Earnings volatility and the role of cash flows in the capital markets: Empirical evidence

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ABSTRACT

The recent global financial crisis brought to the forefront of the capital markets the importance of firm fundamentals and especially, the valuation role of cash flows. In this study, we examine the role of earnings and cash flows in two major capital markets, namely, USA and France. We hypothesize that the relationship between cash flows and security returns improves when earnings are transitory and this robustness is country specific. The dataset consists of more than 37,000 USA and French firm-year observations over an eight-year period. Multivariate statistical regression analysis is undertaken to test the major research hypotheses. Results indicate that when earnings are transitory (unstable), investors pay more attention to cash flows and less attention to earnings, a result indicating that investors penalize firms with unstable earnings. In summary, the evidence provided in this study supports that there are substantial differences in the way investors and financial analysts perceive financial information such as earnings and cash flows in France and USA. These results should be of great importance to the major stakeholders such as investors, creditors, financial analysts, especially after the recent global financial crisis and the collapse of giant organizations worldwide.

Keywords: Transitory Earnings, Capital markets, Cash flows, Empirical.

1. INTRODUCTION

The on-going global financial crisis led many giant organizations into financial distress, among those, Lehman Brothers, General Motors, Kodak. One of the major reasons for corporate distress is the inability of the firm to meet its cash flow obligations (Uhrig-Homburg, 2005; Orpurt and Zang, 2009; Givoli et al, 2009; Garrod and Hadi, 1998)) Capital markets have been emphasizing the informativeness of earnings and to a lesser extent the value relevance of cash flows. The usefulness of earnings has also been examined recently in conjunction with cash flows (Bali et al (2009), Banker et al (2009), Bartov et al., 2001; Charitou et al., 2000, Charitou, 2010, Ball et al., 2000). There exists empirical evidence to support that earnings are more useful than cash flows in the capital markets. Extant evidence is inconclusive on the valuation of cash flows beyond earnings in the international capital markets. Furthermore, to date comparative international research on the informativeness of cash flows has been limited. Moreover, researchers argue that when aggregate data is used, it is assumed that the relationship between earnings and cash flows with security returns is uniform across firms, which is not true in the real world. This study hypothesizes the informativeness of earnings and cash flows is country specific and it depends on the variability of earnings over time (Dumontier and Raffournier, 2002; Ball et al., 2003; Ali and Hwang. 2000; Dumontier, 1998)

Earnings permanence studies showed that when firms report more stable earnings streams, these earnings are more informative in the stock markets (Chambers, 2004). Cheng et al. (1996) and Charitou et al (2000) extended prior studies on this topic and added cash flow variables in their models. They

found that the valuation role of cash flow from operations(CFO) should increase when the variability of earnings increases. These researchers investigated whether the informativeness of cash flows increases when earnings are more more volatile. More volatile (e.g, transitory) earnings have smaller marginal impact on security returns. Moreover, their results showed that the informativeness of earnings decreases, and the value relevance of cash flows increases with increases in the variability of earnings.

Regression analysis was undertaken to test the major hypothesis of this study. A sample of more than 37,000 U.S. and French firm-year observations was used to test the research hypothesis. The major conclusions of the empirical results are summarized as follows. First, regarding our basic proposition which stated that earnings and cash flows are associated with stock prices in the USA and France, results show that both earnings and cash flows are taken into consideration by investors in their investment decisions. Second, regarding our major hypothesis which stated that the informativenss of earnings and cash flows is country specific and depends on the transitoriness of earnings, results show that when earnings are transitory (unstable), investors pay more attention to cash flows and less attention to earnings, a result indicating that investors penalize firms with unstable earnings.

In summary, evidence provided in this study supports that there are substantial differences in the way investors and financial analysts perceive financial information such as earnings and cash flows in USA and France and that the value relevance of cash flows depends on the volatility of earnings.

2. LITERATURE REVIEW AND MOTIVATION

Even though earnings have been the prevailing measure of financial performance in the capital markets, the recent global financial crisis led capital market participants and top management to pay much more attention to cash flows, since evidence shows that firms face financial distress problems due to their cash shortage which leads to their inability to repay their debt obligations.

