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Performance of Taiwanese Domestic Equity Funds during Quantitative Easing

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Abstract

This study is the first to analyze performance of Taiwanese domestic equity funds between January 2009 and October 2014, the period during which quantitative redirected capital flows toward developing economies and the Taiwanese Stock Exchange Weighted Index compounded at approximately 12.9% annually. Adopting methods endorsed by earlier research, we evaluated 15 Taiwanese equity funds' performance relative to market averages using the Sharpe (1966) and Treynor (1965) ratios and Jensen's alpha method (1968). To test market timing proficiency, we applied the Treynor and Mazuy (1966) and Henriksson and Merton (1981) regression analysis methods. Jensen's alpha method (1968) was used to measure fund managers' stock selection skills. Results revealed that funds significantly under-performed Taiwan's average annual market return and demonstrated no exceptional stock-selection skills and market timing proficiency during the era of quantitative easing.

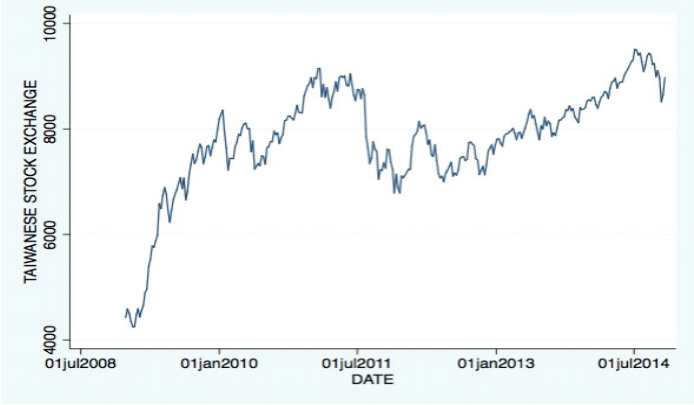
Keywords: Performance evaluation, Quantitative easing, Equity funds, Sharpe ratio, Jensen's alpha.

JEL Classification Codes: G11, F39

1. Introduction

Mutual fund performance has always been one of the most researched areas of finance studies. Using diverse technical measurement methods, these types of studies analyze fund performances of various markets from different perspectives. Especially, after the period of liberalization of the financial markets, mutual funds have gained much more importance among investors, resulting in numerous studies that have been carried out on performance evaluations. According to Deepak (2011), investors invest their money into capital market instruments such as shares, debentures and other securities. The returns from investments are equally shared among shareholders according to their investment ratio. Hence, mutual funds are proper investment and provide the chance to invest different professionally managed financial instruments. According to Rao (2006), diversification of the risk is the main objective of investing in a mutual fund. Diversified portfolios are created by mutual fund investments and fund managers take different levels of risks in order to get maximum value from their investments. Therefore, when comparing and evaluating the investments, returns are measured by taking into account the risks involved in achieving the returns.

The 2008 global crisis devastated the U.S. and European economies and financial markets. During the ensuing recession, significant investment banks collapsed (e.g., Lehman Brothers) and commercial banking crises notably enveloped Portugal, Ireland, Spain, Greece, and Italy. To combat recession, the U.S. Federal Reserve initiated quantitative easing (QE) between December 2008 and October 2014, purchasing huge quantities of sovereign debt to swell the money supply. Its actions were paralleled by central banks globally. QE occurred in four segments: QE1 (December 2008–June 2010), QE2 (November 2010–June 2011), QE3 (September 2012–October 2014), and QE4 (January 2013–October 2014) (Amadeo, 2015).



<Figure 1> Performances of Taiwanese Stock Exchange (January 2009-November 2014)

As recession, market disarray, and QE eroded confidence in

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the U.S. and European markets, investors gravitated toward equity markets in developing economies, including Taiwan. The Taiwan Stock Exchange Weighted Index (TWSE) averaged 12.9% annual growth (Figure 1), outstripping developed market indices—notably the DAX, FTSE 100, and CAC 40, which averaged 12.1%, 6.8%, and 4.1% returns, respectively. Only the S&P500 outperformed the TWSE with 15.1% returns. This study analyzes Taiwanese equity fund performance across the entire QE era.

