Causal interrelations among market fundamentals: Evidence from the European Telecommunications sector

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ABSTRACT

This study investigates the interdependence of some major financial variables applied to several European Telecommunications institutions using a multivariate vector autoregressive (VAR) approach. In particular, this paper examines the bilateral relationships among market fundamental variables, such as stock returns, index returns, earnings, capital expenditures and interest rate, with respect to causality and impulse responses, for companies that play major role in their home stock markets. Unlike the fact that the selected Telecommunications companies have many similar characteristics, this research finds that only few of them support common behavior.

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1. Introduction

Earnings, stock returns and capital expenditures are some of the most important parameters in evaluating financial performance of a company. Of equal importance are the relationships among these variables that can determine to what extent one variable affects the behavior of another. Therefore, it is not surprising to find a lot of interesting research papers studying financial variables, not only with respect to their interrelations but also to what extent their magnitude reflects market and corporate activities. Indeed, identifying and understanding the cross effects between financial variables is a crucial issue to individual and institutional investors, to market analysts, to policy makers and also to corporate managers, since these variables determine their investing and planning decisions, their business performance, their forecasts and of course can help regulatory authorities in deciding their policy and their market reforms.

There is a substantial literature that examines how stock returns are affected by two different sets of factors, known as external and internal, as an effort to evaluate financial performance. As external factors are considered basic macroeconomic variables, such as interest rates, gross domestic product, inflation, exchange rates, monetary policy variables and market index returns, see for example Chen, Roll, and Roll (1986) and Lee (1992), whereas as internal factors are considered fundamental financial variables, such as earnings, capital expenditures and dividends, see for example Campbell and Shiller (1988) and Lee (1998). The objective in the first case is to analyze the behavior of stock returns based on the overall economic activity, whereas in the second case the research is focused on firm's fundamentals. Moreover, there is a broad notion that stock returns reflect expectations on current and future economic development, while at the same time stock returns reveal, at company's level, the capabilities of the organization to generate future cash flows.

Hence, this study aims to analyze the bilateral relationships of some basic financial variables obtained from several Telecommunications companies in Europe that normally play a major role in the overall economic activity of their country. Section 2 depicts some of the economic and financial key elements of the

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Telecommunications sector in Europe. Section 3 discusses market fundamentals with respect to the direction of their relationships, as presented in the literature, whereas, Section 4 outlines briefly the VAR methodology and concepts regarding Granger causality and impulse responses. Section 5 describes the variables used in this study and reports the empirical results. Finally, the concluding remarks are included in Section 6.

2. The European Telecommunications sector

The Telecommunications sector in Europe has changed drastically over the last decade. Due to the inefficiency and lack of performance, the Telecommunications industry had to be deregulated and become competitive, offering better quality of services at lower prices. The deregulation process, which is well described in Thatcher (1999) and Knorr (2002), forced the former state owned monopolistic companies to adjust their operations into the new competitive and well controlled by the regulatory authority environment. These companies have to pay now seriously attention to their financial performance so that funds can be drawn from the market to support their investment decisions. It is worthwhile to mention that these firms account for over 30% of the market capitalization in their home stock market and even greater total share trading volume, as Boutchkova and Megginson (2000) have indicated.

The liberalization process as well as the magnitude of these firms gave the incentive to several researchers to study the economic and the financial aspects of this industry. A large number of papers focused on regulatory regime issues, the competitive environment between companies, the need for privatization and the overall performance of these firms, see for example Laffont and Tirole (1993, 2000), Ros (1999), Boylaud and Nicoletti (2001), Wallsten (2001), Gual and Thrillas (2004) and Estache et al. (2006). Several other papers examined the existence of causality between investments in Telecoms and economic growth with some of them supporting the causal direction from Telecom investments to economic growth, see for example Madden and Savage (1998) and Datta and Agarwal (2004), whereas other suggesting a bidirectional relationship between the two variables, see for example Lee (1994), Yoo and Kwak (2004) and Yemane (2007). Finally, few other studies, such as Munoz and Amaral (1998), Wright (1999), Madden and Savage (2000), Agiakloglou and Yiannelis (2005) and Agiakloglou and Karkalakos (2009), have examined microeconomic aspects of this sector and have estimated price elasticities for international Telecommunications demand using different econometric approaches.

