Liquidity Efficiency in the Greek Listed Firms: A Financial Ratio Based on Data Envelopment Analysis

Ioannis Dokas, Department of Economics, National and Kapodistrian University of Athens, Athens, Greece
Dimitris Giokas, Department of Economics, National and Kapodistrian University of Athens, Athens, Greece
Anastasios Tsamis, Department of Public Administration, Panteion University of Social and Political Sciences, Athens, Greece

ABSTRACT

The scope of this paper is to investigate the liquidity efficiency of the Food and Beverage listed firms in the Athens Exchange, for the period 2006-2009, following a two stage analysis. In the first stage, Data Envelopment Analysis is employed to estimate liquidity efficiency for each firm of the sample. The results are consistent with the equivalent findings of the authors’ analysis with financial ratios for the same period. The DEA analysis is validated by ordinary least squares (OLS) and the results prove that the regression equation can be used to evaluate a new liquidity efficiency for the firms of the specific sector. In the second stage of the analysis a Tobit regression model is applied in order to identify determinants of firms’ liquidity efficiency. According to the authors’ findings, a number of firms operating factors, like financial leverage, operating cost, firm size and Return on Equity to Return on Total Assets, have a significant impact on liquidity efficiency. In addition, the results of the Tobit regression model confirm the assumptions which are related to the links and their signs between liquidity efficiency and the aforementioned variables.

Keywords: Corporate Liquidity, Data Envelopment Analysis (DEA), Financial Ratios, Liquidity Efficiency Score, Tobit Regression

1. INTRODUCTION

Corporate liquidity concerns a significant scientific field of the empirical economic and financial research. More specifically, liquidity concerns a key measure of firms’ viability, since it describes their ability to meet their obligations. When the liquidation of current assets satisfies the short – term liabilities, the firm’s management is considered efficient. In current assets, specific accounting components can be found, such as inventories, receivables, and marketable securities as well as cash holdings. Theoretically speaking, the decision on the structure of current assets depends on various factors like the size of the firms, the bounds of external financing,
the credit policy, the solvency level, the place of the firm in the market, the profitability of capital employed, the return on equity and, last but not least, the access to the capital market. In literature, numerous research studies have been developed in order to describe the framework of liquidity policy. Servaes and Tufano (2006) supported that firms hold strategic cash as a general buffer against cash flow shortfalls, but they also indicated that low cash levels are a sign of efficient management. In addition, Kim et al. (1998) supported that the optimal point of liquidity is determined by a tradeoff between the low return earned on liquid assets and the benefit of minimizing the borrowing cost. Opler et al. (1999) provided the opinion that firms with strong growth abilities and riskier cash flows hold high ratios of cash to/ total non-cash assets. As far as the listed firms with high access to the capital markets are concerned, they tend to hold lower ratios of cash to total non-cash assets. Denis (2011) discussed crucial topics on liquidity management such as the determinants of cash holdings, the sensitivity of cash holdings to corporate cash flow, the value of cash holdings and the real effects of differences on corporate liquidity. Papaioannou et al. (1992) analyzed the relationship between corporate liquidity and ownership structure. One of the basic functions of their model is the control of liquidity in relation to the operating needs of the firm. Ippolito and Perez (2011) introduced the existence of a substitution relation between cash and undrawn credit in their research.

Summarizing these findings, it is understood that liquidity is a multidimensional research topic, which still remains among the unsolved problems in the field of finance. The effective management of liquidity enhances the financial flexibility of the firms especially in periods when the economic environment is vulnerable. This efficiency eliminates the basic liquidity risk that stems from the situation of technical insolvency. However, all the decisions relevant to the assets management are taken under uncertain conditions. These theoretical approaches attempt to decode the special characteristics of corporate liquidity, and describe the theoretical framework of effective liquidity policy.

The financial statements offer all the essential accounting components, aiming to analyze the liquidity status of the firms. The basic tool of this process is the financial statement analysis with the use of financial ratios. The grouping of financial ratios is based on the purposes of the analysis, according to the financial fields that are investigated. Consequently, a number of liquidity ratios that offer estimations relevant to the liquidity score of firms are available. Also, the theory of ratio analysis permits the combination of various ratios in order to improve the reliability of their estimations. The values of ratios concern the basic financial data which have been used in the development of corporate failure prediction models during the last five decades. Their distributional properties were the basic cause for the introduction of the non-parametric methods in this research area, such as Data Envelopment Analysis (DEA), Artificial Neural Networks (ANNs) etc. Applications of these methods have been developed in various financial topics, such as the estimation of corporate performance while numerous studies have considered specifically the issue of corporate failure prediction models. In the current study we use the methodology of DEA (Charnes et al., 1978) in order to construct efficiency frontiers and evaluate the relative efficiency of decision-making units (in our case firms).

The literature review reveals, to our knowledge, that to date there are no published papers analyzing corporate liquidity efficiency using DEA. This methodology has not been extensively applied in the context of financial analysis yet. Moreover, the literature reveals that there are no publications that specifically analyze the liquidity efficiency of Food and Beverage firms in Greece. The data which is used cover the period 2006-2009 because the main scope of the analysis was to investigate the stability and the status of the liquidity management in the case of Greek listed firms under the normal economic conditions. Also using data from firms which are classified in the same sector, we attempt to provide some conclusions.
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