2. Literature Review

Especially following the liberalization of financial markets, mutual funds have gained importance among investors seeking professional management and diversification of risks. Treynor (1965), Sharpe (1966) and Jensen (1968) are among those who measure fund performance related to risk and return measurements. Sharpe (1966) measured 34 open-ended mutual funds between 1954-1963 using the Sharpe ratio and Treynor ratio. As the result of the study, it has been found out that while 11 funds out of 34 show a better performance than the index, 23 funds under perform their benchmarks. Jensen (1968) examined 115 mutual funds - which were active between 1945-1964 – by using an alpha indicator that he generated. His alpha indicator shows the selectivity skills of fund managers. Based on his results, funds could not outperform the market performance, revealing that mutual fund managers, in general, did not have selective ability.

Malkiel (1995) used the Jensen method to calculate the performance of American funds between the years 1972 and 1990. He revealed that mutual funds could not show positive excess return. Detzler (1999) searched 19 global bond funds by using monthly returns between the years 1985 and 1995. In the study, a multiple regression analysis was used and it was found out that funds could not show better performance than indexes. Dahlquist, Engström and Söderlind (2000) evaluated 201 Swedish mutual funds – including only domestic funds - from the period between 1993 and 1997. They found that regular equity funds seemed to over perform while bond and money market funds performed less. Furthermore, actively managed funds demonstrated better performance than passively managed funds.

With the aim of detecting the market timing ability of the fund managers, Treynor and Mazuy (1966) established the quadratic regression analysis method. They applied this method to 57 open-end mutual funds (25 growth funds and 32 balanced funds). They revealed only a single fund as having statistically significant market timing ability. Henriksson and Merton (1981) and Henriksson (1984) developed both parametric and non-parametric statistical models to the test market timing ability of portfolios. Having been introduced by Henriksson and Merton (1981), the parametric and non-parametric tests in question were applied by Henriksson (1984) to evaluate the market timing ability of 116 open-end funds between 1968 and 1980 in the U.S. market. The results revealed that there wasn't any support for market timing ability. Moreover, Henriksson (1984) found an inverse relationship between selection ability and market timing ability.

Chang and Lewellen (1984) tested the market timing ability of 67 U.S. funds covering the period from 1971 to 1979 by using the Henriksson and Merton (1981) method. It was found that there were weak indications of fund manager market timing ability. Gallo and Swanson (1996) tested 37 U.S. mutual funds by using the Treynor and Mazuy (1966) model for market timing, yet found no evidence of market timing of funds. Christensen (2005) evaluated 47 Danish funds between January 1996 and June 2003. He found that fund managers did not have selectivity skills in general and, in terms of timing ability, the results were also negative, due to the fact that only two funds had significant timing ability.

In Taiwan, Hsu et al. (2012) analyzed the performance and performance persistency of 30 Taiwan open-end equity funds using the Sharpe ratio, the Treynor ratio, and the SRAROC, ERAROC, GRAROC and HRAROC models. Their statistical results indicate that examined funds generated positive returns during bull markets and negative returns during bear markets. Hou (2012) investigated performance persistence and investor timing of 200 Taiwanese domestic equity mutual funds between 1996 and 2009 and showed that investors' timing skills correlated negatively to fund performance. Furthermore, timing correlated significantly and negatively for length of history, fund size, and momentum-style funds, but it correlated positively for value-style funds.

3. Methodology

3.1. Methodology

Adopting methods from earlier research, this study evaluated performance of 15 Taiwanese domestic equity funds using the Sharpe (1966) and Treynor (1965) ratios and Jensen's alpha (1968), which measures fund managers' stock selection skills. To test market timing proficiency, we applied the Treynor and Mazuy (1966) and Henriksson and Merton (1981) regression models.

3.1.1. Treynor Ratio

According to Koulis et al. (2011), Treynor's ratio (Treynor, 1965) is the first measure of mutual fund performance. It is calculated as a fund's excess return divided by its beta (systematic risk) and is defined as

$$Ti = (Rp-Rf)/\beta P \quad (1)$$

where

Ti = Treynor's performance index

Rp= portfolio's period-specific return

Rf= risk-free return in a period

βP = portfolio beta

3.1.2. Sharpe Ratio

The Sharpe technique finalized in 1966 resembles Treynor's ratio (Noulas, Papanastatiou & Lazaridis, 2005), but it employs the standard deviation of fund returns in its denominator instead of portfolio beta. It computes the premium earned per unit of total risk. The Sharpe value is calculated as

Sp=(Rp − Rf/) σp, (2)

where

Sp= Sharpe Ratio

Rp= a fund's average rate of return

Rf= average risk-free return

σp= standard deviation of fund returns.