In the past few years there has been an increased interest in the role of earnings and cash flows in explaining stock prices. Contextual factors, such as earnings variability were used to identify specific cases where the informativeness of earnings and cash flows is altered (improves or deteriorates). Using USA data, Cheng et al (1996) and Charitou et al (2000) hypothesized that when earnings are transitory, the valuation role of earnings is reduced, whereas the informativeness of cash flows increases. In summary, these results are of great importance since earlier studies assumed that the earnings returns relation is the same across firms. These studies, however, disprove this assumption and show that the value relevance of earnings and cash flows depends on the level of the variability of these measures (Barth et al., 2010)

Even though prior studies examined the variability of earnings and cash flows, all these studies examined this issue by testing only a single country at a time, mainly USA or UK, which are considered common law countries. The present study differs from prior studies since it compares and contrasts the informativeness of earnings and cash flows in two countries, namely USA and France. The US stock market is based on a common law, whereas the French market is based on a code law system. Thus, the present study goes a step further to examine whether the value relevance of earnings and cash flows is country specific and whether it depends on the volatility of earnings (Chan et al., 2006; Cheng and Yang, 2003; Dechow, 1994; Vuolteenaho, 2002).

Thus, the inconclusive results in prior studies, and the limited research on this issue provide motivation for this study. The research hypothesis to be tested is:

Hypothesis: The informativeness of cash flows is country specific and improves when earnings are volatile (transitory), whereas the informativeness of earnings increases when earnings are more stable (permanent).

This hypothesis predicts that the valuation role of earnings decreases when earnings are transitory and therefore, the value relevance of cash flows improves in both USA and France when earnings are transitory.

3.0 RESEARCH DESIGN

Our dataset consists of all US and French industrial firms with all information available for the computation of operating cash flows, operating earnings and stock returns, resulting in a final sample of more than 37,000 firm-year observations over an eight-year period. Consistent with prior empirical studies, observations that were regarded as outliers were excluded from the sample, i.e. (below 1% and over 99%).

In order to examine whether investors in the USA and France take into consideration in their investment decisions the levels and changes of earnings and cash flows, independent of each other, the following univariate regression model will be used:

$$RET_{it} = k_0 + k_i X_i + e_I \qquad\qquad (1)$$

where:

X_i: is replaced by:

  E: Operating Earnings
  ΔE: Change in operating-earnings
  CFO: Operating cash flows
  ΔCFO: Change in operating cash flows.
  RET_{it}: stock return for firm i measured over a 12-month return interval.

k_0: the intercept term
k_i: slope coefficient
e_i: error term

In order to investigate whether both the levels and changes of earnings and cash flows have different information effect in the stock markets, namely in USA and France, the basic regression model that includes only the level and changes of earnings and cash flows will be extended to include additional dummy variables. The following multivariate regression model will be tested:

$$RET_{it} = k_0 + k_1 E_{it} + k_2 \Delta E_{it} + k_3 CFO_{it} + k_4 \Delta CFO_{it} + k_5 E_{it}*D + k_6 \Delta E_{it}*D + k_7 CFO_{it}*D + k_8 \Delta CFO_{it}*D + e_{it}$$

where RET_{it}= Security returns for the year,
   E_{it} = operating earnings
   CFO_{it} = operating cash flows for firm i in period t,
    Δ denotes the change in a variable,
    e_{it} is the error term for firm i in period t
    D is a dummy variable taking a value of one when earnings are transitory and zero otherwise.

Consistent with prior related studies by Cheng et al. (1996), Charitou et al., (2000) and Charitou, (2010), two alternative definitions are used to determine D. Under one approach, D equals 1 (0) when $| \Delta E_{it}/ P_{it-1} |$ is greater than (less than) its yearly cross-sectional median. Under the second approach, firms are ranked each year according to their E_{it}/ P_{it-1} , placing firms with positive E_{it}/ P_{it-1} into the first nine groups with equal number of firms per group and firms with negative earnings in the tenth group. Earnings are classified in the bottom two and top two groups as transitory (D=1) and earnings in the middle six groups as permanent (D=0).

4.0 EMPIRICAL RESULTS

In this section we present empirical results in order to support the propositions of this study. Empirical results that will be presented in this section relate to descriptive statistics, univariate analysis and multivariate analysis.

Table 1 presents descriptive statistics for all earnings, cash flows and security returns variables examined in the study for both countries, namely, USA and France for all years tested. Results indicate the following: a) the mean security return for USA is the highest (0.08), whereas in France is somewhat lower, 0.06, b) the mean earnings level is higher for France and lower for USA. For the French dataset the mean of earnings levels is 0.04; c) the mean of the cash flow levels is shown to be the highest for the French dataset (0.18) and lower for USA (0.06). These results are consistent with our expectations.

In table 2 we present univariate analysis results. Results indicate the following. First, as far as the value relevance of earnings is concerned, as expected, results indicate earnings are positive and statistically significant in both countries. Interestingly, the size of the earnings variable is approximately equal in both countries, in spite of the fact that the French financial reporting system is much more conservative. Specifically, the coefficients of the level of earnings are 0.76 and 0.79 for the USA and France, respectively. As far as the R^2 is concerned, results indicate that French earnings are more value relevant than the earnings in the USA, even though the financial reporting system in France in more conservative. The R^2 for the level of earnings is 11.20% and 6.70% for France and USA, respectively.

