explain their hypothesized relationship as follows.

a. According to agency theories, we can infer that the higher the proportion of fixed assets, the higher the probability that the debt is secured, thus reducing the incentive and feasibility to shift risk. The issuer would like to evaluate its debt component of the Euroconvertible more (i.e. to sell the out-of-the-money call option on the stock). If the design of Euroconvertible takes account of the agency costs, we should observe the inverse relation between RDR and FA. Also, the increase in debt-equity ratio would increase the incentive to shift risk for the issuer. Thus, RDR would be positively correlated to DE.

b. With managers' rationales to sell equity at a premium, and to reduce the interest cost, the conversion premium set is positively correlated to the run up in the issuer's stock price. Therefore, negative correlation will hold between RDR and RUNUP. Moreover, we should expect that the equity component to increase

when the interest rates and the foreign exchange rates are high (appreciating in foreign currencies). There comes the positive correlation between RDR and $\triangle INT$, so does RDR and $\triangle EX$. When the interest rate is relatively high, firms would be reluctant to issue the straight bond for the higher funding cost. Thus, if the issuer need a bond-financing, it issues the convertible with a more weight on bond component to save their interest cost. And when the foreign exchange rate goes lower; firms would like to issue foreign securities debt to get advantage of cheaper funding. To enhance its credit rating, the firm would like to issue Euroconvertible with more debt component.

We summarize the hypothesized arguments in Table 4.

Table 4. Hypothesized Relationship between the Dependent and Independent Variables

Dependent variable: RDR

Independent variables	FA	DE	RUNUP	Δ INT	Δ EX
Rationale tested	Agency theory	Agency theory	To sell equity at a premium	Reducing the interest cost	Reducing the interest cost
Coefficient	$\alpha_1(-)$	$\alpha_2(+)$	$\alpha_3(-)$	$\alpha_4(+)$	$\alpha_5(+)$

a. RDR $=\dfrac{I}{I}\dfrac{EXR+NS}{EXR+Np}$,where I: currency amount raised through Euroconvertible financing, EXR : currency exchange rate at the time of issue of Euroconvertible, p: conversion price at NT\$, S: share price at the time of issue of Euroconvertible, N: number of common shares outstanding at the time issue of Euroconvertible.

b. FA (proportion of fixed assets): the ratio of property, plant, and net equipment to total assets at the end of the year prior to announcement date of the Euroconvertible.

c. DE (debt-equity ratio): the ratio of total long-term debt to the market value of equity at the end of year prior to the announcement of the Euroconvertible.

d. RUNUP (Run up in stock prices): Three proxies are used to measure delayed equity sold at a premium.

(1) MAR: Cumulative market adjusted stock return, $MAR=\sum_{t=-250}^{-2}\left(r_{it}-r_{mi} \right)$

(2) MKT: Cumulative return on market portfolio

(3) RAW: Cumulative raw stock return

e. Δ INT: $\Delta INT =\dfrac{(1/3)\sum\limits_{t=-3}^{t=-1} r t}{(1/12)\sum\limits_{t=-12}^{t=-1} r_t}$

f. Foreign exchange rate (Δ EX): $\Delta EX =\dfrac{(1/3)\sum\limits_{t=-3}^{t=-1} EX_t}{(1/12)\sum\limits_{t=-12}^{t=-1} EX_t}$

5. Data Sources

The sample consists of 30 issues within the 32 issued Euroconvertibles. We exclude the President Enterprise issue and the Ever Fortune issue for the unsuitable and insufficient date.

In Table 5, we give the summary statistics of all regression variables.

Table 5. Summary statistics of all regression variables

Variable	Average	Median
RDR	0.934489	0.9388
FA	0.364002	0.3203
DE	0.780234	0.6188
RAW	0.027259	0.0218
MAR	0.062363	0.0076
MKT	0.021023	0.0213
CP	0.078889	0.0705
Δ EX	0.958423	0.9499
Δ INT	1.043162	1.0077

6. Regression Results

Table 6 provides the results of regression on RDR using OLS. All coefficients except α_5 are insignificant. The agency rationale cannot be supported; furthermore, the managerial rationale about the position to use the issuance of Euroconvertibles as the delayed equity sold at a premium also cannot be found under this method. All the coefficients of RUNUP is indifferent from zero, showing that the sentiment of stock market does not affect the design of Euroconvertibles. As for the point of view of lowering the funding cost: to issue the Euroconvertibles rather than straight debts when the level of interest rate is high, tends to be insignificant. We also use this method to testing how the Euroconvertibles react to the level of foreign exchange rate. It presents that when the level is relatively high; i.e, the foreign currencies tend to appreciate, the issuers significantly put more weight on equity component on the design of Euroconvertibles. It might be explained as the surmise that the firm aimed to divisify its funding sources.

