Review of Economics & Finance
Submitted on 23/07/2015
Article ID: 1923-7529-2016-01-27-16
Francesco Campanella, Mario Mustilli, and Eugenio D'Angelo

Efficient Market Hypothesis and Fundamental Analysis: An Empirical Test in the European Securities Market

Prof. ***Francesco Campanella*** (Correspondence author)
Department of Economics, Second University of Naples
Corso Gran Priorato di Malta, 1, Capua, Caserta, 81043, ITALY
Tel: 00390823274353, E-mail: francesco.campanella@unina2.it

Prof. ***Mario Mustilli*** [a)] Dr. ***Eugenio D'Angelo*** [b)]
Department of Economics, Second University of Naples
Corso Gran Priorato di Malta, 1, Capua, Caserta, 81043, ITALY
E-mail: a) mario.mustilli@unina2.it b) eugenio.dangelo@unina2.it

Abstract: This paper is to make a contribution to the empirical analysis of the efficient market hypothesis, specifically to appraise the potential of fundamental analysis as a predictor of abnormal returns following dividend announcements in European financial markets. The authors use a sample of 1,708 manufacturing and service businesses. The findings obtained are evidence that fundamental analysis does help predict abnormal returns, that the prediction model is barely influenced by the overall economic cycle and that the efficiency level of the European financial market is not of the semi-strong type. The misalignment observed between the market prices and fundamental values of securities may either be traced to the inability of investors to correctly interpret and use the information that is made available or, and even more probably, to the fact that economic agents adopt principles and procedures other than those recommended by traditional theorists. The findings have led to the emergence of behavioural finance, a discipline which emphasises the irrational conduct of many investors in financial markets, as well as their tendency to underrate the risks associated with given investments on the wrong assumption that events held to be associated with disclosed information will ultimately be averted.

Keywords: Information, Market efficiency, Fundamental analysis, European securities market, Abnormal returns, Dividend announcement

JEL Classifications: G14, G12, G15

1. Introduction

Kendall and Hill (1953) have demonstrated that trends in stock prices follow a random walk, i.e., that the price variations recorded in time are unrelated to each other. Using different methods, Samuelson (1965; 1998) found that price variations recorded today do not provide any indications concerning probable future price trends.

Within the framework of the debate on the comparative efficiency levels of fundamental versus technical analysis, Fama also reached conclusions that are consistent with the findings of the two authors just mentioned (Fama 1963; 1965; 1995; 1970).

Hence, there are reasons to argue that financial analysts bring grist to the random walk hypothesis irrespective of the analytical method they choose (fundamental or technical analysis).

Indeed, those using fundamental analysis try to predict the theoretical future price trend of a security by reference to the company's financial performance, but due to the competition between different traders using fundamental analysis techniques the prices will reflect the bulk of market-relevant information, which means that future price variations will be unrelated to the fundamental variables (Brealey et al., 2011).

In contrast, those opting for the technical analysis method survey the past price trends of the securities concerned and try to predict future trends based on the information thus obtained. Again, the competition between traders using technical analysis methods ensures that the current prices will reflect all the information on the relevant trends recorded in the past and the result is that future trends cannot be predicted based on past cycles.

As a result, in competitive and efficient markets stock prices develop in a random walk fashion since all relevant information is reflected in them and does not influence future trends.

Based on the extent to which new information is reflected in stock prices, Fama (1970) defined three market efficiency levels (termed weak-form, semi-strong and strong-form efficiency levels).

In a market of the weak-form efficiency type, current stock prices reflect all the information provided by the relevant stock price time series.

In contrast, in a market of the semi-strong-form efficiency type security prices reflect both the time series of past price variations and additional information made available to the public.

In a strongly efficient market, stock prices instantly reflect not only all such information as is made available to the general public, but also information available to insiders in firms. Consequently, in such a situation, expected returns above or below the opportunity cost of the capital estimated via the market model (i.e. the Capital Asset Pricing Model – CAPM) are ruled out. This means that in markets with a strong-form efficiency level each security is instantly traded at its fundamental level, as estimated at the current value of the future dividends assumed to accrue on it at a constant rate (Gordon and Shapiro, 1956).

Conversely, at less than strong-form efficiency levels the market price of a security will depart from its fundamental value for varying periods of time and investors will be able to make earnings above the cost of capital expected in the market. These are situations in which investors may earn abnormal returns provided they sell their securities when the market price is far above their fundamental value or buy them when it is perceived to be fairly low. Accordingly, abnormal returns can be defined as the part of the returns which is not generated by movements in the market (MacKinlay, 1997; Kothari and Warner, 2007; Brealey et al., 2011).

Event studies have shown that any information regarding events such as takeovers or dividend announcements is instantly reflected in the market prices of the assets concerned (Keown and Pinketon, 1981; Patell and Wolfson, 1984). This observation was confirmed by empirical surveys of the trends in abnormal returns recorded in the time-span immediately after a takeover, a dividend announcement or the disclosure of variations in bottomline results or the total cumulative abnormal returns recorded over the same period.

Techniques to measure the abnormal returns generated by a specific event (as mentioned before, the announcement of a dividend distribution or extraordinary business project) have been used to empirically validate the efficient market hypothesis theory in terms of establishing whether a given market is actually of the semi-strong efficiency type.

Other studies testing the semi-strong form efficiency assumption have measured the extent to which investment funds may outperform the market if they put to advantage the drift between the announcement of the event and the time it is reflected in the price of the security concerned (Malkiel, 1995; Kosowski et al., 2006).

In this connection, detractors of the efficiency market hypothesis such as Grossman and Stiglitz (1980) have argued that the substantial management costs that investment funds incur in their effort to collect data on listed enterprises is clear evidence that not all available information is in fact reflected in stock prices and that there must be information that can be retrieved in the market at a cost below the abnormal returns it potentially generates. As a result, particularly well informed investment fund managers expect to earn short-run extra-returns which they hold to be generated by information which is not yet reflected in stock prices.

