Title: The Financial Standing and Attractiveness of New Zealand

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The Financial Standing and Attractiveness of New Zealand

Financial Economics

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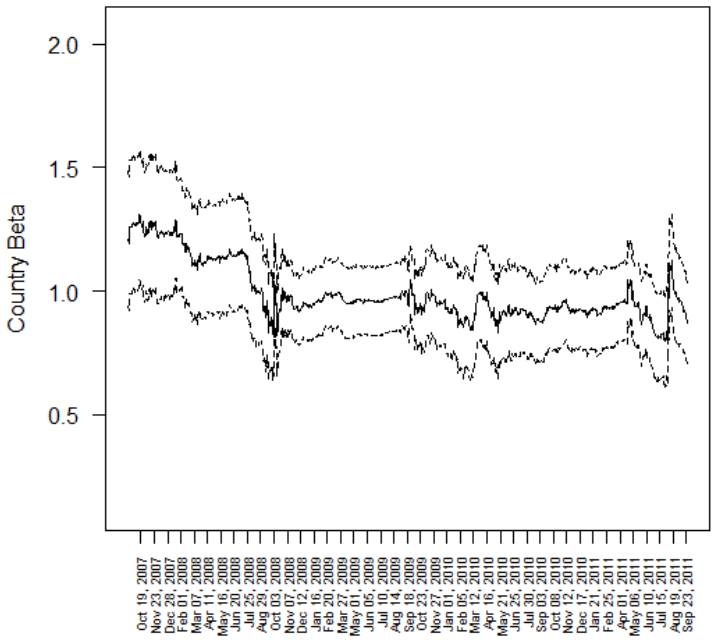
This paper aims to analyze the investment opportunity in New Zealand in term of risk and risk-adjusted profit associated with the New Zealand's economic condition. The paper technically focuses on the estimation of the rolling Scholes-William (1977) alphas and betas of New Zealand relative to a global index. The paper will also estimate the univariate Generalized Auto-Regressive Conditional Heteroskedasticity (Garch) of New Zealand relative to the global index for more robustness in the result.

Part 1. Scholes-William Estimators

The aim of this particular method is obtain the betas and alphas of New Zealand relative to the global index as well as estimate the standard error associated with the alphas and betas. Beta is defined as a measurement of risk added to the global investment from additional dollar invested in a country, and alpha can be defined as a measurement of the performance of the country relative to average global investment after adjusted from global systematic risk (Miller, 2006). We commence by estimating the logged return of the country and the global index return. In order to construct the beta for the country we need to obtain four regressions in Scholes-William estimator: rolling lagged regression, rolling contemporaneous regression, rolling leading regression and rolling market portfolio autocorrelation coefficients (the outputs can be found in the statistical summary). By calculating the betas, the alphas can be constructed by calculating the rolling mean of country's index returns and global index return. To look at the efficiency of the model we need to further estimate the standard errors correspond with the betas and alphas. To calculate the standard errors we need to estimate the rolling residual variance and the rolling residual autocorrelation coefficient of the country. Further inputs are needed to construct the standard error: the vector of sum of lagged contemporaneous and daily market return, the rolling autocorrelation coefficients, daily return of rolling beta against the sum of lagged contemporaneous and leading return. After acquiring all the needed regressions, the betas and 95% confidence interval can be constructed. The alphas and 95% confidence interval also can be constructed from the betas. The figures below display the betas and alphas of New Zealand. The aim of the model is obtain the beta and alpha in which allow investors to make rational decision whether to sell or buy asset in term of economics conditions as well as the profit opportunities within any particular country.

