The performance of REIT in Taiwan

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1. Introduction:

REIT was first introduced in the United States in 1960 under the Real Estate Investment Trust Act (REITA). It was not very popular for over three decades. In the past few years, Real Estate Investment Trust (REIT) has become one of the most popular ways to invest in real estate all over the world. Many countries established legal environment for organizing REIT. In 2002, Taiwan passed the law for real estate securitization. Under that law, business entities or financial institutions in Taiwan are allowed to establish a REIT to hold and operate real estate properties. Since then, it has become a popular way to invest in real estate in Taiwan.

This article attempts to investigate the performance of REIT in Taiwan after its inception in 2004. The launch of REIT is an important step in the development of the Taiwan real estate market and the financial market as well. In the real estate market, REIT provides a liquid instrument to small investors who used to be excluded from the real estate market because of the large amount of money usually required to invest in real estate. REIT also provides liquidity that traditional forms of real estate investments do not enjoy. More importantly, REIT changed the concept of investing in real estate properties in Taiwan. Traditionally, in Taiwan the main purpose of investing in real estate market was obtaining price gains. Rent revenues were only considered as the secondary source of profit. This is due to the fact that Taiwan real estate properties experienced a period of dramatic price increases in 1980s, so that the rent revenues were overshadowed. The continuous increase in property price without compatible rent increases eventually led to a bubble and a decade-long slump in the real estate market starting from early 1990s. An important character of REIT is its ability to generate high and stable dividend streams. The inception of REIT in Taiwan brings property investors’ attention back to a property’s ability to generate rents.

In this paper, our interest in REIT is not limited to its performance as a vehicle for investing in real estate properties. We are also interested in its relative performance compared with other financial assets such as a general stock index. Investigating REIT’s performance compared with a general stock index is extremely informative to most investors who tend to invest in a balanced portfolio rather than a single asset.

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3 In early 1970s, Australia became the first country to establish the REIT type security outside the US. Starting from 1990s, many countries including Japan, Taiwan, United Kingdom, Hong Kong and others, established their own REIT.
To investigate this relationship, this paper adopts a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model which was used by Najand, Lin and Fitzgerald (2006) to study the performance of the REIT stocks in United States. The GARCH model allows the risk and returns to vary over time. It also deals with the volatility clustering phenomenon that is prevalent in financial data.

The structure of the article is as follows. Section 1 is introduction. Section 2 introduces the Taiwan REIT market. Section 3 is the empirical results. Section 4 is the conclusion.

2. The Taiwan REIT

The real estate Securitization Law (The Law, hereafter) in Taiwan was passed in the summer of 2003. The Law is comprised of two parts. One is Real Estate Asset Trust (REAT), which allows a real estate owner to establish a Trust to hold real estate properties as collateral for the purpose of issuing prioritized classes of securities. The securities are then sold to the investors. The investors tend to purchase higher rated classes. The other is Real Estate Investment Trust (REIT), which allows the originator of the REIT to issue beneficiary certificates to raise funds from investors for the purpose of investing in real estate properties.

The best way to understand the Taiwan REIT is to look at it as a closed end mutual fund for investing in real estate properties. The fund raised from selling beneficiary certificates to investors is used to purchase real estate properties. The properties are then entrusted to a trustee, who can manage the properties by himself or hire an outside management team. The fund has to be invested in real estate properties that have been generating stable rent income. There is no income tax at the trust level. The net income of the trust should be distributed to investors as dividends. Investors will pay a flat 6% income tax on the dividends received regardless of their individual marginal tax bracket. This should be considered as a favor to the REIT investors because 6% is the minimal tax bracket in Taiwan. In writing the Law, the legislature in Taiwan was very careful about protecting investors of REIT. In the following, we shall discuss a few of the important protection provided by the Law to the investors.

1) A REIT is prohibited from investing in real estate properties that are not generating stable rent income. This clause tries to prevent the REIT from getting

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4 The closest financial product to the Taiwan REAT is commercial mortgage backed security (CMBS). The biggest difference between these two financial products is in the collateral used to back up the security. The Taiwan REAT uses real estate property itself as the collateral; while CMBS uses the mortgage loans as the underlined collateral.