Basically, most of the empirical findings of surveys intended to disprove the efficient market hypothesis try to prove that fundamental analysis outperforms it as a predictor of abnormal stock returns. Indeed, if the actual returns significantly depart from the expected level as estimated based on the market model, it will take some time before the stock prices will reflect the whole of the information made available to the public in consequence of the disclosure of balance sheet ratios or market multiples. As mentioned before, the slower the adjustment of market prices to new information, the higher the abnormal returns that traders will be able to cash.

Hence, portfolio strategies can be optimised by screening data which appear to predict returns above the market level. However, although many authors have reached the conclusion that institutional investors strive to cash abnormal returns by fleshing out prediction models, Roll has remarked that considering the substantial transactional costs incurred, he is forced to admit that he has never managed to outperform the real financial market (Roll, 1994).

This paper is part of the theoretical approach to the empirical analysis of the efficient market hypothesis and is designed to appraise the potential of fundamental analysis as a predictor of abnormal returns following dividend announcements in European financial markets (UK, Italy, Germany, Spain). In 1969, one of the earliest market efficiency tests conducted by Fama, Fisher, Jensen and Roll assessed the extent to which US stocks listed in the NYSE responded to corporate dividend announcements (Fama et al., 1969). According to these authors, dividend announcements and variations are particularly relevant items of news because they reveal the expectations of the management concerning the future financial performance of their companies. Ever since the appearance of their paper, this event study has been a reference point for all the researchers intending to assess the informational efficiency levels of financial markets.

This research is designed to establish the extent to which fundamental analysis is actually capable of predicting the abnormal returns several authors hold to be triggered by dividend announcements. In this connection, it is worth specifying that as the aim of this survey is to validate the semi-strong form of market efficiency, it uses information circulated among the general public, rather than the time series of price trends that would be suited to validate the weak-form market efficiency assumption (Brealey et al., 2011). The fact that specific events such as dividend announcements do trigger abnormal trends in stock returns demonstrates that the semi-strong form efficiency hypothesis is not verified.

This paper falls into five sections and an introduction. Section 2 reports published studies in support of the role that fundamental analysis is assumed to play in predicting abnormal returns. Section 3 states the authors' aims and research hypotheses. Section 4 describes the materials and methods adopted, section 5 reports and discusses the research findings obtained, while section 6 states the conclusions.

2. Literature Review

Over the past years, the crisis under way in Western countries has been responsible for the extremely volatile trends prevailing in financial markets. Within this overall situation, fundamental

analysis has been the primary tool used by financial market operators in assessing the value generated by listed companies.

It is well known that the aim of fundamental analysis is to define ideal portfolio strategies through the use of indicators, both microeconomic (balance sheet ratios, forecast-based intrinsic value estimates, market multiples) and macroeconomic (GDP, inflation).

One of the issues with which specialists have long striven to come to terms within the framework of empirical tests designed to validate the semi-strong market efficiency hypothesis is the ability of these indicators to predict stock market trends and, specifically, abnormal returns.

In this connection, some researchers have emphasised the extent to which share returns as well as the market prices of securities are influenced by balance sheet ratios (Basu, 1977; Roenfeldt and Cooley, 1978; Ou and Penman, 1989; Martikainen, 1989; Salmi et al., 1997; Anthony and Ramesh, 1992; Lev and Thiagarajan, 1993; Abarbanell and Bushee, 1997, 1998; Dowen, 2001; Edirisinghe and Zhang, 2007; Richardson et al., 2010; Dainelli and Visconti, 2014).

In contrast, other researchers have prioritised the role of market multiples as major drivers of share prices and returns (Basu, 1975, 1977, 1983; Fama and French, 1992).

Major analyses of balance sheet ratios include a study dating from the late 1980s in which Ou and Penman (1989) provided evidence of the influence of these ratios on share returns.

In 1993, Lev and Thiagarajan identified a dozen balance sheet ratios (inventory, accounts receivable, capital expenditure, research and development, gross margin, sales and administrative expenses, provision for doubtful receivables, effective tax, order backlog, labour force, last-in-first-out (LIFO) earnings and audit qualification) which are held to impact share returns and may help a trader choose the ideal portfolio strategy. At the same time, they offered evidence that the relation between balance sheet ratios and share returns is mainly dependent on three macroeconomic variables (consumers' price index, real gross national product, the level of business inventory) and, consequently, underscored the relevance of ‘contextual capital market analysis’. Their assumption was supported by the research findings of Abarbanell and Bushee (1998). Some years later, Dowen (2001) fine-tuned the share return prediction models of Abarbanell and Bushee (1997) by introducing additional data (dividend yield, firm size and book-to-market value of equity ratio) and further developed the ‘contextual capital market analysis’ approach by emphasising the role that the ‘monetary policy’ variable plays in these models.

Turning to Europe, a recent survey by Dainelli and Visconti (2014) has highlighted a link between five balance sheet ratios (Cash Dividend Coverage; Retention Ratio; ROE; Current Ratio; Quick ratio) and the market performance of the shares of the companies concerned.

In a 2006 survey designed to appraise the performance level of fundamental analysis in the Italian financial market, Alesii concluded that a long-term approach did offer evidence that the price-to-book ratio helped predict share returns (Alesii 2006) and that this finding proved the applicability of the semi-strong form of market efficiency hypothesis to the Italian market. The same conclusion was reached by Murgia (1990) in an event study which pointed to a positive response of the market to the announcement of higher dividends and, conversely, a negative response to the announcement of a dividend cut.

In point of fact, other authors reached antithetical conclusions. Specifically, a survey by Bajo and Petracci revealed abnormal returns in the three-year period after the release of the information that the majority shareholders of a company had modified their stakes in the company (Bajo and Petracci, 2006). Elsewhere, Bajo showed that abnormal returns could be obtained using a trading strategy with focus on unusually large trading volumes that could not be traced to the circulation of new information (Bajo, 2010). A comparable survey was performed in Sweden (Skogsvik, 2008).