The Sharpe ratio (Sp) calculates performance for an identified level of total risk. Higher values indicate higher performance (Duggimpudi, Abdou & Zaki, 2010).

3.1.3. Jensen's Alpha

"A portfolio manager's predictive ability (is) his ability to earn returns through the successful forecast of security prices that are higher than those which we could presume given the level of his riskiness of his portfolio" (Jensen, 1968, p. 389).

Jensen's model can be written as

Rpt − Rft = αp + βp (Rmt −Rft) + ept (3)

αp=return on the portfolio adjusted for market returns (i.e., excess returns)

Rpt= returnon portfolio p at time t

Rft=return on a riskless asset at time t

Rmt= return on the market portfolio at time t

βp=sensitivity of excess returns of portfolio t to excess market returns (i.e., above-average market returns).

The sign of alpha displays whether a portfolio manager outperforms the market after adjusting for risk. A positive (negative) alpha denotes above-market (below-market) performance (Mayo, 2010).

3.1.4. Treynor and Mazuy Regression Analysis

Fund managers may out-perform markets if they reconfigure their portfolios promptly and competently when markets rise or fall. That is, they adjust their portfolios from more to less volatile securities when they expect the market to drop and adjust in the opposite direction if they expect it to climb (Treynor & Mazuy, 1966). Also, fund managers may hold a greater (lesser) proportion of the market portfolio if they anticipate a bull market (bear market). Treynor and Mazuy (1966) developed the following model to evaluate market-timing proficiency:

$$R_{i_t} - R_{f_t} = \alpha_i + \beta_{i_0}(R_{m_t} - R_{f_t}) + \beta_{i_1}(R_{m_t} - R_{f_t})^2 + \varepsilon \quad (4)$$

where αi is the timing-adjusted alpha, which represents managers' timing-adjusted stock-selection ability. The quadratic term in Equation (4) is the market-timing factor. The coefficient of the market-timing factor (β_{i_1}) represents managers' market timing proficiency. If β_{i_1} is positive, they have superior proficiency—i.e., their portfolios are adjusted actively to well-anticipated changes in markets; if negative, timing proficiency is poor (Chen et al., 2013).

3.1.5. Henriksson and Merton Regression Analysis

Another return-based measure of timing proficiency, Henriksson and Merton (1981) regression strongly resembles Treynor and Mazuy (1966) regression. It computes whether managers' return on assets exceeds or lags the risk-free rate after selecting a level of risk that reflects their expectation the market will produce positive excess returns (Cesari & Panetta, 2002). The formula is:

Rit-Rft = αi + βi0 (Rmt −Rft) + γi[D (Rmt − Rft)] + ϵ (5)

When Rmt>Rft (up market), D = 1, and when Rmt<Rft, D = 0.

We can rewrite the formula as

Rmt>RftRit-Rft = αi + γi (Rmt −Rft) + βi1 + ϵ

Rmt<RftRit-Rft = αi + γi (Rmt −Rft) + ϵ

4. Data

It is analyzed 15 Taiwanese domestic equity funds using the measures indicated above. The examined period spans the entire era of QE (between January 2009 and October 2014) during which we observed weekly fund returns for 304 weeks. All data are from the Thomson Reuters Data Stream.

4.1. Selection of Equity Funds

According to data of Securities Investment Trust & Consulting Association of the R.O.C, there are totally 648 funds in Taiwan. Among 648 Taiwan-based mutual funds — including equity, balanced, bond, and other funds — we initially considered only Taiwan's 342 equity funds (154 domestic and 188 international funds). The sample is culled in order to analyze only performance of funds invested in domestic Taiwanese companies. We excluded funds that were closed, newly established, or merged with another fund. Also, funds whose size exceeded NT$1 billion were preferred. For final analysis, we selected 15 funds ranked by size (Table 2).