Daily, Rolling, Country Betas for New Zealand

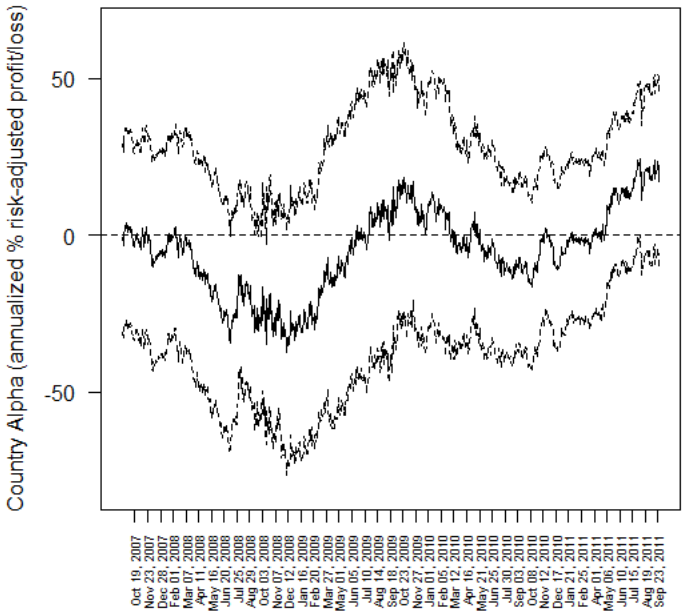
9/29/2006-09/28/2011



As depicting from the graph, we can see that betas as the sensitivity test of elasticity of country's index to change in global index. In late 2007, we can see that the betas are positive and higher than one, thus proving that during the subprime mortgage crisis, New Zealand is riskier than the average investment opportunities around the world. However, the crisis have subsided and New Zealand's alphas, on average, are positive and slightly one thus indicating that the risk of the country is similar (2009) or slightly lower (2010) to others country around the world relative to the global index (benchmark). There are two sharp drops in beta in late 2008 and middle of 2011, thus showing that New Zealand has reputed to a safe country, however, there are slight increase in the middle 2011 where the betas climb above one thus showing that the risk in investment increase relative to the global index. The risk of a country changes over time. The mean of the betas is around 0.9930 so it is somewhat still as risky as global index, however, during the current European crisis, many other European countries may be performing worst than New Zealand (more data needed). We can conclude that the New Zealander market is generally efficient. If we look at the standard error we can see that they are generally above zero in lower (0.06) and upper band (0.13). Hence proving statistically significant that investors have more opportunities to gain more profit. The daily data is more susceptible to over-estimate in term of market performance especially when used to estimate betas.

Daily, Rolling, Country Alphas for New Zealand

9/29/2006-09/28/2011

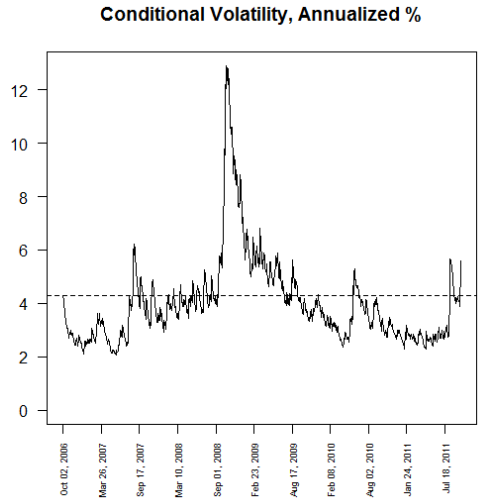


As seen from the graph, the alpha measures the average profit or loss of the country's performances. Pre-subprime mortgage crisis there is generally zero profit opportunity so there is little arbitrage opportunities (more data required), however, during the subprime mortgage crisis, New Zealand is affected because the alphas are generally negative, in which means that there are generally loss in financial market. Thus investors lose from investing more in the country relative to the global market opportunities hence investor should sell their shares of portfolio until the asset prices fall to the point where the losses disappear. The alphas seems to pick in late 2009 where the graph show positive recovery, however, the trend goes down again in the middle of 2010 in which may be due to the expectation of the Greek debt default crisis. In early 2011, the alphas pick up again thus showing positive profit hence investors make general gain per additional investment. So investors should buy more shares of the portfolio until the rise of the asset prices will flatten the profit margin. The general positive trend may be due to the migration of investors from European nations to safer country in term of financial institution like New Zealand. Looking at the standard errors of alphas, we can see a positive coefficients (0.11, 0.24), however, the alphas are a mixture of positive and negative coefficient thus we can conclude that during the subprime mortgage crisis investors were pressured to see, however, recently and in 2009 investors have being buying because it is rational to continue investing in New Zealand especially during this uncertain period. Thus alphas are a better measurement of country performance relative to betas as a proxy of net capital inflow because alpha takes account of adjusted systematic risks (Miller, 2006).

Part 2

GARCH is used to measure the inverse relationship of price and volatility. E.g. if a country's index return falls then volatility increases thus the risk of the investment in particular country is rising as well. But volatility changes over time thus we need to take account of heteroskedasticity.