Additional share return prediction models have been created by Asian and South American researchers. Specifically, researches in Korea have shown that the independent book-to-market and debt-equity variables are positively related to a dependent variable such as stock returns (Mukherji et al., 1997). In Mexico, Swanson, Rees and Juarez-Valdes (2003) used Lev and Thiagarajan's analytical model to highlight the influence of inflation on the financial market of that country.

Turning to surveys intended to highlight the effects of information included in market multiples on share returns, an analysis conducted by Basu in the late 1970s (Basu, 1977) showed the 'low P/E effect' (Basu, 1977; Kelly et al., 2008). Basu concluded that *".....P/E ratio information was not 'fully reflected' in security prices in as rapid a manner as postulated by the semi-strong form of the efficient market hypothesis."* (Basu, 1977).

The low P/E effect is dealt with in additional researches on US stocks conducted at different points in time (Jaffe et al., 1989; Goodman and Peavy, 1986; Fama and French, 1992; Fuller et al., 1993; Dreman and Berry, 1995).

There is evidence that the P/E effect is a component of the portfolio strategies adopted in countries such as the UK, Japan, Taiwan, France, Germany, the Netherlands, Italy and Australia. Most surveys indicate that low P/E ratio strategies generate more or less positive abnormal returns in a variety of countries (Levis, 1989; Aggarwal et al., 1990; Chou and Johnson, 1990; Chan et al., 1991; Brouwer Van Der Put, et al., 1997; Booth et al., 1994; Gharghori et al., 2009; Dessani, 1994).

Although the prediction potential of the P/E ratio has been confirmed by surveys performed in a variety of countries, the findings of some studies are not univocal. In particular, the findings of Johnson et al. (1989) are antithetical to those of 'P/E effect' studies in terms that they demonstrate that abnormal returns are correlated to the stock prices of firms with a high P/E ratio. Other researchers who question the validity of the 'P/E effect' either maintain that Basu's results are sample-specific (Cook and Rozeff, 1984) or that the 'P/E effect' is dependent on the size of the firm concerned (Reinganum, 1981, 1983; Banz, 1981; Roll, 1981). In particular, the returns on the assets of small-size firms systematically depart from the levels that were predicted based on the market model and this is held to account for much of the 'P/E effect'.

3. Objectives and Research Hypotheses

The literature review shows that the semi-strong form of market efficiency hypothesis can be tested for two main purposes (Lee et al., 2012): 1) establishing the response times of stock prices to the release of new information; 2) verifying whether investors can achieve abnormal returns by trading on the basis of publicly available information. To answer the second of these questions, this research adopts an approach which uses accounting information, market multiples and event study methods.

If the literature is screened with this aim in mind, it is found that due to its major implications for the definition of suitable portfolio strategies, the assumption that fundamental analysis is a major predictor of share returns has been put to test in a large number of published surveys.

In point of fact, most of the researchers concerned confined their surveys to data referred to a single reference market, which means that the risk of a country bias of their models can barely be ruled out. Moreover, our literature review has shown that while the US financial market has been the object of a great many empirical investigations, surveys of the equally important European market have been few and fragmentary. Additionally, it is worth noting that researches to validate the semi-strong efficiency hypothesis in this market became less and less frequent during the recent economic crisis and that the resulting fragmentariness of the prior year picture may undermine the

validity of the findings of investigations into the present situation of the relevant financial markets. Lastly, it is worth adding that the relevance of 'contextual market analysis' has been explored in just a few empirical studies.

Accordingly, the aim of this paper is to appraise both the actual efficiency of fundamental analysis as a stock return predictor and the role of 'contextual capital market analysis' in European financial markets. An additional research goal is establishing if the European market could be described as informationally strong even during the recent economic crisis.

In the light of these objectives, we set out to validate the following research hypotheses:

H_1: *Fundamental analysis can effectively help define a portfolio strategy capable of predicting abnormal returns following dividend announcements in the European financial market.*

H_2: *Contextual capital market analysis is a component of European abnormal return prediction models.*

H_3: *The information is not fully reflected in European securities in as rapid a manner as is postulated by the semi-strong form of the efficient market hypothesis.*

4. Materials and Methods

The sample used for our empirical analysis includes 1,708 manufacturing and service businesses listed in the following Stock Exchanges: Borsa Italiana (190), Frankfurter Wertpapierbörse (400), London Stock Exchange (1,038), Bolsa de Madrid (80) (Table 1). The reference years are 2012 and 2013.

Table 1. Initial sample

	2012	**2013**	**Total**	**%**
Borsa Italiana	190	190	380	11%
Frankfurter Wertpapierbörse	400	400	800	23%
London Stock Exchange	1,038	1,038	2,076	61%
Bolsa de Madrid	80	80	160	5%
Total	**1,708**	**1,708**	**3,416**	**100%**

Since residuals were analyzed using the Cook's Distance method, the number of observations was optimised to 3,298 (Table 2).

In the light of our research hypotheses and the types of variables analysed, our empirical survey was performed by searching for a possible correlation between the variables (a correlation matrix) and using linear regression analysis (OLS) to test our research hypotheses. Our data analysis was conducted using the SPSS statistics 17.0 software and the figures were calculated by reference to the balance sheet data of the year prior (t-1) to the dividend announcement (t).