<Table 1> Number of Mutual Funds in Taiwan (11/2014)

Fund Type	Number of Funds	Fund Size (TWD)
Domestic Equity Fund	154	236,513,903,656
International Equity Fund	188	299,792,140,133
Subtotal	342	536,306,043,789
Domestic Balanced Fund	25	24,000,371,944
International Balanced Fund	19	44,005,548,190
Subtotal	44	68,005,920,134
Domestic Fixed-Income Fund	1	3,395,610,670
International Fixed-Income Fund	48	74,299,055,958
Financial Asset Securitization Fund	1	330,858,019
High Yield Bond Fund	36	213,513,922,137
Subtotal	86	291,539,446,784
Domestic Money Market Fund	45	844,039,623,010

International Money Market Fund	8	20,082,371,419
Subtotal	53	864,121,994,429
International Fund of Funds - Equity Fund	12	16,188,050,867
International Fund of Funds - Bond Fund	29	63,589,651,139
International Fund of Funds - Balanced Fund	25	61,109,177,448
International Fund of Funds - Others	3	1,085,505,565
Subtotal	69	141,972,385,019
Principal Guaranteed Fund	8	15,311,030,102
Subtotal	8	15,311,030,102
REITs Fund	12	18,076,128,516
Subtotal	12	18,076,128,516
Domestic Exchange Traded Fund	17	87,946,111,084
International Exchange Traded Fund	6	58,991,302,828
Subtotal	23	146,937,413,912
Domestic Index Fund	3	3,139,209,198
International Index Fund	8	8,215,133,356
Total	648	2,093,624,705,239

Source: This table is taken from http://www.sitca.org.tw/ENG/FundInf/FI2001.aspx?PGMID=FI2001

<Table 2> Taiwanese Equity Funds (31/10/2014)

Fund Name	Fund Size (Taiwan Dollar)
Prudential Financial High Growth Fund	5,035,760,502
Yuanta Excellence Equity Fund	4,234,062,291
Capital OTC Fund	4,075,238,940
Cathay Cathay Fund	3,775,418,346
Nomura Taiwan Superior Equity Fund	3,111,796,660
HSBC TAIWAN Phoneix Fund	3,101,802,898
Allianz Global Investors Taiwan Fund	3,057,852,230
SinoPac Fund	2,862,141,013
FuhHwa High Growth Fund	2,725,794,332
UPAMC All Weather Fund	2,242,865,487
JPMorgan (Taiwan) Growth Fund	1,870,231,510
PineBridge TAIWAN Giant Fund	1,867,370,812
Fidelity Taiwan Growth Fund	1,577,841,479
Franklin Templeton SinoAm First Fund	1,460.418,340
Jih Sun Fund	1,207,041,244

4.2. Returns on Funds

Logarithmic returns of funds were computed over weekly price indices of funds. For the study, 304 weeks of data between January 9, 2009 and October 31, 2014 are used.

$$Rp = \ln (Pt / Pt\text{-}1) \quad (6)$$

where

Rp= return on the fund

Pt= price of the fund at week t

Pt-1 = price of the fund at week t-1

4.3. Benchmark

In this study, the Taiwanese Stock Exchange (Táiwān Zhèngquàn Jiāoyì Suǒ) price index is used in order to find whether equity funds surpass the market.

$$Rm = \ln (Pmt / Pmt\text{-}1) \quad (7)$$

where

Rm = returns on the TWSE

Pmt= value of the TWSE Price Index on week t

Pmt-1 = value of the TWSE Price Index on week t-1

4.4. Risk-free Rate

In this study, the Taiwan 1-month deposit rate is used as a proxy sourced from Thomson Reuters Data Stream. Hou (2012) used the 1-month deposit rate in his previous study.

5. Empirical Results

Descriptive statistics of Taiwanese equity funds, benchmarks, and risk-free rates appear in Table 3. The Average column indicates returns on funds, benchmarks, and risk-free rates. Average returns for Allianz Global Investors Taiwan Fund, Capital OTC Fund, Cathay Fund, Franklin Templeton Sino Am First Fund, FuhHwa High Growth Fund, Nomura Taiwan Superior Equity Fund, Pine Bridge Taiwan Giant Fund, Prudential Financial High Growth Fund, Sino Pac Fund, and UPAMC All Weather Fund surpassed returns on the TWSE during the period. Taiwanese funds, in general, performed better during QE.

