

# Analysis of financial network and the role of asymmetry in stock and fund returns

## Abstract

Research focuses on three different topics about stocks, stock markets and funds. First study is about the effect of financial network on equity markets and analysis are based on three different investment flows. The geographical importance of the markets have been thoroughly analyzed in previous studies and found that home bias as well as uncertainty related to foreign markets led investors to focus on domestic markets. However, due to the interconnectedness of economies in today's world, the high priority of domestic investment decreased and international portfolio investments increased. Our study investigated the significance of the economy's position in financial network and compared with spatial effect. Based on empirical results from spatial autoregressive (SAR) model, we found the spatial effect to be statistically significant to explain index rate of returns together with economy's centrality on the debt based financial flows.

Moreover, Jensen's Alpha is studied by employing a skew-symmetric model for error terms. Jensen's  $\alpha$  has been the core quantity in the empirical test for CAPM (Capital Asset Pricing Model). CAPM states that expected excess rate of return of stocks and portfolio is equal to  $\beta$  times expected excess return of Market portfolio. But Jensen's  $\alpha$  is an additional expected excess rate of return of stocks and portfolio,

$$E[R_p - r_f] = \alpha + \beta E[R_m - r_f]$$

where  $R_p$  is rate of return of portfolio,  $R_m$  is that of market portfolio and  $r_f$  is risk free rate.

It has been popular to estimate  $\alpha$  by OLS(Ordinary Least Squares) method.  $\alpha$  is the intercept and  $\beta$  is the regression coefficient in a simple linear model. Our approach uses estimates of  $\beta$  based on Rank statistics which is known to be robust against outliers or heavy tail. Moreover, research analyzes  $\alpha$  in a new statistical model (Generalized Lehmann's Alternative Model, (Miura and Tsukahara, 1993)) that describes  $\alpha$  and error terms together. GLAM is semi-parametric and assumes  $F$  (underlying distribution) to be symmetric around zero and to be unknown. OLS method estimates  $\alpha$  and  $\beta$  simultaneously. But rank statistics method estimates  $\beta$  only in the first stage, then use the observed residuals to estimate location parameter and asymmetry parameters. Our main result is that Jensen's  $\alpha$  is a sum of location (of error terms) and asymmetry ( $\theta$ ) effect. Moreover,  $\theta$  is found to be related to volatility index and quarterly index rate of return.

Last research focuses on manager performance evaluation based on Unit Trust data. A surge in a number and types of investment funds attracted a great deal of attention by researchers to evaluate manager and fund performance. However, literature lack of studies with an application of robust methods but OLS. OLS is found to be imprecise when data has outliers and can lead to different results as our previous study found for the case of stock rate of returns. By focusing on monthly data from 1970 until 2015, performance (regression  $\alpha$ ) evaluated based on non-parametric rank statistics (R) and OLS. R estimates are found to be more efficient than OLS counterpart for most of the periods. To separate R estimate of alpha based on manager skill alone, a cross sectional bootstrap method is used. Observed  $\eta_i$  ( $\alpha$  included residuals) are further analyzed by fitting Generalized Lehmann's Alternative Model to obtain parameters for

asymmetry and location. By looking at performance persistence, research found that alpha due to manager skill persists together with asymmetry for long horizon. This study clearly shows that skill of the manager and portfolio allocation of fund is reflected in asymmetry of residuals ( $\eta_i$ ) from the regression which is used to evaluate the performance.