Table 2. Sample without outliers

	2012	2013	Total	%
Borsa Italiana	182	184	366	11%
Frankfurter Wertpapierbörse	396	383	779	24%
London Stock Exchange	984	1009	1993	60%
Bolsa de Madrid	80	80	160	5%
Total	**1,642**	**1,656**	**3,298**	**100%**

Specifically, the following model was used to establish the meaningfulness of our research hypotheses:

$$Abnormal\ returns_t = \alpha + \beta_1 \frac{D_{t-1}}{E_{t-1}} + \beta_2 EPS_{t-1} + \beta_3 ROE_{t-1} + \beta_4 current\ ratio_{t-1} +$$

$$+ \beta_5 \frac{NFP_{t-1}}{total\ assets_{t-1}} + \beta_6 \frac{EBIT_{t-1}}{financial\ \text{expenses}_{t-1}} + \beta_7 \frac{P_{t-1}}{E_{t-1}} + \beta_8 \frac{P_{t-1}}{cash\ flow_{t-1}} +$$

$$\beta_9 \frac{P_{t-1}}{sales_{t-1}} + \beta_{10} \frac{P_{t-1}}{BV_{t-1}} + \beta_{11} size\ \text{effect}_{t-1} + \beta_{12} industry + \beta_{13} GDP + \beta_{14} inflation\_avg + \varepsilon$$

where:

- Abnormal returns$_t$ = r - E(r). r = $Log\left(\frac{P_t}{P_{t-1}}\right)$ where: P_t = price of the security at time of dividend announcement; P_{t-1}= price of the security at time t-1. $E(r) = \alpha_j + \beta_{j,m}\, r_m + \varepsilon_j$ where: α_j = Jensen's α; $\beta_{j,m} = \frac{Cov_{j,m}}{Var_m} = \frac{\sigma_j \sigma_m \rho_{j,m}}{\sigma_m^2}$; r_m = daily index of the reference market for the firms in the sample (London Stock Exchange, Bolsa de Madrid, Borsa Italiana, Frankfurter Wertpapierbörse); ε_j = residuals. α and $\beta_{j,m}$ were estimated using the Ordinary Least Square (OLS) method applied to the market data of securities in a pre-event date 250 day estimation window (Binder, 1998). Once the abnormal daily returns had been determined, the variable was estimated by calculating the mean abnormal returns recorded daily in the period between a first dividend announcement and the next (made at t+1).
- $\frac{D_{t-1}}{E_{t-1}} = \frac{accounting\ value\ \text{of indebtedness}_{t-1}}{accounting\ value\ \text{of equity}_{t-1}}$;
- $EPS_{t-1} = earnings\ per\ share\ at\ (t-1) = \frac{aftertax\ profit_{t-1}}{number\ of\ shares_{t-1}}$;
- $ROE_{t-1} = Return\ on\ Equity\ at\ (t-1) = \frac{aftertax\ profit_{t-1}}{equity_{t-1}}$;
- $current\ \text{ratio}_{t-1} = \frac{current\ assets_{t-1}}{current\ liabilities_{t-1}}$;
- $\frac{NFP_{t-1}}{total\ assets_{t-1}} = \frac{net\ financial\ \text{position}_{t-1}}{total\ book\ value\ of\ assets_{t-1}}$;

- $\frac{EBIT_{t-1}}{financial\ expenses_{t-1}} = \frac{earnings\ before\ interest\ and\ taxes_{t-1}}{financial\ expenses_{t-1}}$;

- $\frac{P_{t-1}}{E_{t-1}} = \frac{market\ cap_{t-1}}{net\ earnings_{t-1}}$; $\frac{P_{t-1}}{cash\ flow_{t-1}} = \frac{market\ cap_{t-1}}{cash\ flow_{t-1}}$;

- $\frac{P_{t-1}}{sales_{t-1}} = \frac{market\ cap_{t-1}}{sales_{t-1}}$; $\frac{P_{t-1}}{BV_{t-1}} = \frac{market\ cap_{t-1}}{book\ value_{t-1}}$.

- *Size Effect*$_{t-1}$ = A variable which measures the sizes of the sample firms and is equal to the logarithm of the book value of the firm's total assets.
- *Industry* = A variable which measures the role of 'contextual capital market analysis' within the prediction model and reflects the industrial sector in which the sample firms conduct business. It is a dummy whose value is 0 for service firms and 1 for manufacturing businesses. This variable has been included in the attempt to assess the influence of the industrial sector on the results obtained with the model;
- *GDP* = A variable which measures the role of 'contextual capital market analysis' within the prediction model. It reflects the growth rate of the real GDP (Real Gross Domestic Product) of the country in which the sample firms conducted their operations in 2012-2013. For the purposes of our analysis, the countries were grouped into three categories: 1) Countries in recession and, hence, with a negative GDP variation; 2) Slightly growing countries with GDP variations ranging between 0 and +0,4%; 3) Growing countries with a GDP variation of +0,5% or more.
- *Inflation* = A variable which measures the relevance of 'contextual capital market analysis' within the prediction model. It reflects the mean inflation rate of the country where the sample firms were operating in 2012-2013.

The data were collected from London Stock Exchange, Bolsa de Madrid, Borsa Italiana and Frankfurter Wertpapierbörse and were completed with those obtained from Bloomberg, Thompson Reuters, Cerved and Eurostat.

5. Results and Discussion

Before we comment on the results of the regression analysis, it is convenient to develop a few reflections on the correlations between the variables which were normally distributed. Table 3 shows eight significant correlations between the variables used for our analysis: abnormal, D/E, EPS, ROE, P/E, P/sales, P/cash flow, Inflation Average, GDP.