New Zealand's Index Conditional Volatility (GARCH)



MU	AR1	MA1	OMEGA	ALPHA	BETA	SHAPE
0.160318576	0.042908141	-0.003823025	0.152201382	0.069698336	0.924164857	8.983953

Autoregressive term and moving average term are not closed to one thus the autoregressive term does not indicate any long memory. But the sum of alpha (ARCH) and beta (GARCH) are closed to 1 thus indicating long memory in the volatility. So a better estimation such as FIGARCH (Fractionally Integrated GARCH Model) should be implemented.

Test			Statistic	P-value
Ljung-Box Test	R	Q (10)	7.390152	0.6881698
Ljung-Box Test	R	Q (15)	12.224	0.6620012
Ljung-Box Test	R	Q (20)	14.21722	0.8193137
Ljung-Box Test	R^2	Q (10)	17.84552	0.0576261
Ljung-Box Test	R^2	Q (15)	27.43962	0.025352
Ljung-Box Test	R^2	Q (20)	31.96626	0.04365921

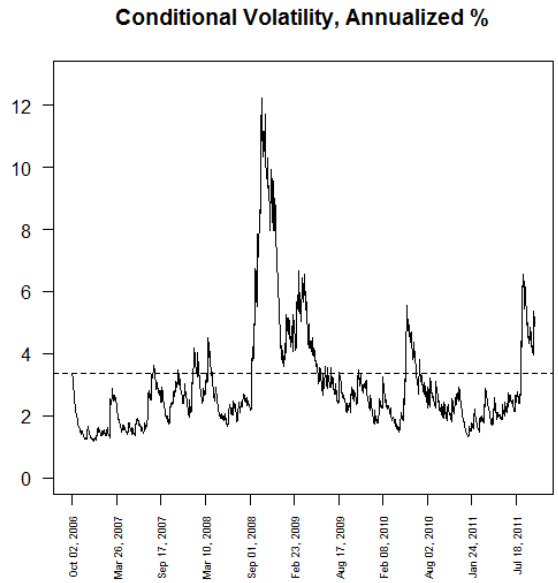
H_0: Random residuals

H_1: Non random residual

If the alpha is set at 0.07 then in accordance to Ljung-Box Test we can assume that null hypothesis cannot be rejected because P-values are generally greater.

In accordance to graph we see the volatility spiked during the subprime mortgage crisis thus the asset prices and country's index return should drop significantly. Investors should be pressured to sell shares of theirs portfolio to offset the losses thus we can conclude that the residuals are random

World Index's Conditional Volatility (GARCH)



MU	AR	MA	OMEGA	ALPHA	BETA	SHAPE
0.195110	-0.044421	0.203211	0.086736	0.114742	0.886970	6.099911

The autoregressive term and the moving average term are not closed to one thus the auto regressive term does not indicate long memory. But the sum of alpha (ARCH) and beta (GARCH) are closed to 1 thus indicating long memory in the volatility. So a better estimation such as FIGARCH should be implemented.

Test			Statistic	P-value
Ljung-Box Test	R	Q (10)	6.28948	0.7903843
Ljung-Box Test	R	Q (15)	8.582513	0.8983161
Ljung-Box Test	R	Q (20)	15.3561	0.755682
Ljung-Box Test	R^2	Q (10)	15.73975	0.1073286
Ljung-Box Test	R^2	Q (15)	17.91371	0.2672294
Ljung-Box Test	R^2	Q (20)	21.03211	0.3952449

H_0: Random residuals

H_1: Non random residual

If the alpha = 0.12 then in accordance to Ljung-Box Test we can assume that we would fail to reject the null hypothesis if the P-values are greater than the alpha then we can conclude that the residuals are random

In accordance to graph we see the volatility spiked during the subprime mortgage crisis thus the asset prices and global index return should drop significantly. Investors should be pressured to sell shares of theirs portfolio to offset the losses.

We can assume that New Zealand, as other developed countries, was affected by subprime mortgage thus experiencing sharper drop in asset price and return relative to global index. But after the crisis New Zealand has more or less experiencing the standardized volatility. Thus in accordance to Scholes-William model and GARCH we can see that the profit opportunities in New Zealand is still exist thus investors should migrate their shares of portfolio to New Zealand, especially those whom are going to be affected severely from the emerging European crisis and searching for a country as insurance or performing at the market level.

Reference:

Miller, S. M. (2006). How the Global Investors Might Rid Themselves of Asian-Type Crises. *Cato Journal*, 26(1), p.89-101.