As far as the value relevance of cash flows is concerned, as expected, results indicate that cash flows are value relevant in both countries. The coefficients of the cash flows are positive and statistically significant. The size of the coefficients of cash flows as well as the magnitude of the R^2 is somewhat higher in the USA, suggesting that cash flows could be less value relevant in France. Moreover, as it was expected the size of the earnings coefficients and the magnitude of the R^2 are relatively higher than the equivalent cash flow statistics. These results are consistent with our expectations. This is due to the fact that earnings are considered more informative in the stock markets.

In this study we hypothesize that the value relevance of earnings decreases when earnings are volatile and thus, the value relevance of cash flows is expected to improve in both countries when earnings are more volatile. Results in Table 3 provide evidence to support our hypothesis, that is, when earnings are transitory the role of earnings in stock markets decreases and the role of cash flows improves.

Consistent with prior studies, we included in the multivariate regression model in Table 3 both the level and changes of earnings and cash flows, in order to capture the unexpected components of these variables. This is done in order to test the hypothesis that when earnings are transitory the earnings response coefficients on both levels and changes will have reduced significance in explaining security returns. In this situation the importance of cash flows from operations is expected to be greater. Thus, in the model in Table 3, the coefficients $k_{1t} + k_{2t}$ and $k_{3t} + c_{4t}$ represent the estimates of the earnings and cash flow response coefficients when earnings are more stable. The coefficients $k_{5t} + k_{6t}$ and $k_{7t} + c_{8t}$ capture the additional value relevance of earnings and cash flows for firms with primarily volatile earnings. It is expected that $k_{5t} + k_{6t}$ to be negative and $k_{7t} + k_{8t}$ to be positive.

Specifically, results in Table 3 indicate the following. First, as expected, the sum of the coefficients of earnings $(k_3 + k_4)$ is positive and statistically significant in both USA and France. These results indicate that in both countries, the earnings are taken into consideration in the valuation of stock prices by security analysts and investors. Second, as expected, the sum of the coefficients of cash flows is positive and statistically significant. Again, these results show that cash flows are important to security analysts and investors in the USA and France for stock valuation purposes. These results are consistent with the results provided thus far in all previous models. Third, the sum of the coefficients of earnings $k_5 + k_6$ is negative

and statistically significant in the USA and France. These results are consistent with our expectations. These results mean that when earnings are volatile, i.e. when the variation of the earnings compare to stock prices is relatively high (in the present study above its median), then the stock market does not perceive this information as good news and the relative importance of earnings on stock prices decreases. This is measured by the sum of the coefficients of $(k_1+k_2) + (k_5+k_6)$. As far as the USA and France is concerned results are consistent with our expectations. Specifically, in the USA results indicate that when earnings are more stable the effect of earnings on stock prices is 5.88 (k_1+k_2), but when earnings are more volatile, then the effect of earnings on stock prices is only 1.08 (i.e. 5.88 minus 4.8 or $k1+k_2$ minus k_5+k_6). Results in France also support the US results. French results in Table 3 indicate that when earnings are more stable, the effect of earnings on stock prices is 5.66 (k_1+k_2), but when earnings are more volatile, then the effect of earnings on stock prices is only 1.15 (ie., 5.66 minus 4.51 or (k_1+k_2) minus (k_5+k_6).

Fourth, as hypothesised, results in Table 3 support that the cash flow variables are taken into consideration by investors in investment decisions. Specifically, the sum of the coefficients of cash flows k_3+k_4 is positive and statistically significant in both countries. For example, in the USA it is 0.10 and in France is 0.18.

Fifth, as hypothesised, results in Table 3 support that when earnings are more volatile, investors and security analysts in the USA pay more attention to cash flows. This is evidenced by the sum of the coefficients of cash flows k_7+k_8. For example, in the USA, when earnings are volatile, stock prices are affected by 0.02 more from changes in cash flows. These results are very interesting because they show that in Anglo-Saxon countries, such as the USA, investors do pay additional attention to cash flows because they do know that earnings are of lower value when they are volatile. On the other hand, consistent with prior evidence in previous models and tables of this study, French analysts and investors pay more attention to earnings because their code law system makes financial reporting in France much more conservative, and thus the variability of earnings is not that high as the variability of earnings in the USA.

Sixth, in both USA and France, results support that the model is statistically significant and the variation of stock returns as explained by the R^2 is 12.8% in the USA and 17.2% in France. In summary, results presented in Table 3 support our hypothesis, i.e., that when earnings are more volatile, investors pay less attention to earnings and more attention to cash flows.

5.0 CONCLUSIONS

Consistent with our hypothesis and our expectations, the results of this study indicate that earnings and cash flow information is country specific, that is investors and financial analysts pay different attention to earnings and cash flows depending on the country under investigation and on whether earnings are volatile or not. Specifically, results indicate that earnings and cash flows are perceived differently by investors, depending on the country to which they belong to. When earnings are volatile, investors in Anglo-Saxon countries penalize more these firms because the effect of earnings on stock returns is much more negative.

The results of this study have practical implications as well and should be of great importance to the major stakeholders such as investors, creditors, financial analysts, especially with the latest events that are taking place, and the major collapses of giant organizations worldwide such as Lehman Brothers, General Motors, Kodak, among others. Regulatory bodies, investors, financial analysts and the financial press, blamed among others, the possible manipulation of financial information supplied to the investors by these organizations. The question raised, is whether this type of information is taken into consideration by investors in their investment decisions.

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Table 1 : Descriptive Statistics
In this table we present descriptive statistics for all years tested for all firms for USA and France, where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in operating Cash flows; RET: annual security returns.

COUNTRY	VARIABLE	MEAN	MEDIAN	LOWER QUARTILE	UPPER QUARTILE
USA	E	-0.01	0.04	-0.05	0.08
	ΔE	0.01	0.05	-0.04	0.04
	CFO	0.06	0.08	-0.04	0.14
	ΔCFO	0.01	0.01	-0.06	0.07
	RET	0.08	0.01	-0.29	0.34
FRANCE	E	0.06	0.07	0.05	0.10
	ΔE	0.01	0.01	-0.02	0.03
	CFO	0.18	0.13	0.06	0.26
	ΔCFO	0.01	0.01	-0.08	0.10
	RET	0.06	0.03	-0.15	0.25

Table 2:
Univariate regression analysis results for all years tested for USA and France.

In this table we present univariate regression analysis results for all years tested for USA and France.
Model: RET = $k_0 + k_1$ Xi, where Xi is the independent variable E and CFO.
where E: operating earnings, CFO: Operating cash flows, RET: annual security returns.
All Independent variables (E, CFO) are deflated by the market value of the firm at fiscal year end of the previous year. *, **, *** Statistically significant at a=1%, 5% and 10% respectively

Xi	USA	FRANCE
E		
Coefficient	0.76 *	0.79 *
P-value	0.00	0.00
F-value	2587 *	148*
R^2 Adj	6.7%	11.2%
CFO		
Coefficient	0.45 *	0.20 *
P-value	0.00	0.00
F-value	1198 *	26 *
R^2 Adj	3.2%	2.1%

Table 3
Multivariate regression analysis results for all years for all firms for the USA and France when earnings are transitory.

In this table we present Multivariate regression analysis results for all years for all USA and French firms when earnings are transitory. Earnings are transitory if DE / Pt-1 is above median, and permanent if DE / Pt-1 is below median. Where E: operating earnings, DE: change in earnings, CFO: operating cash flows, DCFO= change in operating earnings, RET= security returns, D: dummy variable that takes the value of 1 if earnings are transitory and it takes the value of zero if earnings are permanent. *, **, *** Statistically significant at a= 0.01, 0.05 and 0.10 respectively

Model $RET_{it} = k_0 + k_1 E_{it} + k_2 DE_{it} + k_3 CFO_{it} + k_4 DCFO_{it} + k_5 E_{it}*D + k_6 DE_{it}*D + k_7 CFO_{it}*D + k_8 DCFO_{it}*D + e_{it}$

	Constant	E	ΔE	CFO	ΔCFO	D*E	D*ΔE	D*CFO	D*ΔCFO	E+ΔE	CFO+ΔCF	D*E+D*ΔE	D*CFO+D*ΔCFO	
	k0	k1	k2	k3	k4	k5	k6	k7	k8	k1+k2	k3+k4	k5+k6	k7+k8	R^2 %
USA	0.10	0.35	5.53	0.15	-0.06	0.16	-4.96	0.13	-0.11	5.88	0.10	-4.80	0.02	12.8
	(22.3)*	(5.2)*	(22.7)*	(3.53)*	(-1.45)	(2.17)**	(-20.7)*	(2.76)*	(-0.73)	(24.1)*	(2.63)*	(-21.2)*	-1.68	
FRANCE	0.01	1.23	4.43	0.12	0.06	-0.41	-4.10	0.06	-0.07	5.66	0.18	-4.51	-0.01	17.2
	-0.63	(4.72)*	(4.36)*	-1.41	-0.73	(-1.6)*	(-3,88)*	-0.60	(-0.1)	(5.72)*	(2.01)**	(-4.56)*	(-0.64)	