Table 3. Correlation Matrix (Pearson)

	Abnormal	D/E	EPS	ROE	Current ratio	NFP/total asset	EBIT/financial expenses	P/E	P/cash flow	P/sales	P/BV	Size effect	Industry	GDP	Inflation
Abnormal	1														
D/E	0.260**	1													
EPS	0.135**	0.018	1												
ROE	0.326**	-0.011	0.011	1											
Current ratio	0.012	0.024	-0.014	-0.004	1										
NFP/total asset	0.024	0.009	0.007	0.001	0.009	1									
EBIT/financial expenses	-0.011	0.026	0.001	-0.021	-0.008	-0.009	1								
P/E	-0.282**	-0.008	-0.009	-0.235**	-0.017	-0.004	0.018	1							
P/cash flow	0.008	-0.008	0.000	0.003	-0.008	-0.002	0.011	0.021	1						
P/sales	0.005	-0.026	0.005	0.006	-0.024	-0.001	-0.009	-0.044*	-0.040*	1					
P/BV	0.008	0.004	0.032	0.000	-0.019	0.003	-0.029	0.000	0.013	-0.029	1				
Size effect	-0.017	-0.028	0.004	-0.007	0.012	0.000	-0.023	0.003	0.032	0.023	0.000	1			
Industry	-0.028	-0.004	-0.012	-0.020	0.007	0.012	0.006	0.030	0.016	-0.019	-0.012	-0.011	1		
GDP	0.003	-0.003	0.001	0.022	-0.032	-0.025	-0.024	0.000	-0.018	0.007	0.006	-0.009	0.003	1	
Inflation	0.034	-0.007	0.008	-0.012	-0.032	-0.003	0.001	-0.011	0.009	-0.010	-0.032	0.016	0.011	0.160**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

To validate our research hypotheses we investigated the cause-effect relations between the variables using OLS analysis methods. The results of our OLS analysis, of the ANOVA test, of the Shapiro Wilk (W) test for normal data, the Breusch-Pagan test for heteroskedasticity are reported in Table 4.

Table 4. OLS analysis

Model	Abnormal return			
	Standardized coefficients			T-statistic
D/E	0.259***			16.953
EPS	0.124***			8.150
ROE	0.277***			17.670
Current ratio	0.007			0.440
NFP/total asset	0.019			1.273
Ebit/financial expenses	-0.008			-0.537
P/E	-0.213***			-13.521
P/cash flow	0.013			0.878
P/sales	0.001			0.112
P/BV	0.004			0.248
Size effect	-0.009			-0.602
Industry	-0.014			-0.947
GDP	-0.008			-0.513
Inflation	0.037**			2.417
Model summary	R-Square	Adjusted R-Square		
	0.237	0.234		
ANOVA	F			
	72.813***			
Shapiro Wilk W test for normal data	W	V	z	
e_residuals	0.996	6.78	5	
Breusch-Pagan test for heteroskedasticity	Chi^2	prob. > Chi^2		
	0.420	0.5176		

Significance level: 1% (***); 5% (**)

Specifically, our model shows an adjusted R^2 of 23.4%, while the results of the ANOVA test are an F-value of 72.813 and a significance value below 0.01. Moreover, the Shapiro Wilk shows that the data included in the model are normally distributed, whereas the Breusch-Pagan test provides evidence of the absence of heteroskedasticity between the variables.

As far as the analysis of the regression coefficients is concerned, it was found that abnormal returns are significantly associated with five independent variables: D/E; EPS; ROE; P/E; INFLATION.

Only one of these, i.e. the P/E market multiple, is negatively associated (beta coefficient = -0.213) with abnormal returns. Concerning variables with a positive influence on abnormal returns, it was found that ROE (beta coefficient = 0.277) and D/E leverage (beta coefficient = 0.259) were much more relevant than earnings per share (beta coefficient = 0.124) or inflation (beta coefficient = 0.037).

As the dependent variable abnormal returns was significantly correlated to three accounting indicators (ROE, D/E, EPS) versus a single market multiple (P/E), it is possible to conclude that accounting indicators are much more reliable predictors of abnormal share returns than market multiples.

Unlike other researchers (Reinganum, 1981, 1983; Banz, 1981; Roll, 1981; Goodman and Peavy, 1986; Jaffe et al., 1989), we did not observe any 'size effect', which means that the European model for the prediction of abnormal returns works effectively irrespective of the sizes of the listed companies analysed.

It is worth noting that accounting indicators and market multiples have different prediction potentials, but this finding goes to support the assumption that regardless of the sizes of the listed companies concerned fundamental analysis may greatly help select those share portfolios that are likely to generate anomalous returns (Assumption 1 confirmed).

Some 'contextual capital market analysis' variables are major components of the European abnormal return prediction model proposed in this paper. For instance, we found a slight, but nevertheless positive relation between the inflation variable and abnormal returns (beta coefficient = 0.037). This finding is consistent with the results that Swanson, Rees and Juarez-Valdes obtained in an empirical survey conducted in Mexico in 2003, though in that country the influence of inflation was seen to be stronger. However, as no other macroeconomic variables were observed to exert any influence on the prediction potential of the model, these findings are clear evidence that hypothesis 2 is only partially validated. Whereas the prediction models adopted in other world markets include a great many macroeconomic variables, the only variable that adds, though slightly, to the prediction ability of the European model is inflation.

As far as our third research hypothesis is concerned, our empirical survey has shown that stock prices are slow to respond to certain balance sheet data (ROE, D/E, EPS) and that this may enable investors to earn extra-returns above the level that could be anticipated based on the market model (abnormal returns).

This observation disproves the semi-strong form efficiency market hypothesis that was advanced by Fama (1970). Indeed, the conclusion suggested by our empirical analysis is that the expected market returns are slow to respond to the information provided thanks to the disclosure of the annual accounts of listed companies. In all probability, investors are no longer prepared to make reliance on these data because their confidence has been badly shaken by recent scandals involving large-size listed companies or, more generally, because they attach less importance to published data than to the past trends in stock prices.

In part, the conclusions of the test conducted to validate the semi-strong form market efficiency hypothesis are consistent with our observations concerning market multiples.

Indeed, whereas data such as cash flow, sales and book value are unrelated to abnormal share returns, in line with evidence provided by other authors the P/E multiple is correlated with such abnormal returns (Basu, 1977, 1983; Fama and French, 1992).