5 This clause prevents fund managers from raising the fund for the purpose of developing real estate properties because real estate properties do not have stable rent income.
into risky investment. However, it also excludes the possibility of investing a REIT’s fund in a development project, because a project under development does not have stable rent income.

2) A REIT is allowed to invest its fund in financial assets. However, the authority imposes strict restrictions on the types and the amount of financial assets that a REIT can invest.

3) The assets of the REIT have to be entrusted to a trustee. The trustee should act on behalf of the benefit of the investors. The conducts of the trustee are subject to strict regulations.

4) Any transaction that costs more than NT$ 100 million will need an appraisal report; any transaction that costs more than NT$ 300 million will need two appraisal reports from two independent appraisers.

5) A Taiwan REIT is required to pay its net earning as dividends annually. This payout certainly reduces the amount of free cash flow and may possibly reduce the chance of inefficient use of funds.

6) The requirement in disclosing financial information increases the transparency of financial status of the REIT compared to a regular company listed in Taiwan stock exchanges.

3. The Empirical Results

The first REIT in Taiwan, Fubon R1, was enlisted in Taiwan Stock Exchanges on March 10, 2005. At the time, it was regarded by the market as an attractive financial product for its high and stable annual dividend yield and tax advantage over many other form of investment. Soon, many REITs were issued in the market. To this date, there are 8 REITS traded in Taiwan Stock Exchanges. We form a REIT index using these 8 REIT in the market. The market value of each REIT stock is used as the weights for the index. The REIT index starts from March 10th, 2005 and ends on March 21, 2008, giving us 752 observations. In order to make comparison between the REIT index and the general stock index easier, we set the REIT index on March 10th 2005 at 6534, the exact level of the general stock market index on that very same day. We plotted the market values of theses REITs in Figure 1. Because the REIT in Taiwan have never changed the numbers of their shares, these market value changes are caused only by a

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It is required by the Law that a Taiwan REIT should pay dividends annually, but the payout ratio was not stated explicitly in the Law. Many REIT in Taiwan simply payout all of its net earnings after putting aside a certain amount of reserve for future needs.

At the time, Fubon R1 boasted 3.87% of annual dividend yield while time deposit only offered less than 2% of annual interest rate. Also, the dividends received by investors will be taxed at only 6%, the lowest tax bracket in Taiwan, while many other financial assets are taxed at the investor’s marginal tax rate.
change in stock prices.

We use Taiwan Stock Exchanges Weighted Stock Index (TAIEX) to proxy the market rate of Returns. To get a feeling about how the REIT index moves with TAIEX, we plot the TAIEX and the REIT index in Figure 1.

During the period of study, the Taiwan stock market experienced a boom market, with the stock index value going up for about 40%. From Figure 1, we can see that the value of the Taiwan REIT has been very stable since its inception even when the stock market experienced a much more volatile fluctuation. This is consistent with the general belief that REIT return is much more stable than the return in general stock market. The Taiwan REIT value moved up steadily along with the stock market boom in the first two years of our sample period. Then the REIT values declined because the stock market experienced a sharp increase in price, which took investors’ attention away from REIT. We present the summary statistics of the REIT excess returns, ($r_t$), and the excess returns to TAIEX, ($r_{TAIEX}$), in Table 1.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Number of Sample</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
</table>

5
During our study period, both the average and the standard deviation of the TAIEX were much higher than those of REIT. The Jarque-Bera test indicates that both financial returns are not normally distributed.

Table 2 presents the correlation coefficients between \( r_t, r_{Ta,t}, \) and \( \Delta i_t \). The correlation coefficient between \( r_t \) and \( r_{Ta,t} \) is 0.1954, which is not high, implying that the REIT can be used as an effective financial instrument to diversify away the risk of the general stock market movements. Najand, Lin and Fitzgerald (2006) also use daily observations to calculate the correlation coefficient between the returns of S&P 500 index and a REIT index. They estimate the correlation coefficient between these two indexes to be 0.486, much higher than that of Taiwan.

<table>
<thead>
<tr>
<th></th>
<th>( r_t )</th>
<th>( r_{Ta,t} )</th>
<th>( \Delta i_t )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r_t )</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( r_{Ta,t} )</td>
<td>.1954</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>( \Delta i_t )</td>
<td>.0176</td>
<td>.0567</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

\( r_t \) is the rate of returns of REIT \( r_{Ta,t} \) is the rate of returns of TAIEX \( \Delta i_t \) is the first difference of one month deposit rate.