The Skew column displays the skew of equity funds and corresponding values of their benchmarks. All funds, benchmarks, and one-month deposit rates are negatively skewed. All fundsand benchmarks have positive kurtosis, which imply typical heavy tailed financial distributions. The risk-free rate exhibits negative kurtosis, implying a relatively flat distribution. The R column shows correlations between funds and benchmarks. The average correlation (0.89363) is strongly positive. HSBC Taiwan Phoenix Fund has the highest correlation (0.97244) and Pine Bridge Taiwan Giant Fund the lowest (0.82290). The Standard Deviation column shows the volatility of equity funds, benchmarks, and risk-free rates. Other than Yuanta Excellence Equity Fund and the HSBC Taiwan Phoenix Fund, all funds were more

volatile than the TWSE, indicating higher risk.

The last column displays betas, a measure of funds' systematic risk. Four funds' betas exceed 1, and betas for all other funds are near 1, indicating Taiwanese funds carry higher or similar risk compared to the benchmark TWSE index.

<Table 3> Descriptive Statistics of Taiwanese Funds

Fund Name	Average	Skew	Kurtosis	R	Std. dev.	Beta
Allianz Global Investors Taiwan Fund	0.00362	-0.32967	1.20099	0.88095	0.02630	0.95932
Capital OTC Fund	0.00335	-0.15718	0.80151	0.82560	0.03028	1.03662
Cathay Fund	0.00255	-0.40223	1.25657	0.89871	0.02493	0.92920
Fidelity Taiwan Growth Fund	0.00204	-0.36467	2.80054	0.96835	0.02583	1.03573
Franklin Templeton Sino Am First Fund	0.00279	-0.29577	1.38435	0.90420	0.02570	0.96399
FuhHwa High Growth Fund	0.00290	-0.48026	1.07085	0.87521	0.02577	0.93420
HSBC Taiwan Phoenix Fund	0.00219	-0.57284	1.59019	0.97244	0.02207	0.88905
Jih Sun Fund	0.00111	-0.47466	1.31417	0.83715	0.02801	0.97230
JP Morgan Taiwan Growth Fund	0.00219	-0.20729	2.14453	0.94898	0.02729	1.07196
Nomura Taiwan Superior Equity Fund	0.00301	-0.36154	1.84144	0.86739	0.02811	1.01002
Pine Bridge Taiwan Giant Fund	0.00236	-0.45159	0.77791	0.82290	0.02802	0.95610
Prudential Financial High Growth Fund	0.00221	-0.4307	0.86042	0.88799	0.02569	0.94580
Sino Pac Fund	0.00260	-0.16078	1.77973	0.92220	0.02492	0.95288
UPAMC All Weather Fund	0.00349	-0.32086	0.93728	0.84719	0.02836	0.99567
Yuanta Excellence Equity Fund	0.00156	-0.51848	1.62461	0.94525	0.02354	0.92230
Taiwanese Stock Exchange (TWSE)	0.00220	-0.35912	1.82517		0.02413	
1-Month Deposit Rate	0.00180	-0.89315	-0.90678		0.00054	

Table 4 shows performance of the Sharpe ratio. Higher values imply better performance. Allianz Global Investors Taiwan Fund, UPAMC All Weather Fund, and Capital OTC Fund display the highest Sharpe ratios. Yuanta Excellence Equity Fund, Jih Sun Fund, and Fidelity Taiwan Growth Fund display the lowest. Except Jih Sun Fund and Yuanta Excellence Equity Funds, all other funds have positive Sharpe ratio.

<Table 4> Results of the Sharpe Ratio for Taiwan

Fund Name	Sharpe	Rank
Allianz Global Investors Taiwan Fund	0.06924	1
UPAMC All Weather Fund	0.05971	2
Capital OTC Fund	0.05125	3
Nomura Taiwan Superior Equity Fund	0.04310	4
FuhHwa High Growth Fund	0.04290	5
Franklin Templeton Sino Am First Fund	0.03866	6
Sino Pac Fund	0.03223	7
Cathay Fund	0.03043	8
Pine Bridge Taiwan Giant Fund	0.02013	9
HSBC Taiwan Phoenix Fund	0.01810	10
Prudential Financial High Growth Fund	0.01609	11
JP Morgan Taiwan Growth Fund	0.01443	12
Fidelity Taiwan Growth Fund	0.00944	13
Yuanta Excellence Equity Fund	-0.00986	14
Jih Sun Fund	-0.02453	15