Nevertheless, the evolution of the Telecommunications sector gave the incentive to several researchers to study the performance of these firms mainly from the financial point of view. For example, Bortolotti, D' Souza, Fantini, and Megginson (2002) examined the financial and operating performance of 31 national Telecommunications companies that were fully or partially privatized and found that their performance improved significantly by the combination of regulatory changes and privatization, whereas Agiakloglou and Bloutsos (2011) studied the financial risk of several European Telecommunications companies and compared their estimates with the market risk obtained by their home countries.

Therefore, besides the challenge of empirically identifying economic behaviors at macro or micro economic level of Telecommunications companies, it is still very interesting to study their financial behavior based on their own fundamental variables, to evaluate their performance after the liberalization of the industry. Moreover, these variables can also be used on bilateral basis to study causal interrelations among them, as well as to determine how much each variable can affect or can be affected by others. In addition, the Telecommunications Market in Europe has a unique feature that all current dominant players in each country come from a former monopolistic regime controlled by their government, known as PTT (Post Telephone and Telegraphs) institutions. Hence, it is very interesting to examine the financial behavior of these companies that had and still have similar characteristics and to investigate whether any conclusion can be made with respect to their common behavior.

3. Market fundamentals

Over the last few years several studies have tried to examine the relationships between some market fundamentals on a bilateral basis. According to Lamont (1998), earnings, for example, have an explanatory power on expected future returns, due to the fact that earnings correlate with business conditions. Similarly, Lee (1998) has suggested that earnings are also correlated with dividends, indicating that half percent of the long run variation of stock returns is explained by dividends; whereas the short run variation of stock returns is explained better by other non fundamental components. The relationship between earnings and stock returns is also examined by Campbell and Shiller (1988) where they found that the prediction of stock returns is determined by the moving average of real earnings, especially when earnings are measured for several years. In this lieu, Fama and French (1988) have pointed out that earnings create noise among stock returns due to their volatility, while Lamont (1998) has indicated that this noise contains useful information about short term movements in stock returns.

Another important variable that affects stock returns is capital expenditures (CAPEX). According to McConnell and Muscarella (1985), on an average basis, announcements of increases in planned capital expenditures affect positively stock prices and *vice versa*. The positive relationship between capital expenditures and stock returns is also noticed by Titman et al. (2003) as they pointed out that the increased capital expenditures imply greater investment opportunities. On the other hand, Woolridge (1988) refers to a positive reaction of stock prices to a variety of strategic investment decisions, such as joint ventures, plant and equipment purchases and R&D expenditures, whereas Chung Kee, Wright, and Charoenwong (1998) support that stock prices are not only affected by the announcement of changes in capital expenditures, but also by the market's assessment on the quality of firms investment opportunity. Nevertheless, other studies support that changes in stock prices affect investment decisions in the context that an increase in stock prices will lead firms to increase their investments. For example, Andersen and Subbaraman (1996) pointed out that stock prices do cause investment something that has also been addressed in a more specific way by Doan et al. (1983) and Fischer and Merton (1984) in the sense that stock prices cause capital expenditures.

The relationship between investments and earnings is examined by Bar-Yosef, Callen, and Livnat (1987) concluding that earnings Granger cause investments, whereas McFetridge (1978) and Shapiro, Sims, and Hughes (1983) supported the opposite causality direction between those two variables. In this context, Amadi (2005) studied the relationship between operating income and capital expenditures, but could not uniquely identify the direction of causally between these two variables.

Interest rate is also an important variable determining not only the economic activity of a country but also the financial activity of a company. Bernanke and Blinder (1990) examined the effectiveness of monetary policy though interest rate changes using a VAR model containing four macroeconomics variables, such as money supply,