To investigate the relationship between the REIT returns and the returns to the market portfolio, we estimate the following risk-returns tradeoff equation:
Equation (1) is the mean equation that explains the returns to the REIT stocks, where \( r_i \) is the excess return to the REIT index or TAIEX; \( x_i \) is a set of exogenous variables that may have impacts on excess returns; \( \varepsilon_i \) is the residual. Possible candidates for \( x_i \) include interest rate, market excess returns, and any other variables that may explain the returns to the REIT index. Equation (2) is Bollerslev’s generalized autoregressive heteroskedasticity (GARCH) specification of the volatility equation. This specification is an extension of Engle’s (1982) ARCH specification. The purpose of an ARCH type specification is to catch the volatility clustering phenomenon in data. An advantage of the GARCH model over the ARCH model is its ability to reduce the lags that may be necessary in an ARCH specification. Bollerslev, Chou, and Kroner (1992) find that GARCH(1,1) fits most financial time series well. Najand, Lin and Fitzgerald (2006) find that GARCH(1,1) model fits the REIT data well.

The above specification can be easily extended to a GARCH-in-Mean model by adding the measure of volatility to the mean equation:

\[
y_i = x_i' \lambda + \delta \sigma^2_i + \varepsilon_i
\]

Equation (3) indicates that the volatility measure, \( \sigma^2_i \), has an impact on the rate of returns. The parameter, \( \delta \), should be positive implying that the variance of \( \varepsilon_i \) has a positive impact on the returns of the financial asset. An alternative form of the GARCH-in mean specification is using \( \sigma_i \) as the measure of volatility:

\[
y_i = x_i' \lambda + \sigma_i + \varepsilon_i
\]

For our explanatory variable, \( x_i \), we consider using the return of TAIEX, \( r_{td} \) and interest rate, \( i_t \). The selection of the TAIEX return as an explanatory variable is inspired by CAPM, which states that the excess returns to a certain financial asset should be a linear function of excess returns to the market portfolio. We include an interest rate variable because in literature, REIT returns are often affected by interest rate. For our study, we are most interested in the intercept in the above model. Jensen (1972) suggested using the intercept to measure the performance of mutual funds. The intercept is referred to as Jensen’s alpha in literature. A positive and significant intercept means that the portfolio performs better than the market portfolio, and a higher value of Jensen’s alpha indicates a better performance of the mutual fund.
given the risk taken by the mutual fund.

Before we estimate the model, we need to examine the order of integration in the data. This procedure is necessary because the spurious regression problem can occur when Integration of order one variables are used for regression. We applied the Augmented Dickey Fuller Test (ADF) on four variables, the excess returns to the TAIEX index, $r_{T}$, the excess returns to the REIT index, $r$, interest rate, $i$, and the change of interest rate, $\Delta i$. The results are reported in Table 3.

Table 3
Augmented Dickey-Fuller Test for Unit Root

<table>
<thead>
<tr>
<th>Variables</th>
<th>Lag(3)</th>
<th>Lag(4)</th>
<th>Lag(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r$</td>
<td>-11.475 ***</td>
<td>-10.931 ***</td>
<td>-10.861 ***</td>
</tr>
<tr>
<td>$r_{T,i}$</td>
<td>-13.208 ***</td>
<td>-12.067 ***</td>
<td>-11.836 ***</td>
</tr>
<tr>
<td>$i$</td>
<td>-0.658</td>
<td>-0.660</td>
<td>-0.662</td>
</tr>
<tr>
<td>$\Delta i$</td>
<td>-14.054 ***</td>
<td>-12.636 ***</td>
<td>-11.597 ***</td>
</tr>
</tbody>
</table>

*** indicates a rejection of the null hypothesis of unit root at 1% significance level.

Both stock returns and REIT returns reject the unit root hypothesis. The interest rate, $i$, fails to reject the unit root hypothesis. Therefore, we take the first difference of the interest rate to obtain the change of interest rate, and reject the unit root hypothesis. Even though we found a minor correlation between TAIEX and REIT returns, our main interest in this research is in the existence of a systematic relationship between the returns to these two indexes. We estimate this relationship using a conditional CAPM framework.

