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Implications of the cash component of earnings for earnings persistence and stock returns☆

Panagiotis G. Artikis, Georgios A. Papanastasopoulos*

Department of Business Administration, University of Piraeus, 80 Karaoli & Dimitriou Street, 18534, Piraeus, Greece

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ABSTRACT

The main objective of this paper is to examine the persistence, pricing and economic significance of the cash component of earnings in U.K. listed firms from 1981 to 2013. In so doing, we break down the cash component of earnings into changes in the cash balance and into issuances/distributions to debtholders and equity holders. We find that the cash component of earnings is more persistent than the accrual component and that this higher persistence can be attributed primarily to cash distributed to equity holders. Cash retained by the firm as changes in the cash balance also appears to be more persistent than accruals, whereas cash attributed to debtholders has approximately the same persistence level as accruals. The results from our pricing models support the naïve investor hypothesis and show both that future stock returns have the strongest positive correlation with the most persistent cash subcomponent of earnings and that investors can devise a profitable investment strategy by investing in companies that have high cash distributions to equity holders. Our results are consistent across subperiods – when controlling for changes in financial reporting standards and the economic environment – and across different size groupings.

1. Introduction

The capital market-based accounting literature has generally focused on accruals, examining their relative persistence (Richardson, Sloan, Soliman, & Tuna, 2005, 2006; Sloan, 1996), the implications they have for future stock price performance (Callen, Khan, & Lu, 2013; Ecker, Francis, Kim, Olsson, & Schipper, 2006; Richardson et al., 2005) and whether they can be used as a basis for forming a separate risk factor (Core, Guay, & Verdi, 2008; Francis, LaFond, Olsson, & Schipper, 2005; Kim & Qi, 2010; Mashruwala & Mashruwala, 2011; Ogneva, 2012).

The seminal paper in this field is Sloan (1996), who finds that the accrual component of earnings exhibits different levels of persistence than the cash flow component because of accruals' greater subjectivity and investors' failure to fully appreciate the variety of implications accruals have for future profitability.[1] Xie (2001) decomposes accruals into their discretionary and non-discretionary components and proposes that the lower persistence of accruals is due to earnings manipulation, even

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* Corresponding author.
E-mail addresses: partikis@unipi.gr (P.G. Artikis), papanast@unipi.gr (G.A. Papanastasopoulos).

[1] Hewitt (2009) finds that both professional analysts and nonprofessional investors fixate on earnings and have difficulty separating cash flows from accruals in financial statements.

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after controlling for sales growth. Dechow and Dichev (2002) develop an empirical measure of accrual quality and show that it is positively related to earnings persistence. Fairfield, Whisenant, and Yohn (2003) claim that Sloan's (1996) findings are in fact a subset of a more general growth effect that can be explained by diminishing marginal returns to new investment and/or conservative accounting. Hanlon (2005) examines the persistence of earnings accruals along with the role of book-tax differences and finds that firms with large book-tax differences have lower earnings persistence, even after controlling for the special-items effect.

Dechow, Richardson, and Sloan (2008) are the first to shift the focus from the accrual to the cash flow component of earnings. These authors decompose the cash component of earnings into retained cash flows (i.e., changes in cash holdings), cash flows relating to debt financing activities and cash flows relating to equity financing activities. Dechow et al. (2008) find that the higher persistence of the cash component is entirely attributable to net cash flows that are distributed to equity holders, whereas the other two cash subcomponents of earnings exhibit the same level of persistence as accruals. Their results also suggest that investors correctly price debt and equity issuances/distributions but misprice changes in the cash balance in a similar manner to accruals.

Chen and Shane (2014) extend the work of Dechow et al. (2008) by decomposing retained cash flows into normal (fundamentals-driven) changes in cash and abnormal (agency-related) changes in cash. These authors show that positive (negative) abnormal changes in cash have lower (greater) persistence than positive (negative) normal changes in cash. Chen and Shane (2014) offer evidence that investors rationally price suboptimal increases in the cash balance. However, these authors also find substantial support for market mispricing of negative changes in cash, regardless of whether these changes are normal or abnormal.

In this paper, we seek to provide insights into the persistence and pricing of the cash component of earnings outside the U.S. As Barton, Hansen, and Pownall (2010) argue, the implications of accounting figures might vary across different markets and therefore cannot be identified merely from the study of a single (U.S.) market. Consequently, in a world with cross-country variation in institutional conditions, it is important to understand the implications of accounting numbers in as many countries as possible. In so doing, we can avoid the data-snooping problem highlighted in Lo and MacKinlay (1990).

We focus on the U.K. because it is home to the oldest and one of the three largest stock exchanges in the world in terms of total capitalization. Thus, the London Stock Exchange represents a useful alternative source of data to the much-studied U.S. markets. Further, despite some similarities between the U.S. and the U.K. stock market, such as their legal origin, the level of permission to use accrual accounting and share ownership concentration (see Pope & Walker, 1999), there are many differences between the two markets. Indeed, there are differences in accounting standards,[2] as the U.S. reporting system is more conservative and less flexible, whereas U.K. GAAP tends to lead companies to report higher earnings (see Weetman & Gray, 1991; Weetman, Jones, Adams, & Gray, 1998). There are also differences in corporate governance relating to the composition of boards of directors (Monks & Minow, 2004), executive compensation (Coffee, 2005), appointment of auditors (Turnbull, 2005), etc. Accordingly, Hofstede (2001) highlights a number of organizational differences, whereas Soares and Stark (2009) emphasize the education and training backgrounds of market participants. Regarding managerial practices, the current evidence indicates that management can exercise greater discretion over earnings in the U.S. than in the U.K. (Brown & Higgins, 2001; Wright, Shaw, & Guan, 2006).