We found that the abnormal returns recorded following dividend announcements increase in inverse proportion to the value of P/E at time t-1. This result is consistent with the conclusions of a number of empirical surveys whose authors concluded that investment portfolios with a greater proportion of low P/E securities were likely to lead to higher expected abnormal returns and would consequently enable investors to cash extra-earnings (Basu 1977; Kelly et al., 2008)[1]. These researches have shown that the semi-strong form market efficiency hypothesis is not verified since the generation of extra-returns is clear evidence that the past earnings data offered by the P/E multiple are far from promptly incorporated into the relevant stock prices.

In line with these findings, our survey has proved that the information content of the P/E multiple is not rapidly reflected in prices and that this gives investors the opportunity to cash abnormal returns flowing from the informational inefficiency of the market (as a result, hypothesis 3 is validated).

[1] In contrast with the findings of Reinganum (1981; 1983), Banz (1981) and Roll (1981), our research does not point to any significant relation between firm size and P/E effect.

6. Discussion and Conclusion

The findings of our empirical survey of European financial markets confirm that fundamental analysis can effectively help investors select share portfolios with a distinct potential for generating abnormal returns regardless of the sizes of the listed companies concerned. Accordingly, in line with the claim advanced by Ou and Penman in the 1980s, it would appear that regardless of the financial crisis fundamental analysis does capture the values of securities in present-day Europe, but that the relevant information is not reflected in stock prices. Moreover, whereas the overall economic cycle seems to have a considerable impact on financial markets throughout the world, the model adopted in Europe to predict abnormal returns shows a positive, though slight influence of inflation, but not of other macroeconomic variables.

The fact that the semi-strong form of information efficiency is far from validated and the modest influence of inflation on the prediction potential of the model may indicate that despite the difficulties experienced by major euro area countries and the United Kingdom, the European financial market still seems to be characterised by high levels of convergence trading. The convergence trading strategy makes the most of differences in market stock prices and in fundamental prices for arbitrage operations.

As is well known, by arbitrage we mean a strategy which builds on market inefficiences in order to generate abnormal returns if and when the prices revert to their fundamental values. The aim of this strategy, which generally adopts technical analysis procedures, is to cash returns above the expected levels without exposing investors to additional risks. This means that investors will not necessarily purchase securities of companies that can boast excellent operating results and cash flows, but opt for shares with a traditional differential between market and fundamental price (as revealed by an event or by new information which was not 'instantly' zeroed as a result of market movements). Hence, arbitrage operations are not transacted in respect of companies with a solid financial position, but – paradoxically – in respect of companies characterised by considerable information opacity.

In the light of this finding we have to emphasise both the risk that the financial sector of the economy may lose touch with actual economic cycles and the present inability of this sector to support growth capital in the Schumpeterian meaning of this term (Mazzuccato and Wray, 2015; Campanella et al., 2013a).

These conclusions are supported by the indication that the P/E effect does operate in the European financial market. Indeed, in the European market information is not ‘fully reflected‘ in stock prices in as rapid a manner as is postulated by the semi-strong form of the efficient market hypothesis. In this case, too, financial operators seem to find it difficult to correctly evaluate published data concerning the bottomline results of firms.

The finding that market prices diverge from the fundamental values of the relevant security induces us to inquire into the causes of this situation. In a market which is not the strong-form information efficiency type, investors do not have instantly available all the information that would be needed to correctly estimate the fundamental values of shares and it cannot be ruled out that they fail to search for information in the belief that the cost of collecting data exceeds the extra-earnings they might cash in a best-case scenario. In point of fact, if adequate information is made available to the general public in the future, the market prices of the shares will surely be closer to their fundamental value. It goes without saying that the longer it takes for market prices to reflect the fundamental values of the shares concerned, the more investors who are capable of putting to advantage all the information that is made available to the public will be able to cash extra returns thanks to the information offered to them by fundamental analysis procedures.

On closer analysis, the misalignment observed between the market prices and fundamental values of securities may either be traced to the inability of investors to correctly interpret and use the information that is made available or, and even more probably, to the fact that economic agents adopt principles and procedures other than those recommended by traditional theorists (Shleifer, 1999). The fact that behaviour in the market is rarely as rational as is postulated by classical theory and abnormal market price deviations from the fundamental values of the securities concerned have induced a great many researchers to analyse in depth the insights offered by cognitive psychology, a discipline which investigates the mental processes governing the way information is interiorised. The findings of these investigations have led to the emergence of behavioural finance, a discipline which emphasises the irrational conduct of many investors in financial markets, as well as their tendency to underrate the risks associated with given investments on the wrong assumption that events held to be associated with disclosed information will ultimately be averted (Kahnemann and Tversky, 1979).

The findings of our survey do not entitle us to draw any final conclusions concerning the effects of irrational choices made by investors in developing their investment strategies within the European financial market. However, future researches might make it their task to complete the prediction model dealt with in this survey through the inclusion of qualitative variables reflecting the risk perceptions of investors and their attitudes towards the announcement of prospective future events (Campanella et al., 2013b). Building on such a model, it would be possible to test the market for efficiency in the light of the additional insights offered by the effects of the irrational behavioural patterns of investors.

References

[1] Abarbanell, J. S., and Bushee, B. J. (1997). "Fundamental Analysis, Future Earnings, and Stock Prices", *Journal of Accounting Research*, 35(1): 1-24.

[2] Abarbanell, J. S., and Bushee, B. J. (1998). "Abnormal Returns to a Fundamental Analysis Strategy", *The Accounting Review*, 73(1): 19-45.

[3] Aggarwal, R., Rao, R. P. and Hiraki, T. (1990). "Regularities in Tokyo stock exchange security returns: P/E, size, and seasonal influences", *Journal of Financial Research*, 13(3): 249-263.

[4] Alesii, G. (2006). "Fundamentals Efficiency of the Italian Stock Market: Some Long Run Evidence", *International Journal of Business and Economics*, 5(3): 245-264.