Table .6 Regression Using OLS

$$RDR = \alpha_0 + \alpha_1 FA + \alpha_2 DE + \alpha_3 RUNUP + \alpha_4 \Delta INT + \alpha_5 \Delta EX$$

RUNUP Variable	α_0	α_1	α_2	α_3	α_4	α_5	R_2
RAW	0.662**	0.0163	0.0233	-0.0009	0.158	0.0876*	0.305
MAR	0.656**	0.018	0.0232	0.0251	0.09	0.16*	0.306
MKT	0.661**	0.0175	0.0237	0.00683	0.0852	0.158*	0.306

* 5% significant level
** 1% significant level

Notes:

a. $RDR = \dfrac{I \cdot EXR + NS}{I \cdot EXR + Np}$

where I: currency amount raised through Euroconvertible financing, EXR: currency exchange rate at the time of issue of Euroconvertible, p: conversion price at NT$, S: share price at the time of issue of Euroconvertible, N: number of common shares outstanding at the time issue of euroconvertible

b. FA (proportion of fixed assets): the ratio of property, plant, and net equipment to total assets at the end of the year prior to announcement date of the Euroconvertible.

c. DE (debt-equity ratio): the ratio of total long-term debt to the market value of equity at the end of year prior to the announcement of the Euroconvertible

d. RUNUP (Run up in stock prices): Three proxies are used to measure delayed equity sold at a premium.

(1) MAR: Cumulative market adjusted stock return. $MAR = \sum_{t=-250}^{-2} \left(r_{it} - r_{mt} \right)$,

(2) MKT: Cumulative return on market portfolio.

(3) RAW: Cumulative raw stock return.

e. Δ INT (Interest rate): $\Delta INT = \dfrac{(1/3) \sum_{t=-3}^{t=-1} r_t}{(1/12) \sum_{t=-12}^{t=-1} r_t}$

f. Foreign exchange rate (ΔEX): $\Delta EX = \dfrac{(1/3) \sum_{t=-3}^{-1} EX_t}{(1/12) \sum_{t=-12}^{-1} EX_t}$

IV. The Issues of Foreign Exchange Hedging

In this section, we first introduce the two-factor model. Furthermore, the methodology used is explained. Then, we go on to test the proposition raised. Finally, we explain the results and draw the conclusions for this section.

1. Two-factor Model

Jorion (1991) has developed his analysis from APT. The linear relationship between expected equity returns and the sensitivity to stock market and exchange rate movement is as follows:

$$E\left(\widetilde{R}_i \right) = \delta_0 + \delta_1 \beta_i^m + \delta_s \beta_i^s \tag{1}$$

As the market obeys (1), we have,

$$E\left(\widetilde{R}_m \right) = \delta_0 + \delta_1 \beta_m^m + \delta_s \beta_m^s \tag{2}$$

which implies $\beta_m^s = 0$.

Next, decompose the rate of return on firm i at time t in the following form, under the assumption of stationary,

$$\widetilde{R}_{it} = E\left(\widetilde{R}_{it} \right) + \beta_i^m \left[\widetilde{R}_{mt} - E\left(\widetilde{R}_{mt} \right) \right] + \beta_i^s \widetilde{F}_{st} + \widetilde{\varepsilon}_{it} , \tag{3}$$

where $\widetilde{F}_{st}$ is the residual after running the regression of $\widetilde{R}_{st}$ on $\widetilde{R}_{mt}$.
By (2) and (3), we have

$$\widetilde{R}_{it} = \left[\left(1 - \beta_i^m \right) \delta_0 + \beta_i^s \delta_s \right] + \beta_i^m \cdot \widetilde{R}_{mt} + \beta_i^s \widetilde{F}_{st} + \widetilde{\varepsilon}_{it} \tag{4}$$

The above model is what we want to test. If the estimate of the coefficient δ_0 is nonzero, then the component of exchange rate risk is priced.

2. Methodology

In the empirical analysis, we first conduct the following regression using

OLS:

$$\widetilde{R}_i = \gamma_0 + \gamma_1 \widetilde{R}_{mi} + \widetilde{F}_{si} \qquad (5)$$

Then we estimate the parameters (δ , β) using maximun-likelihood procedure. By employing generalized least squares (GLS) estimation, using the algorithm of Gibbons (1982), we iterate on the parameters and renew the covariance matrix until converging.