The mean equation defines the relationship between returns to REIT and returns to the market portfolio or other instrumental variables that may have predictive content on the returns to REIT. In models (5), (5-1) and (5-2), contemporaneous return to the market portfolio, $r_{T,i}$, is used to explain the REIT returns.

$$r = \alpha_0 + \alpha_1 r_{T,i} + \epsilon,$$  \hspace{1cm} (5)

$$r = \alpha_0 + \alpha_1 r_{T,i} + \alpha_4 \sigma_i + \epsilon,$$  \hspace{1cm} (5-1)

$$r = \alpha_0 + \alpha_1 r_{T,i} + \alpha_4 \sigma_i^2 + \epsilon,$$  \hspace{1cm} (5-2)

Model (5) is the traditional market specification with the variance specified as a GARCH (1,1) model. Models (5-1) and (5-2) consider the GARCH-in-Mean effect.
with volatility measured by standard deviation, $\sigma_r$, and variance, $\sigma_r^2$, respectively.

In models (6), (6-1) and (6-2), we use the previous REIT returns, $r_{i-1}$, and the change of interest rate, $\Delta i$, to explain the return on REIT. Equations (6-1) and (6-2) consider the GARCH-in-Mean effect with volatility measured by standard deviation, $\sigma_r$, and variance, $\sigma_r^2$, respectively.

\[
\begin{align*}
    r_t &= \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 \Delta i_t + \alpha_3 \sigma_r + \varepsilon_t. \\
    r_t &= \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 \Delta i_t + \alpha_3 r_{t-1} + \alpha_4 \sigma_r + \varepsilon_t. \\
    r_t &= \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 \Delta i_t + \alpha_3 r_{t-1} + \alpha_4 \sigma_r^2 + \varepsilon_t.
\end{align*}
\]  

Then finally, in equation (7) we estimate a set of models that consider using all three explanatory variables in the above two specification as explanatory variables. Equations (7-1) and (7-2) consider the GARCH-in-Mean effect with volatility measured by standard deviation, $\sigma_r$, and variance, $\sigma_r^2$, respectively.

\[
\begin{align*}
    r_t &= \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 \Delta i_t + \alpha_3 r_{t-1} + \alpha_4 \sigma_r + \varepsilon_t. \\
    r_t &= \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 \Delta i_t + \alpha_3 r_{t-1} + \alpha_4 \sigma_r + \alpha_5 \sigma_r^2 + \varepsilon_t. \\
    r_t &= \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 \Delta i_t + \alpha_3 r_{t-1} + \alpha_4 \sigma_r^2 + \alpha_5 \sigma_r^2 + \varepsilon_t.
\end{align*}
\]  

All models described above are estimated with the variance of the residual terms specified as a GARCH(1,1) form:

\[
\sigma_r^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2.
\]  

The results of estimating the above models are presented in Table 4. Part A of Table 4 presents the results of estimating various mean equations; Part B of Table 4 presents the results of estimating the variance equations associated with each mean equation in Part A of Table 4.
Table 4
Part A: The Mean Equation

<table>
<thead>
<tr>
<th></th>
<th>( \alpha_0 )</th>
<th>( \alpha_1 )</th>
<th>( \alpha_2 )</th>
<th>( \alpha_3 )</th>
<th>( \alpha_4 )</th>
<th>( \alpha_5 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5)</td>
<td>0.0224635**</td>
<td>0.0686023***</td>
<td>( \alpha_0 )</td>
<td>( \alpha_1 )</td>
<td>( \alpha_2 )</td>
<td>( \alpha_3 )</td>
</tr>
<tr>
<td></td>
<td>(.0103665)</td>
<td>(.0090966)</td>
<td>( .0103665 )</td>
<td>( .0090966 )</td>
<td>( .0103665 )</td>
<td>( .0090966 )</td>
</tr>
<tr>
<td>(5-1)</td>
<td>0.0252386</td>
<td>0.0687649***</td>
<td>( \alpha_0 )</td>
<td>( \alpha_1 )</td>
<td>( \alpha_2 )</td>
<td>( \alpha_3 )</td>
</tr>
<tr>
<td></td>
<td>(.035157)</td>
<td>(.0092877)</td>
<td>( .035157 )</td>
<td>( .0092877 )</td>
<td>( .035157 )</td>
<td>( .0092877 )</td>
</tr>
<tr>
<td>(5-2)</td>
<td>0.0300264*</td>
<td>0.0685146***</td>
<td>( \alpha_0 )</td>
<td>( \alpha_1 )</td>
<td>( \alpha_2 )</td>
<td>( \alpha_3 )</td>
</tr>
<tr>
<td></td>
<td>(.015885)</td>
<td>(.009214)</td>
<td>( .015885 )</td>
<td>( .009214 )</td>
<td>( .015885 )</td>
<td>( .009214 )</td>
</tr>
</tbody>
</table>