Table 5 shows performance of the Treynor ratio. Funds with higher Treynor ratios produced better risk-adjusted returns than funds with lower ratios. Allianz Global Investors Taiwan Fund, UPAMC All Weather Fund, and Capital OTC Fund have the highest Treynor ratios. Yuanta Excellence Equity Fund, Jih Sun Fund, and Fidelity Taiwan Growth Fund have the lowest. Except Yuanta Excellence Equity Fund and Jih Sun Fund, all other funds have positive Treynor ratio as Sharpe ratio.

<Table 5> Results of the Treynor Ratio for Taiwan

Fund Name	Treynor	Rank
Allianz Global Investors Taiwan Fund	0.00190	1
UPAMC All Weather Fund	0.00170	2
Capital OTC Fund	0.00150	3
Nomura Taiwan Superior Equity Fund	0.00120	4
FuhHwa High Growth Fund	0.00118	5
Franklin Templeton Sino Am First Fund	0.00103	6
Sino Pac Fund	0.00084	7
Cathay Fund	0.00082	8
Pine Bridge Taiwan Giant Fund	0.00059	9
HSBC Taiwan Phoenix Fund	0.00045	10
Prudential Financial High Growth Fund	0.00044	11
JP Morgan Taiwan Growth Fund	0.00037	12
Fidelity Taiwan Growth Fund	0.00024	13
Yuanta Excellence Equity Fund	-0.00025	14
Jih Sun Fund	-0.00071	15

Table 6 presents Jensen's alphas, which measure managers'stock-selection skills relative to the market. Although 11 of the 15 funds have positive alphas, only Allianz Global Investors Taiwan Fund is positive and statistically significant at 5%. Four funds have negative alphas, all statistically insignificant. Taiwanese equity funds did not demonstrate exceptional stock-selection skills during the period.

<Table 6> Results of Jensen's alpha for Taiwan

Fund Name	alpha	t stat	p-value
Allianz Global Investors Taiwan Fund**	0.00143	1.99746	0.04667
UPAMC All Weather Fund	0.00129	1.48542	0.13847
Capital OTC Fund	0.00113	1.14870	0.25159
Nomura Taiwan Superior Equity Fund	0.00080	0.99316	0.32143
FuhHwa High Growth Fund	0.00072	1.00995	0.31333
Franklin Templeton Sino Am First Fund	0.00060	0.94925	0.34325
Sino Pac Fund	0.00041	0.74617	0.45615
Cathay Fund	0.00038	0.60193	0.54767
Pine Bridge Taiwan Giant Fund	0.00017	0.18885	0.85034
HSBC Taiwan Phoenix Fund	0.00004	0.12037	0.90427
Prudential Financial High Growth Fund	0.00003	0.03874	0.96912
JP Morgan Taiwan Growth Fund	-0.00004	-0.09079	0.92772
Fidelity Taiwan Growth Fund	-0.00018	-0.48611	0.62724
Yuanta Excellence Equity Fund	-0.00061	-1.38103	0.16829
Jih Sun Fund	-0.00109	-1.23270	0.21865

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Table 7 displays the results of the Treynor and Mazuy (1966) analysis of managers'market timing proficiency. Only Sino Pac Fund and JP Morgan Taiwan Growth Fund demonstrate such proficiency during the period; however, both are statistically insignificant. Results for the remaining 13 funds are negative and statistically insignificant. HSBC Taiwan Phoenix is statistically significant at 1%, whereas Yuanta Excellence Equity Fund, FuhHwa High Growth Fund, and Prudential Financial High Growth Fund are statistically significant at 5%. Nomura Taiwan Superior Equity Fund and Jih Sun Fund are statistically significant at 10%. Analysis indicates Taiwanese fund managers lacked market timing proficiency during the period.