3. Data Structure

We use the monthly data from May 1989 to September 1995 to conduct the tests. Of our sample, 22 issues of the Euroconvertibles are selected for the test, others are excluded for they were not listed before May 1989. Note that all firms in our samples have used the foreign financing.

Yields on one-month commercial paper are proxied as risk-free rate in calculating risk-adjusted returns. The series of commercial paper rate and series of stock returns are provided by TEJDB. As for the exchange rate, R_{st}, we use the trade-weighted exchange rate index as a proxy variable, which is also provided by TEJDB. A rise in R_{st} denotes the depreciation of foreign currencies. The market return, R_{mt}, is the value-weighted index of all firms listed on Taiwan Stock Exchange.

Table 7 reports the systematic risk and exchange rate exposure of these 22 issuers. The exposure coefficient, β , is reported after projection on the market. For different issues the coefficients appear to differ.

Table 7. Exchange rate exposure of Euroconvertible issuers

Two–Factor Model: $\tilde{R}_{it} = \alpha_i + \beta_i^m \tilde{R}_{mt} + \beta_i^s \tilde{F}_{st} + \tilde{\varepsilon}_{it}$

(Monthly Data, May 1989–September 1995)

Issuers	Market Beta	Exch. Rate Beta (after Projection on Market)	
TAIEX Code	β^m	β^s	$s(\beta^s)$
1103	0.735*	0.066	0.050
1209	1.025*	0.067	0.053
1210	0.952*	0.077	0.072
1216	0.684*	0.097	0.060
1303	0.835*	–0.020	0.051
1402	0.811*	–0.001	0.049
1433	0.722*	0.015	0.052
1504	0.714*	0.122*	0.047
1602	0.968*	0.052	0.061
1604	⌐0.893*	0.123*	0.058
1605	0.975*	0.099	0.063
1606	0.699*	0.062	0.056
1904	0.796*	0.078	0.067
1907	0.727*	0.166*	0.059
2006	0.833*	0.180*	0.061
2007	1.081*	0.085	0.091
2303	0.955*	0.081	0.083
2304	0.870*	0.008	0.080
2305	0.845*	0.127	0.078
2306	0.976*	0.146	0.082
2506	0.891*	–0.078	0.063
2903	0.706*	0.027	0.046

*Significant at the 5-percent level.

4. Empirical Results

Our sample period, May 1989-September 1995, contains 77 observations for all the 22 issuers' stock returns, the market return, and the movement of exchange rate.

Table 8 shows the results of our tests. The premium of exchange rate exposure, δ_s, is not statistically significant in our sample period. The positive

value for δ_s is consistent with the argument that equity returns of Euroconvertibles issuers will be higher than otherwise if the value of NT dollar rises. But the pricing of foreign exchange rate exposure is insignificant, this signals that the impact of foreign exchange exposure amounts to little. However, it should be noted that the average value of first illustrated that the issuers of Euroconvertibles display cross-sectional differences in their exposure to movements in the value of NT dollar. Next, two-factor model was used to examine whether the foreign currency exposure of these firms was priced. Little evidence supported that the price of the exchange risk is priced in the stock market. As a result, active hedging for the foreign exchange risk cannot affect the cost of capital. The issuers may not hedge against the issuances of the Euroconvertibles under the considerations of their cost of capital.

VI. Summary and Future Studies

This paper has presented the design of the Taiwanese Euroconvertibles and foreign exchange hedging issues.

At first, we are concerned about the rationales of issuing such option-embedded hybrids. After we have tested the possible rationales, the best explanation can be asserted is that the issuers of the Euroconvertibles in Taiwan have aimed to diversify funding sources. However, the variable to proxy the asymmetric information rationale needs further studies. In this paper, unlike Mishra and Narayanan (1991), we are confined to the availability of the issuers' variation of cash flow. We have failed to select proper variables to proxy.

Secondly, we worked on the foreign exchange hedging issue by a viewpoint of the risk-pricing. Only to find that the foreign exchange risk is not priced in the stock market. The issuers of the Taiwanese Euroconvertibles do not need to hedge against the foreign exchange risk in considering of the cost of capital. Further studies about the pricing issue will be examined with the multiple-factor model. Also we have assumed that the price of exchange risk is constant through time. Our tests are so-called tests of nonzero unconditional risk premia. The tests of nonzero conditional risk premia will be more valuable.

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