|   |   |   |   |   |   |   |
| (6) | 0.0168585* | 5.296188*** | \( \alpha_0 \) | \( \alpha_1 \) | \( \alpha_2 \) | \( \alpha_3 \) | \( \alpha_4 \) | \( \alpha_5 \) |
|     | (.0099967) | (.0092865) | \( .0099967 \) | \( .0092865 \) | \( .0099967 \) | \( .0092865 \) | \( .0099967 \) | \( .0092865 \) |
| (6-1) | -.0003512 | 5.235753*** | \( \alpha_0 \) | \( \alpha_1 \) | \( \alpha_2 \) | \( \alpha_3 \) | \( \alpha_4 \) | \( \alpha_5 \) |
|     | (.0271236) | (.0319382) | \( .0271236 \) | \( .0319382 \) | \( .0271236 \) | \( .0319382 \) | \( .0271236 \) | \( .0319382 \) |
| (6-2) | 0.0198892 | 5.253781*** | \( \alpha_0 \) | \( \alpha_1 \) | \( \alpha_2 \) | \( \alpha_3 \) | \( \alpha_4 \) | \( \alpha_5 \) |
|     | (.0136351) | (.032069) | \( .0136351 \) | \( .032069 \) | \( .0136351 \) | \( .032069 \) | \( .0136351 \) | \( .032069 \) |

|   |   |   |   |   |   |   |
| (7) | 0.0118156 | 0.064317*** | 4.835544*** | \( \alpha_0 \) | \( \alpha_1 \) | \( \alpha_2 \) | \( \alpha_3 \) | \( \alpha_4 \) | \( \alpha_5 \) |
|     | (.0091932) | (.0092166) | \( .0091932 \) | \( .0092166 \) | \( .0091932 \) | \( .0092166 \) | \( .0091932 \) | \( .0092166 \) |
| (7-2) | -.0010402 | 0.644659*** | 4.798587*** | \( \alpha_0 \) | \( \alpha_1 \) | \( \alpha_2 \) | \( \alpha_3 \) | \( \alpha_4 \) | \( \alpha_5 \) |
|     | (.02505) | (.009) | \( .02505 \) | \( .009 \) | \( .02505 \) | \( .009 \) | \( .02505 \) | \( .009 \) |
| (7-3) | 0.0143394 | 0.0645282*** | 4.796032*** | \( \alpha_0 \) | \( \alpha_1 \) | \( \alpha_2 \) | \( \alpha_3 \) | \( \alpha_4 \) | \( \alpha_5 \) |
|     | (.0120648) | (.0093476) | \( .0120648 \) | \( .0093476 \) | \( .0120648 \) | \( .0093476 \) | \( .0120648 \) | \( .0093476 \) |

*", **", and "***" indicate significance at 1%, 5%, and 10% level respectively.

Table 4
Part B: The Variance Equation

<table>
<thead>
<tr>
<th></th>
<th>( \beta_0 )</th>
<th>( \beta_1 )</th>
<th>( \beta_2 )</th>
<th>( \beta_1 + \beta_2 )</th>
<th>Adj.R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5)</td>
<td>0.016862***</td>
<td>0.322075***</td>
<td>0.6356017***</td>
<td>0.9576767</td>
<td>.0369</td>
</tr>
<tr>
<td></td>
<td>(.0013903)</td>
<td>(.0302694)</td>
<td>(.0222956)</td>
<td>0.0369</td>
<td></td>
</tr>
<tr>
<td>(5-1)</td>
<td>0.0168599***</td>
<td>0.3220922***</td>
<td>0.6357695***</td>
<td>0.9578615</td>
<td>.0369</td>
</tr>
<tr>
<td></td>
<td>(.0017718)</td>
<td>(.0310615)</td>
<td>(.0236188)</td>
<td>.0369</td>
<td></td>
</tr>
<tr>
<td>(5-2)</td>
<td>0.0167376***</td>
<td>0.3211004***</td>
<td>0.6379415***</td>
<td>0.9590419</td>
<td>.0369</td>
</tr>
<tr>
<td></td>
<td>(.0016754)</td>
<td>(.029917)</td>
<td>(.0237102)</td>
<td>.0369</td>
<td></td>
</tr>
</tbody>
</table>