<Table 7> Results of the Treynor & Mazuy Regression Analysis for Taiwan

Fund Name	T & M	t-stat	p-value
Sino Pac Fund	0.35304	0.72196	0.47088
JP Morgan Taiwan Growth Fund	0.18468	0.42237	0.67305
Allianz Global Investors Taiwan Fund	-0.04179	-0.06614	0.94731
Fıdelity Taiwan Growth Fund	-0.37980	-1.16181	0.24623
Franklin Templeton Sino Am First Fund	-0.46129	-0.82843	0.40808
UPAMC All Weather Fund	-0.60749	-0.79467	0.42743
Cathay Fund	-0.70434	-1.27174	0.20445
Yuanta Excellence Equity Fund**	-0.82547	-2.13207	0.03381
Capital OTC Fund	-0.87197	-1.00652	0.31497
HSBC Taiwan Phoenix Fund***	-1.00656	-3.95870	0.00009
Pine Bridge Taiwan Giant Fund	-1.05572	-1.30948	0.19137
Prudential Financial High Growth Fund**	-1.19875	-2.01108	0.04521
FuhHwa High Growth Fund**	-1.24855	-1.98527	0.04802
Nomura Taiwan Superior Equity Fund*	-1.32120	-1.87044	0.06239
Jih Sun Fund**	-1.72785	-2.23871	0.02590

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Table 8 shows results of Hendriksson and Merton (1981) analysis, another measure of market timing proficiency — i.e., whether managers can forecast markets well enough to surpass the risk-free rate. Only two funds show proficiency, but results are statistically insignificant. 13 funds have negative market timing proficiency, but only results for HSBC Taiwan Phoenix Fund are statistically significant at 10%.

<Table 8> Results of the Henriksson and Merton Regression Analysis for Taiwan

Fund Name	H & M	t-stat	p-value	
JP Morgan Taiwan Growth Fund	0.00585	0.16159	0.87174	
Sino Pac Fund	0.00578	0.14249	0.88679	
Allianz Global Investors Taiwan Fund	-0.00787	-0.15037	0.88058	
Franklin Templeton Sino Am First Fund	-0.02572	-0.55723	0.57779	
Cathay Fund	-0.03028	-0.65867	0.51061	
Fidelity Taiwan Growth Fund	-0.03029	-1.11832	0.26432	
UPAMC All Weather Fund	-0.03294	-0.51975	0.60362	
Yuanta Excellence Equity Fund	-0.03704	-1.14855	0.25165	
Prudential Financial High Growth Fund	-0.03718	-0.74861	0.45467	
Pine Bridge Taiwan Giant Fund	-0.03878	-0.57932	0.56281	
HSBC Taiwan Phoenix Fund*	-0.04159	-1.93677	0.05371	
Nomura Taiwan Superior Equity Fund	-0.04267	-0.72554	0.46868	
Capital OTC Fund	-0.04507	-0.62736	0.53089	
FuhHwa High Growth Fund	-0.06692	-1.27959	0.20167	
Jih Sun Fund	-0.06998	-1.08756	0.27766	

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

6. Conclusion

This study—the first to rate Taiwanese mutual funds during the era of quantitative easing—examined the performance of 15 Taiwanese domestic equity funds from January 2009 to October 2014. During that period, Taiwan's stock market index outperformed all developed market indexes except the S&P 500. It is measured performance using the Sharpe ratio (1966), Treynor ratio (1965), Jensen alpha (1968), Treynor and Mazuy (1966) analysis, and Henriksson and Merton (1981) analysis. Sharpe (1966) and Treynor (1965) ratios, which measure risk-adjusted performance, indicated similar rankings for all mutual funds. Allianz Global Investors Taiwan Fund, UPAMC All Weather Fund, Capital OTC Fund have the highest ratios for both. The Jensen's alpha (1968), Treynor and Mazuy (1966) and Henriksson and Merton (1981) analyses determined stock-selection skills and market timing proficiency, respectively. In this work, it is revealed that in the era of quantitative easing, although the financial market in Taiwan made an incredible progress, Taiwanese fund managers could not exhibit a good performance both in selectivity skills and market timing abilities. Jensen (1968) alph as indicated that over this period fund managers did not have selective ability, only 1 of the 15 funds had statistically significant positive alpha. Furthermore, Treynor and Mazuy (1966) and Henriksson and Merton (1981) regression analysis show that over the same period fund managers did not also have market timing ability, as none of the 15 funds had statistically significant positive coefficients. It can be deduced that Taiwanese fund managers had neither selective ability nor market timing ability during the quantitative easing era. At the end of this study, along with the outcomes, it is observed similarities with the results of earlier studies in literature. Future studies should expand upon these findings using persistence analysis.

