Equity valuation models and target price accuracy in Europe: Evidence from equity reports

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ABSTRACT

This study examines whether European investment analysts prefer cash flow based valuation models over accrual based models, how accurate valuation models are and whether the use of cash flow based models (with or without accrual based models) improve forecast accuracy. We conduct a comprehensive content analysis of equity research reports for most of the firms on the components list of the Dow Jones Euro Stoxx 50 Index. We find that earnings multiples and the discounted cash flow (DCF) valuation models are the two most popular valuation models and the use of accrual based multiple alongside a cash flow based model improves the forecast error and this is in line with the intuition that accruals add value relevant information to cash flows. However, we also find that neither cash flow nor earnings multiples are superior to book value and return on equity (ROE) based models in terms of forecast error. Our results provide support for the use of book value and ROE based models which provide more precise forecasts and this, in turn, supports the use of accounting based models, i.e., a residual income model.

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1. Introduction

Academic research typically argues that earnings are more *relevant* than cash flows for assessing company performance. On the other hand, it is also argued in the literature that cash flows may be more *reliable* than earnings because accruals require judgement and estimation. The use of cash flow as an alternative metric has gained increasing popularity in the literature (Call, Chen, & Tong, 2009; Dechow, 1994; DeFond & Hung, 2003; Givoly, Hayn, & Lehavy, 2009; Sloan, 1996). Recently Akbar, Shah, and Stark (2011) indicate that cash flows can have incremental value relevance relative to either earnings or fund flows and Call et al. (2009) suggest that analysts' earnings forecasts issued with cash flow forecasts are more accurate than those not accompanied by cash flow forecasts. The notion that cash flows are useful in validating the information in earnings that contain large accruals is consistent with Penman (2001, 2007) and Penman and Yehuda (2009).[1] Penman (2001)

suggests with regard to the application of valuation models that 'the practical issue is what accounting — cash flow accounting in discounted cash flow models or accrual accounting in so called residual income models — best provides a base to which a growth rate can be applied'.

In this study, we examine whether European investment analysts prefer cash flow based valuation models over accrual based models, which valuation models provide small forecast error, and whether the use of cash flow based models (with or without accrual based models) improves the target price accuracy. Analysts are important intermediaries in the capital markets. They provide earnings forecasts, recommendations and target prices and previous research finds that these are important in share price formation (Asquith, Mikhail, & Au, 2005). Analysts work in equity research departments of brokerage firms and generate commissions for their employers either by selling information through their equity research reports or through increased trading (Bradshaw, 2011; Juergens & Lindsey, 2009; Schipper, 1991 among others). One of the main contents of an analyst's report is target price which shows analysts' expectation of share price of a particular company in 12 months time. There is evidence that investment analysts use target prices to justify their recommendations (Bradshaw, 2002) and that analysts' target prices are useful to investors (Brav & Lehavy, 2003). Another stream of literature investigates analysts' preferences of valuation models in the UK (Demirakos, Strong, & Walker, 2004; Imam, Barker, & Clubb, 2008) and finds that analysts use both earnings based and cash flow based models, although multi-period accounting based models are not

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[1] In the conceptual framework, the International Accounting Standards Board (IASB) states that the primary users (present and potential investors, lenders and other creditors) of financial reporting need information about the resources of the entity to assess an entity's prospects for future net cash inflows. The framework also confirms that general purpose financial reports cannot provide all the information that users may need to make economic decisions.

very popular among analysts.[2] However, there is little direct evidence on whether the use of cash flow based models and/or accrual based models result in larger or smaller price forecast error. In this paper, we focus on target price forecast error as there are numerous papers available on earnings forecasts and recommendations but less so on target price forecast error (Bradshaw, 2011).

Previous studies on valuation models accuracy either examine the absolute and relative valuation accuracy of valuation multiples (Deng, Easton, & Yeo, 2009; Lie & Lie, 2002; Liu, Nissim, & Thomas, 2002a) or multi-period valuation models (Francis, Olsson, & Oswald, 2000; Lundholm & O'Keefe, 2001; Penman & Sougiannis, 1998). However, we are not aware of any study which examines the price forecast error of multi-period valuation models as well as multiples. We also consider valuation precision of the return on equity (ROE) based model in this study.

In addition, the research in this area has a focus either on the US (Block, 1999; Bradshaw, 2002) or the UK (Demirakos, Strong, & Walker, 2010; Demirakos et al., 2004; Imam et al., 2008), with limited evidence on other European markets. We believe cross-country differences are important as previous studies find that value relevance of accounting numbers vary significantly between countries due to the legal systems (Ball, Kothari, & Robin, 2000; La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997, 1998) and the level of alignment of financial and tax accounting (Ali & Hwang, 2000).[3] For instance, Bartov, Goldberg, and Kim (2001) find that explanatory power of earnings and cash flows are substantially lower in Japan and Germany than in the Anglo-Saxon countries and that earnings are superior to cash flows in explaining share returns in the US and the UK but the reverse is true for Japan and Germany. Alford, Jones, Leftwich, and Zmijewski (1993) and Ali and Hwang (2000) suggest that value relevance of accounting numbers is lower for Continental model than for British–American model countries and in bank oriented economies than in market oriented economies. Consistent with these findings, Liu, Nissim, and Thomas (2002b) show that there is considerable variation in the performance of actual earnings per share (EPS) across countries mainly due to legal and accounting differences. The US and the UK data show higher value relevance earnings than other countries in their sample. The precision of valuation based on actual EPS in Canada, Germany and Japan is very low and the performance of earnings multiples in France is quite good. Danbolt and Rees's (2001) findings on six European countries (France, Germany, Italy, the Netherlands, Switzerland, and the UK) reveal that accounting based models of market to book work relatively well for financial firms and that value relevance of earnings is higher in countries like the Netherlands, the UK and Italy than the other three countries of their sample. Equally, Arce and Mora (2002) conclude that earnings are more relevant than book value in Common Law countries (e.g. Canada) and vice versa for Code Law countries (e.g. Germany).