| (6) | 0.0154792*** | 0.3055503*** | 0.6521032*** | 0.9576535 | .0128 |
|     | (.0016103) | (.0357086) | (.0290916) | .0128 |
| (6-1) | 0.0154658*** | 0.3052239*** | 0.6516204*** | 0.9568443 | .0128 |
|     | (.0018108) | (.0355667) | (.0312422) | .0128 |
Part A of Table 4 shows that the GARCH-in-Mean effect is not significant in all models estimated. All parameter estimates in the variance equation are positive and significantly different from zero. But volatility of residuals, whether measured in variance or in standard deviation form, does not have an impact on the returns of REIT. In the three models estimated without the GARCH-in-Mean effect, the parameter estimates for the Jensen alpha, $\alpha$, are all positive. In equation (5), where the model is constructed in the spirit of CAPM, the parameter estimate for $\alpha$ is significantly different from 0, but the size of the estimate is about 0.068, a rather small value. That means REIT bears a definite but small systematic risk. Note that this conclusion is robust as we observe that the estimates for $\alpha$ do not change much in various models. Najand, Lin and Fitzgerald (2005) obtained $\alpha$ estimates as around 0.4 using the same model for the US REIT data. Obviously, Taiwan REIT has much smaller market risk than US REIT.

In equation (6), we regress the REIT returns on two instrumental variables: lagged value of the REIT returns, $r_{t-1}$, and the first difference of interest rate, $\Delta i$. Both parameter estimates are significantly different from 0.

In both equations (5) and (6), the parameter estimate for the Jensen alpha, $\alpha$, is positive and significantly different from 0. This means that considering the risk it bears, the Taiwan REIT performs better than the market portfolio. We saw on Table 1 that the average TAIEX return is much higher than the average REIT return during our study period. But the REIT had very small systematic risk. Taking into consideration the much smaller risk that the Taiwan REIT bears, we may reach the conclusion that the Taiwan REIT outperformed the TAIEX during our period of study. We obtain this conclusion even though the TAIEX was experiencing a boom during our period of study.

In equation (7), we regress the Taiwan REIT returns on all three explanatory variables used in equations (5) and (6), and obtain the results that the Jensen alpha,
\( \alpha_n \), is positive but not statistically significant.

Part B of Table 4 summarizes the results of all forms of variance equations. The results are rather robust. Both \( \beta_1 \) and \( \beta_2 \) estimates are significantly different from 0, so the volatility clustering effects exist in the data. The stability condition for the GARCH (1,1) variance equation is \( \beta_1 + \beta_2 < 1 \). All specifications satisfy this condition.

4. Conclusion

In Taiwan, REIT has been established for over three years. To this date, 8 REIT are traded in Taiwan Stock Exchanges. It is considered as an important innovation in the Taiwan financial system in the past few years. In the financial market, REIT offers a financial instrument that pays high and stable dividend incomes. In real estate market, REIT represents a new form of real estate investment. One of its main advantages over the traditional form of real estate investment is in its liquidity. What is more important is that the Taiwan REIT brings real estate investors’ attention back to real estate property’s ability to generate rent income.

To the best of our knowledge, the performance of Taiwan REIT has not been formally investigated. This paper investigates the performance of The Taiwan REIT since its inception date. We compiled a REIT index using all 8 Taiwan REIT to construct a REIT index. We estimated a series of GARCH-in-Mean models. Our results show that the coefficient of the market excess returns is about 0.068. These parameter estimates are statistically significant but small. That means the market risk of the REIT portfolio is very small. We find that the GARCH(1,1) model fits the REIT returns rather well. We also find that the intercept term of the GARCH-in-mean equation is positive which implies that the Taiwan REIT performs better than the market portfolio considering that the Taiwan REIT bears much smaller risk than the market portfolio.
References:


