

DIFFERENT DOWNSIDE RISK APPROACHES IN PORTFOLIO OPTIMISATION

(Pendekatan Risiko Menurun yang Berlainan dalam Pengoptimuman Portfolio)

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ABSTRACT

Variance is commonly used as risk measure in portfolio optimisation to find the trade-off between the risk and return. Investors wish to minimise the risk at the given level of return. However, the mean-variance model has been criticised because of its limitations. The mean-variance model strictly relies on the assumptions that the assets returns are normally distributed and investor has quadratic utility function. This model will become inadequate when these assumptions are violated. Besides, variance not only penalises the downside deviation but also the upside deviation. Variance does not match investor's perception towards risk because upside deviation is desirable for investors. Therefore, downside risk measures such as semi-variance, below target risk and conditional value at risk have been proposed to overcome the deficiencies of variance as risk measure. These downside risk measures have better theoretical properties than variance because they are not restricted to normal distribution and quadratic utility function. The downside risk measures focus on return below a specified target return which better match investor's perception towards risk. The objective of this paper is to compare the optimal portfolio composition and performance using variance, semi-variance, below target risk and conditional value at risk as risk measure.

Keywords: Portfolio optimisation; variance; downside risk

ABSTRAK

Varians merupakan ukuran risiko yang biasa digunakan dalam pengoptimuman portfolio untuk mendapatkan penggantian di antara risiko dengan pulangan. Pelabur ingin meminimumkan risiko pada kadar pulangan tertentu. Namun begitu, model min-varians dikritik disebabkan oleh kekangannya. Model min-varians adalah sangat bergantung pada andaian bahawa pulangan aset bertaburan normal dan pelabur mempunyai fungsi utiliti kuadratik. Model ini menjadi tidak sesuai jika kedua-dua andaian tidak dipatuhi. Selain itu, varians bukan sahaja mendenda sisihan bawah tetapi juga sisihan atas. Varians tidak sepadan dengan persepsi pelabur terhadap risiko kerana sisihan atas adalah diingini oleh pelabur. Oleh itu, ukuran risiko menurun seperti semi-varians, risiko bawah sasaran dan nilai berisiko telah dicadangkan untuk mengatasi kekurangan varians sebagai ukuran risiko. Ukuran risiko menurun ini mempunyai ciri-ciri teori yang lebih baik daripada varians kerana mereka tidak terbatas kepada taburan normal dan fungsi utiliti kuadratik. Ukuran risiko menurun yang fokus kepada pulangan di bawah sasaran yang ditetapkan lebih sepadan dengan persepsi pelabur terhadap risiko. Objektif kertas ini adalah untuk membandingkan komposisi dan prestasi portfolio optimum dengan menggunakan varians, semi-varians, risiko bawah sasaran dan nilai berisiko sebagai ukuran risiko.

Kata kunci: Pengoptimuman portfolio; varians; risiko menurun

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