Since previous studies show that value relevance of accounting numbers and valuation precision of multiples differs across countries, we expect that analysts in European countries have different preferences with regard to valuation models than Anglo-Saxon economies. In this study, we cover five major European economies: France, Germany, Italy, the Netherlands and Spain. We believe our study contributes to the knowledge of valuation models usage and accuracy of models in non-Anglo-Saxon based economies which are not explored previously.

We aim to extend and contribute to the recent literature on the use of valuation models by investment analysts in five European countries, by using a content analysis approach similar to Demirakos et al. (2004). The research questions are: (i) whether a cash flow based or accrual based model is the most popular valuation model used by analysts in Europe; (ii) which model(s) produces less price forecast error; and (iii) does the use of accrual based model(s) alongside cash flow based model(s) provide better forecasts than using these models alone?

We test a number of hypotheses and conclude that earnings multiples (EM) and the discounted cash flow (DCF) valuation model are the two most popular valuation models by European analysts. We also show that book value and return on equity (ROE) based models generally generate more precise estimates than earnings multiples (EM), sales multiples (SM) and even multi-period models (i.e. the DCF). This result suggests that though a multiple based valuation approach bypasses detailed forecasts and is often used as a substitute for multi-period models, multiple based models outperform multi-period models in terms of forecast error.[4] Our results also suggest that a change has in fact taken place in recent years in Europe, with a greater emphasis on sophisticated DCF for non-financial and ROE based models for financial sectors, perhaps driven by the post-2000 stock market collapse and subsequent prolonged bear market, and by heavy criticism of the research quality of investment analysts.

Overall, this study provides an indication of which accounting variables (e.g. cash flow, earnings, book value) are important to determine the value of companies in Europe. Indeed our results are important as they show that accruals add value relevant information to the market. Our results also show that simple multiple based models complement multi-period models well in forecasting. Finally, although the residual income model is not a popular model among analysts, as evident in previous studies (Demirakos et al., 2004; Imam et al., 2008), the ROE based model and the book value multiples that analysts use have the same principles of residual income model and outperform all other models. Therefore, the result could motivate investors, academics and analysts to use an accounting based model, i.e. a residual income model more, as an alternative to the DCF. Our results should also be of interest to investors since we show that joint use of publicly available earnings and cash flow forecasts with inexpensive heuristics could help them to have accurate forecasts for firms' future price.

The paper is organised as follows. Section 2 presents the literature review. Section 3 discusses research design. Section 4 presents empirical models and hypotheses. Section 5 presents findings followed by a discussion in Section 6. Section 7 concludes the paper.

2. Literature review

Valuation models have been the subject of considerable empirical research in recent years. Theory suggests that all models should give identical valuations if they are properly constructed. However, the relative superiority of alternative valuation models in practice and in academic research is an unresolved issue. Penman and Sougiannis (1998) provide evidence that the residual income model (RI) model yields more accurate firm estimates than the dividend discount model (DDM) and the discounted cash flow (DCF) approach. The debate between Penman (2001) and Lundholm and O'Keefe (2001) ultimately suggests that in theory there is no difference between the DCF and the RI and both are equivalent to the DDM and also indicates that these models generally provide significant explanatory power for share prices. Equally, Francis et al. (2000) compare the accuracy of the DDM, DCF, and RI and reveal that the RI is superior to the other two. They find that the RI is significantly more accurate (absolute prediction error is 30%) than the DCF and the DDM (41% and 69%, respectively) and also that the RI explains a much longer portion of the market price variation (71% explanatory power as opposed to 51% for the DCF and 35% for the DDM). Recently, Demirakos et al. (2010) suggest that earnings multiples outperform DCF models. Equally, Nissim (2011) find that for US insurance companies, book value multiples perform relatively well and conditioning the book value multiples on ROE significantly improves the valuation

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[2] DeFond and Hung (2003) show that analysts started to provide cash flow forecasts in addition to earnings forecasts in the 1990s.

[3] Prior research examines the association between share price and a set of accounting variables such as earnings, cash flow (or dividends) and book value. The overall conclusion is that the value relevance of accounting information has decreased over time (Collins, Maydew, & Weiss, 1997; Francis & Schipper, 1999; Lev & Zarowin, 1999).

[4] Asquith et al. (2005) reveal that almost all analysts' reports of their sample have multiple based valuation analysis.