References

Amadeo, K. (2015, February 1). What is quantitative easing? Definition and explanation. *About News.* Retrieved September 30, 2015 from http://useconomy.about.com/od/glossary/g/Quantitative-Easing.htm.

Cesari, R., & Panetta, F. (2002). The performance of Italian equity funds. *Journal of Banking and Finance,* 26(1), 99-126.

Chang, E., & Lewellen, W. (1984). Market timing and mutual funds investment performance. *Journal of Business,* 57(1), 57-72.

Chen, D., Gan. C., & Hu, B. (2013). An empirical study of mutual funds performance in China. *Social Science Research Network.* Available at SSRN: http://ssrn.com/abstrat=2220323.

Christensen, M. (2005). Danish mutual fund performance; Selectivity, market timing and persistence. *Aarhus School of Business, Finance Research Group Working Paper No. F-2005-1.* Available at SSRN :http://ssrn.com/abstract=670701

Dahlquist, M., Engström, S., & Söderlind, P. (2000). Performance and characteristics of Swedish mutual funds. *Journal of Financial and Quantitative Analysis,* 35, 409-423.

Deepak, A. (2011). Measuring performance of Indian mutual funds. *Finance India.* Available at SSRN: http://ssrn.com/abstract=1311761.

Detzler, M.L. (1999). Performance of global bond mutual funds. *Journal of Banking & Finance,* 23(8), 1195-1217.

Duggimpudi R.R., Abdou, H.A., & Zaki, M. (2010). An investigation of equity diversified mutual funds: The case of Indian market. *Investment Management and Financial Innovations,* 7(4), 77-84.

Gallo, J.G., & Swanson, P.E. (1996). Comparative measures of performance for U.S.–based international equity mutual funds. *Journal of Banking & Finance,* 20(10), 1635-1650.

Henriksson, R.D. (1984). Market timing and mutual fund performance: An empirical investigation. *Journal of Business,* 57(1), 73-96.

Henriksson, R.D., & Merton, R.C. (1981). On market timing and investment performance. II. Statistical procedures for evaluating forecasting skills. *The Journal of Business,* 54(4), 513-533.

Hsu, L. C., Ou, S. L., Yang, C. C., & Ou, Y. C. (2012). How to choose mutual funds that perform well? Evidence from Taiwan. International *Journal of Economics and Finance,* 4(1), 247-259.

Hou, T.C.T. (2012). Return persistence and investment timing decisions in Taiwanese domestic equity mutual funds. *Managerial Finance,* 38(9), 873-891.

Jensen, M.C. (1968). The performance of mutual funds in the period 1945-1964. *Journal of Finance,* 23(2), 389-416.

Koulis, A., Beneki, C., Adam, M., & Botsaris, C. (2011). An assessment of the performance of Greek mutual equity funds selectivity and market timing. *Applied Mathematics Sciences,* 5(4), 159-171.

Malkiel, B.G. (1995). Returns from investing in equity funds: 1971-1991. *Journal of Finance,* 50(2), 549-572.

Mayo, H.B. (2010). *Investment: An Introduction (10th Edition).* South-Western Cengage Learning, Mason, USA.

Noulas, G., Papanastatiou, J. A., & Lazaridis, J. (2005). Performance of mutual funds. *Managerial Finance,* 31(2), 101-112.

Rao, D.N. (2006). Investment styles and performance of equity mutual funds in India. Social *Sciences Research Network.* Available at SSRN: http://ssrn.com/abstract=922595 or http://dx.doi.org/10.2139/ssrn.922595.

Sharpe, W.F. (1966). Mutual fund performance. *The Journal of Business,* 39(1), 119-138.

SITCA fund information Taiwanese funds. (2015, February 2015). Retrieved September 30, 2015 from http://www.sitca.org.tw/ENG/FundInf/FI2001.aspx?PGMID=FI2001.

Treynor, J.L. (1965). How to rate management of investment funds. *Harvard Business Review.* 43(1), 63-75.

Treynor, J.L., & Mazuy, K.K. (1966). Can mutual funds outguess the market? *Harvard Business Review,* 44, 131-136.