[5] Anthony, J. H., and Ramesh, H. (1992). "Association between accounting performance measures and stock prices: a test of the Life Cycle Hypothesis", *Journal of Accounting and Economics*, 15(2): 203-227.

[6] Bajo, E. (2010). "The Information Content of Abnormal Trading Volume", *Journal of Business Finance & Accounting*, 37(7-8): 950-978.

[7] Bajo, E., and Petracci, B. (2006). "Do what Insiders Do: Abnormal Performances after the Release of Insiders' Relevant Transactions", *Studies in Economics and Finance*, 23(2):94-118

[8] Banz, R.W. (1981). "The Relationship Between Return and Market Value of Common Stocks", *Journal of Financial Economics*, 9(1): 3-18.

[9] Basu, S. (1975). "The Information Content of Price-Earnings Ratios", *Financial Management*, 4(2): 53-64.

[10] Basu, S. (1977). "Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis", *The Journal of Finance*, 32(3): 663-682.

[11] Basu, S. (1983). "The Relationship Between Earnings' Yield, Market Value and Return for NYSE Common Stocks: Further evidence", *Journal of Financial Economics*, 12(1): 129-156.

[12] Binder, J. (1998). "The event study methodology since 1969", *Review of Quantitative Finance and Accounting*, 11(2): 111-137.

[13] Booth, G.G., Martikainen, T., Perttunen, J., and Yli-Olli, P. (1994). "On the Functional Form of Earnings and Stock Prices: International Evidence and Implications for the P/E Anomaly", *Journal of Business Finance and Accounting*, 21(3): 395-408.

[14] Brealey, R.A., Myers, S.C., and Allen, F. (2011). *Principles of Corporate Finance*, 10th Ed., McGraw-Hill.

[15] Brealey, R.A., Myers, S.C., Allen F. and Sandri S. (2011). *Principi di Finanza aziendale*, Sesta edizione(In Italian), McGraw-Hill

[16] Brouwer Van Der Put Veld, I., and Jeroen, C. (1997). "Contrarian investment strategies in a European context", *Journal of Business Finance & Accounting*, 24(9-10): 1353-1366.

[17] Campanella F., Del Giudice M. and Della Peruta M.R. (2013a). "Informational approach of family spin-offs in the funding process of innovative projects: an empirical verification", *Journal of Innovation and Entrepreneurship*, 2(18):1-23.

[18] Campanella, F., Del Giudice, M. and Della Peruta, M. R. (2013b). "The role of information in the credit relationship", *Journal of Innovation and Entrepreneurship*, 2(17): 1-16.

[19] Chan, L.K.C., Hamao, Y., and Lakonishok. J. (1991). "Fundamentals and Stock Returns in Japan", *The Journal of Finance*, 46(5): 1739-1764.

[20] Chou, S.R., and Johnson, K.H. (1990). "An Empirical Analysis of Stock Market Anomalies: Evidence from the Republic of China in Taiwan", In: Rhee, S.G, and Chang, R.P.(Eds.): *Pacific Basin Capital Market Research*, Elsevier Science Publishers, North-Holland.

[21] Cook, T.J., and Rozeff, M.S. (1984). "Size and Earnings/Price Ratio Anomalies: One Effect or Two?", *The Journal of Financial and Quantitative Analysis*, 19(4): 449-466.

[22] Dainelli, F., and Visconti, A. (2014), "Gli indicatori di bilancio per le valutazioni di mercato: uno studio di value relevance in Italia", Impresa Progetto, *Electronic Journal of Management*, Issue 1[Online]Available at http://www.impresaprogetto.it/contributions-and-working-papers/2014-1/dainelli-visconti.

[23] Dessani, A. (1994). "Strategie di investimento e rapporto P/U: un'ulteriore verifica", *Analisi finanziaria*, n. 13: 97-112 (In Italian).

[24] Dowen, R. J., (2001). "Fundamental Information and Monetary Policy: The Implications for Earnings and Earnings Forecasts", *Journal of Business Finance and Accounting*, 28(3-4): 481-501.

[25] Dreman, D.N., and Berry, M.A. (1995). "Overreaction, Under-reaction, and the Low-P/E Effect", *Financial Analysts Journal*, 51(4): 21-30.

[26] Edirisinghe, N. C. P. and Zhang, X. (2007). "Generalized DEA model of fundamental analysis and its application to portfolio optimization", *Journal of Banking & Finance*, 31(11): 3311-3335.

[27] Fama, E. (1963). "Mandelbrot and the stable Paretian hypothesis", *Journal of Business*, 36(4): 420-429.

[28] Fama, E. (1965). "The behavior of stock-market prices", *Journal of Business*, 38(1): 34-105.

[29] Fama, E. (1970). "Efficient Capital Markets: a review of theory and empirical work", *The Journal of Finance*, 25(2): 383-417.

[30] Fama, E. (1995). "Random walks in stock market prices", *Financial Analysts Journal*, 51(1): 75-80.

[31] Fama, E., and French, K.R. (1992). "The Cross-Section of Expected Stock Returns", *The Journal of Finance*, 47(2): 427-465.

[32] Fama, E., Fisher, L., Jensen, M.C., and Roll, R. (1969). "The adjustment of Stock Prices to New Information", *International Economic Review*, 10(1):1-21.

[33] Fuller, R.J., Huberts, L.C., and Levinson, M.J. (1993). "Returns to E/P Strategies, Higgledy-Piggledy Growth, Analysts' Forecast Errors, and Omitted Risk Factors", *Journal of Portfolio Management*, 19(2):13-24.

[34] Gharghori, P., Lee, R., and Veeraraghavan, M., (2009). "Anomalies and stock returns: Australian evidence", *Accounting & Finance*, 49(3): 555-576.

[35] Goodman, D.A., and Peavy III, J.W. (1986). "The Interaction Of Firm Size And Price-Earnings Ratio on Portfolio Performance", *Financial Analysts Journal*, 42(1): 9-12.

