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**MEASURING THE GENERALIZED ASSOCIATION BETWEEN  
FINANCIAL STATEMENTS AND SECURITY CHARACTERISTICS;  
A CANONICAL CORRELATION APPROACH**

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# MEASURING THE GENERALIZED ASSOCIATION BETWEEN FINANCIAL STATEMENTS AND SECURITY CHARACTERISTICS; A CANONICAL CORRELATION APPROACH

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Many studies have considered the association between a firm's financial ratios and its security characteristics measured by market-based ratios. One group of these studies has its focus on the association between a firm's accounting beta and its security market beta. Bowman (1979), for example, provides a theoretical analysis of a relationship between the firm's systematic risk (security market beta) and the firm's accounting beta while e.g. Ismail and Kim (1989) present empirical evidence on the association. These results point to a relationship between a firm's risk related to the financial variables and security characteristics which is the subject of this paper.

Many researchers, Martikainen (1990) among others, have sought to establish which single financial ratios, or cluster (factor) of ratios best correlate with a security's return and risk. This approach implicitly assumes that the market's evaluation of a firm's performance and financial standing is based on an unvarying set of financial ratios. For example Martikainen (1990) uses profitability, financial leverage, operating leverage, and growth to explain in turn the firm's security price, return, and risk.

We shall extend the earlier results by taking a more generalized approach to the question of the association. Our first question is whether there is a general correlation between financial ratios and security characteristics. To tackle this question we apply canonical correlation analysis on a cross section of (accrual-based and cash-based) financial ratios and security information of 32 publicly traded Finnish companies for 1974-84. Our results confirm that security return and risk are strongly associated to financial ratios, but that the set of best predicting ratios varies with time.

Many researchers have investigated whether cash-based financial ratios behave differently from accrual-based ratios, and whether they contain more relevant information for security investment decisions than the accrual-based figures. The general contention in these studies has been that cash-flows have significant incremental information for the decision maker. For example Ismail and Kim (1989) came to the conclusion that cash-flow data has the potential of supplying additional information on a firm's risk beyond that available from earnings. These results give rise to our second research question whether the cash-based financial ratios or the accrual-based financial ratios have a stronger relation with security characteristics. Our results do not corroborate a view that the cash-flow information would have more relevance than the accrual-based figures (rather vice versa).

A consequent question invoked by the above result and the earlier research is whether the cash-based information still is incrementally significant for a relationship between financial ratios and security characteristics. Our empirical results do not corroborate the view that the cash-flows impart decisive incremental information for security evaluation.

It is commonly believed that investors use only a few key factors in their evaluation of a firm's performance and financial standing. Our third major research question is whether the generalized association between the financial ratios and the security characteristics still holds for a reduced set of accrual based financial ratios. Our empirical results conform to the view of a few key factors being sufficient. The adjusted strength of the observed correlation between the reduced set and the security characteristics is over par with the non-reduced set of financial ratios.

Studies based on different factor analysis methods represent a strong tradition of research in financial statement analysis striving to reduce a large number of financial ratios into a smaller number of mutually exclusive categories covering the various aspects of the firm's activities, see for example Virtanen and Yli-Olli (1989). The implication for our study is that the information content of the financial ratios is portrayed by a limited set of key ratios, and we shall consequently look into the correlation between this set and the security characteristics.

Fama and MacBeth (1973) indicated that, in the Security Market Line (SML) form of Capital Asset Pricing Model (CAPM), two parameters of returns, i.e. mean and beta-risk, are the sufficient statistics to define the properties of a security. This means that the higher moments of the returns may not be relevant to the decision maker. Thus, our last research question is whether the observed mean returns and betas are adequate, or whether the empirical relation between financial ratios and security characteristics is strengthened by the inclusion of the higher moments of security returns. Our empirical results indicate that inclusion of the higher moments does not strengthen the empirical association, and thus corroborate the SML form of CAPM.

## RESUMÉ

### **Mesurer la relation générale entre les caractéristiques du compte de résultats et des valeurs mobilières: étude de corrélation canonique**

Une forte dépendance entre les ratios financiers des firmes et leurs caractéristiques de valeurs immobilières ressort quand on emploie une analyse de corrélation canonique au lieu d'essayer de mesurer les dépendances volatiles entre les variables individuelles. Les données de 32 firmes entre 1974 et 1984 forment l'échantillon qui permet de constater que les ratios clefs de dépendance varient avec le temps. Puis, on peut dire que les ratios de la marge cumulée influencent plus les caractéristiques de valeurs immobilières que les ratios de la marge brute d'autofinancement (cash flow). Les ratios de la marge brute d'autofinancement ont cependant de l'importance. Pour établir une dépendance entre les ratios financiers et les caractéristiques de valeurs immobilières, il suffit d'un nombre limité de ratios clefs variant avec le temps. Enfin, en définissant les caractéristiques de valeurs immobilières, on peut constater que l'observation du rapport attendu et du bêta suffit. Les moments plus élevés n'ont pas d'importance.

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