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A variable impact neural network analysis of dividend policies and share prices of transportation and related companies

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ABSTRACT

The purpose of this research is to investigate dividend policy, including its impact on share prices of transportation providers and related service companies, by comparing generalized regression neural networks with conventional regressions. Our results using regressions reveal that for Europe and for the US and Canada the market-to-book-value, as a surrogate for growth opportunities, fulfils expectations of pressures on dividends leading to a negative association with dividend yields in accordance with the pecking order theory. Neural network analysis indicates a clear role for growth opportunities for the US and Canada pointing to an underlying confidence on the part of transportation companies in their own internal policies. Finally, risk is rewarded especially in Europe.

1. Introduction

What do shareholders of transportation companies get for their money? How do dividends impinge on their share prices? Do dividends play a stronger role than retained profits in valuing these companies? These are important questions for the transportation industry, and need to be addressed. If share prices in this sector appreciate, then investors find that their returns comprise capital gains as well as

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dividends. Of course, if prices fall, capital losses ensue instead. But capital gains or losses are likely to be more volatile than dividends. Indeed, performance of global transportation firms is closely linked to variations in world trade (Goulielmos and Psifia, 2006) and global macro factors (Kavussanos and Marcoulis, 2000, 2005; Grammenos and Arkoulis, 2002).

In view of such exposure to fluctuations in global trade, and differences in national economic cycles, good planning and appropriate strategic long-term decision-making are important (Bendall and Stent, 2003). Of course, dividends are paid out of earnings, leaving a residual for the retentions which become available for strategic reinvestment, and so whether dividends are more important than retentions is a key issue that may also affect the future of the transportation industry. In accounting terms retentions produce a change in accounting book values, and indeed it is upon the network assets of the enterprise that the companies can generate their returns. In using these network assets, there is evidence to suggest that the risk in terms of freight volatilities can be reduced by operating small-sized vessels (Kavussanos, 2003). But do share prices of transportation providers and related service firms duly reflect dividends, retentions, market and book values per share? If so, which elements are more significant in such valuations? These are some of the empirical issues, which this paper attempts to investigate.

Given the international nature of the transportation industry, it is sensible to take cognisance of variations amongst capital markets across the globe. Regarding the relative importance of dividends, retained profits, market and book values, do European transportation providers and related service firms differ from those in North America, the Far East and Australia? In the determination of share prices of these companies, if a clear role can be established for dividends, then the next step is clearly to evaluate the factors that drive dividend yields. In this paper, from a review of some of the literature on dividend policy, several factors will be proposed that are likely to be of potential importance to dividend yield determination. It emerges from our literature review that potentially significant contenders for such an investigation are growth prospects, asset backing, business and financial risks, size/stability, profitability, capital expenditure needs, and cash flow generation.

The aims of this research are to identify relevant variables, and to test the predictive abilities of the models used for determining both share prices and dividend yields of transportation companies which term we use to refer to transportation providers and related service companies. As far as share prices are concerned our focus is on whether dividends are more important than retentions. As far as dividend yields are concerned, we are more interested in identifying relevant variables, and assessing which of these are more important than others. Furthermore, we suspect that there may be some regional differences, and if so then investors should be aware of them. Also, we consider how far our results accord with various economic theories pertaining to dividend behaviour, such as pecking order, agency cost and trade-off theories.

We find that the book value per share is the most important determinant of the share price. The variable impact analysis of share price demonstrates that dividends are more important than retentions in each region and overall. Furthermore, the main drivers of dividend yields are different in the three regions: market-to-book-value in the US and Canada (negatively associated); risk in Europe (positively associated); and cash flow as a percentage of sales (negatively associated) in Rest of the World.

Within the literature, dividends play a more important role than retentions in explaining share prices, as evidenced in a UK study by Rees (1997), in the spirit of the Ohlson model (Ohlson, 1995) on the value relevance of accounting information. However, Gwilym et al. (2005) demonstrate that for the UK this is not true after the effects of transaction costs and risk have been taken into account. Barker (1999), from survey evidence, finds that analysts tend to use dividend yields in the utilities and financial sectors. Benartzi et al. (1997) investigate the information content of dividend policy pertaining to future earnings, following the classic investigation by Lintner (1956). They do not find an association between a current dividend increase and future earnings' growth. Grullon et al. (2005) find that dividend changes bear no information-content regarding future changes in earnings, after account is taken of non-linearities in earnings' behaviour. Riahi-Belkaoui and Picur (2001) argue that the use of the PE ratio or dividend yield will depend on the investment opportunity set open to the firm. Benito and Young (2003) found that UK firms with greater growth opportunities (higher Tobin's