[36] Gordon, M.J., and Shapiro, E. (1956). "Capital Equipment Analysis: The Required Rate of Profit", *Management Science*, 3(1): 102-110.

[37] Grossman, S.J., and Stiglitz, J.E. (1980). "On the Impossibility of Informationally Efficient Markets", *The American Economic Review*, 70(3): 393-408.

[38] Jaffe, J., Keim, D. B., and Westerfield, R. (1989). "Earnings yields, market values, and stock returns", *The Journal of Finance*, 44(1):135-148.

[39] Johnson, R.S., Fiore, L.C., and Zuber, R. (1989). "The Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: An Update of the Basu Study", *Financial Review*, 24(3): 499-505.

[40] Kahneman, D., and Tversky, A. (1979). "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, 47(2): 263-291.

[41] Kelly, S., McClean, J., and McNamara, R. (2008). "The Low P/E Effect and Abnormal Returns for Australian Industrial Firms", *21st Australasian Finance and Banking Conference 2008 Paper*.

[42] Kendall, M.G., and Hill, A.B. (1953). "The analysis of Economic Time-Series-Part I: Prices", *Journal of the Royal Statistical Society*, *Series A (General),*116(1): 11-34.

[43] Keown, A., and Pinkerton, J. (1981). "Merger Announcement and Insider Trading Activity", *The Journal of Finance*, 36(4): 855-869.

[44] Kosowski, R., Timmerman, A., Wermers, R., and White, H. (2006). "Can Mutual Fund "Stars" Really Pick Stocks? New Evidence from a Boostrap Analysis", *The Journal of Finance*, 61(6): 2551-2595.

[45] Kothari, S. P., and Warner, J. B. (2007). "Econometrics of Event Studies", *Handbook of Corporate Finance: Empirical Corporate Finance*, B. Espen Eckbo.

[46] Lee, C. F., Finnerty, J., Lee, J., Lee, A.C., and Wort, D. (2012). *Security analysis, portfolio management, and financial derivatives*, World Scientific Books.

[47] Lev, B., and Thiagarajan, S. R. (1993). "Fundamental Information Analysis", *Journal of Accounting Research*, 31(2):190-215.

[48] Levis, M. (1989). "Stock Market Anomalies: A re-assessment based on the UK evidence", *Journal of Banking and Finance*, 13(4): 675-696.

[49] MacKinlay, A.C. (1997). "Event studies in Economics and Finance", *Journal of Economic Literature*, 35(1): 13-39.

[50] Malkiel, B.G. (1995). "Returns from Investing in Equity Mutual Funds 1971 to 1991", *The Journal of Finance*, 50(2): 549-572.

[51] Martikainen, T. (1989). "Modelling Stock Price Behaviour by Financial Ratios", *Rivista di Matematica per le Scienze Economiche e Sociali,* 12(1):119-138 (In Italian).

[52] Mazzuccato, M., and Wray, L.R. (2015). "Financing the capital development of the economy: a Keynes-Schumpeter-Minsky Synthesis", Levy Economics Institute, *Working paper No. 337*.

[53] Mukherji, S., Dhatt, M. S., and Kim, Y. H. (1997). "A fundamental analysis of Korean stock returns", *Financial Analysts Journal*, 53(3): 75-80.

[54] Murgia, M. (1990). "L'annuncio dei dividendi nel mercato azionario italiano", *Centro di ricerche finanziarie, Gruppo IMI*(In Italian).

[55] Ou, J. A., and Penman, S. H. (1989). "Financial Statement Analysis and the Prediction of Stock Returns", *Journal of Accounting and Economics*, 11(4): 295-329.

[56] Patell, J.M., and Wolfson, M.A. (1984). "The intraday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements", *Journal of Financial Economics*, 13(2): 223-252.

[57] Reinganum, M. R. (1981). "Misspecification of capital asset pricing: Empirical anomalies based on earnings' yields and market values", *Journal of Financial Economics*, 9(1): 19-46.

[58] Reinganum, M. R. (1983). "The anomalous stock market behavior of small firms in January: Empirical tests for tax-loss selling effects", *Journal of Financial Economics*, 12(1): 89-104.

[59] Richardson, S., Tuna, I., and Wysocki, P. (2010). "Accounting anomalies and fundamental analysis: A review of recent research advances", *Journal of Accounting and Economics*, 50(2): 410-454.

[60] Roenfeldt, R. L., and Cooley, P. L. (1978). "Predicting corporate profitability for investment selection", *Journal of Business Finance & Accounting*, 5(1): 57-65.

[61] Roll, R. (1981). "A Possible Explanation for the Small Firm Effect", *The Journal of Finance*, 36(4): 879-888.

[62] Roll, R. (1994). "What every CFO Should Know about Scientific Progress in Financial Economics: What is Known and What Remains to be Resolved", *Financial Management*, 23(2): 69-75.

[63] Salmi, T., Virtanen, I., and Yli-Olli, P. (1997). "The generalized association between financial statements and security characteristics", *Scandinavian Journal of Management*, 13(2): 121-136.

[64] Samuelson, P. A. (1965). "Proof that properly anticipated prices fluctuate randomly", *Industrial Management Review*, 6(2): 41-49.

[65] Samuelson, P. A. (1998). "Summing up on business cycles: opening address", In: Conference Series-Federal Reserve Bank of Boston, Federal Reserve Bank of Boston, 42: 33-36.

[66] Shleifer, A. (1999). *Inefficient Markets: An Introduction to Behavioral Finance*, Oxford: Oxford University Press.

[67] Skogsvik, S. (2008). "Financial statement information, the prediction of book return on owners' equity and market efficiency: the Swedish case", *Journal of Business Finance & Accounting*, 35(7-8): 795-817.

[68] Swanson, E. P., Rees, L., and Juarez-Valdes, L. F. (2003). "The contribution of fundamental analysis after a currency devaluation", *The Accounting Review*, 78(3): 875-902.