Notably, the above-mentioned institutional differences might affect empirical regularities attributable to accounting figures. Consider, for instance, the accrual anomaly. In the U.S., the anomaly is found to be robust to different sample periods (Lev & Nissim, 2006), alternative definitions of accruals (Richardson et al. 2005; Sloan, 1996), the inclusion of Nasdaq firms (Lev & Nissim, 2006), and considerations of additional risk factors (Chan, Chan, Jegadeesh, & Lakonishok, 2006; Hirshleifer, Hou, & Teoh, 2012). However, evidence regarding the accrual anomaly in the U.K. is mixed. On one hand, Chan et al. (2006) and Pincus, Rajgopal, and Venkatachalam (2007) show that investors misprice working capital accruals. On the other hand, Soares and Stark (2009) offer evidence that shows that the accrual anomaly is confined to small companies with high accruals and is unexploitable once transaction costs are taken into account. Hence, it remains unclear whether and to what extent empirical regularities attributable to the cash component of earnings identified in the U.S. are applicable to the U.K.

Another reason to focus on the U.K. derives from the fact that during the last three decades, several significant events have affected the financial reporting environment and the structure of the stock market. With regard to the financial reporting environment, significant changes resulted from the introduction of FRS 3 in 1992 and mandatory adoption of the IFRS in 2005.[3] Thus, it is questionable whether the greater transparency of accounting information from these changes improved investors' ability to assess a company's future performance prospects and whether it led to less mispricing of accounting figures such as earnings, accruals and cash flows. Consistent with this line of reasoning, Chan, Lee, and Lin (2009) report a decrease in the accrual anomaly following the application of FRS 3 in the U.K. In a similar vein, Papanastasopoulos (2015) shows that return predictability associated with accruals attributable to accounting distortions is largely attenuated and has become statistically insignificant at conventional levels following mandatory adoption of FRS 3 in the U.K.

The issues in the relevant literature outlined above have spurred us to examine the persistence and pricing of the cash component of earnings in a sample of U.K. listed firms from 1981 to 2013. We need to stress here that, while there is a large body of literature examining the implications of accrued earnings on corporate performance for U.K. firms (see Chan et al.

[2] See Iatridis (2011) for a comprehensive review on U.K. accounting disclosure and accounting quality.

[3] See Iatridis (2008, 2010) for a comprehensive review of the impact of the IFRS on the quality of U.K. accounting information.

2006; Chan et al. 2009; Pincus et al. 2007; Papanastasopoulos, 2015; Soares & Stark, 2009 among others), we are not aware of any study up to date examining the implications of cash earnings for future profitability and stocks returns. Thus, in doing so, we extend the existing literature on the properties of accounting figures, by heightening the attention from the accrual to the cash flow component of earnings. The U.K. represents a unique setting with plentiful data, significant variation from the U.S. institutional structure, and major changes in the financial reporting environment during the period of our study.

We distinguish our work from the prior literature (e.g., Chen & Shane, 2014; Dechow et al. 2008) by investigating the incremental association of the cash component of earnings with the future profitability and stock returns after controlling for the level of current profitability. In so doing, we examine whether firms with similar profitabilities in the current year experience higher or lower near-future profitability and stock returns due to greater cash earnings.[4]

We also extend the methodology in this field regarding the estimation of research models by considering not only the actual level of the independent variables but also the decile rankings of the independent variables. The advantage of the latter approach is that it controls for potential non-linearity and ensures that the results are not driven by extreme outliers (Desai, Rajgopal, & Venkatachalam, 2004).

Furthermore, we examine the pervasiveness of our portfolio results across different size groupings (see Fama & French, 2008). In so doing, we investigate whether portfolio results are driven by micro caps. This possibility casts doubt over the attainability of trading returns because micro caps tend to be illiquid and subject to both high trading costs and market-microstructure problems.

Additionally, we separate our portfolio analysis by sample period into the subperiod before the recent global financial crisis (up to 2007) and the subperiod after the crisis (after 2007). In so doing, we are able to investigate whether there is any significant difference in return predictability between the two subperiods.

To sum up, by adopting a cross-sectional framework combined with the use of U.K. data and the consideration of several estimation procedures, we aim to gain a deeper understanding of the implications that the cash components of earnings have for future earnings and for stock price performance. Nonetheless, we also perform subsample analyses conditioned on certain major events affecting the U.K. institutional environment (i.e., the introduction of FRS 3 in 1992 and the mandatory adoption of the IFRS in 2005).

Following Dechow et al. (2008), we focus on a definition of the free cash flows of a firm that excludes all accruals associated with investing/operating activities and decompose free cash flows into changes in the cash balance and short-term investments, on one hand, and distributions/issuances to debtholders and equity holders, on the other.

The first cash subcomponent of earnings, changes in cash and short-term investments – together with the accrual component of earnings – represents the portion of earnings retained by the firm, whereas the other two cash subcomponents of earnings, distributions/issuances to debtholders and equity holders represent the portion of earnings that is distributed to stakeholders. Thus, our methodology allows us to examine the possible relations between the component of earnings that is associated with the return of changes in net investment and in the cash component of earnings that is associated with external financing activities.

The results show that there may be systematic differences among the distinct cash subcomponents of earnings with respect to persistence. Retained cash flows in the form of changes in the cash balance have higher persistence than accruals; however, investors tend to price them correctly. This finding contrasts with the evidence from Dechow et al. (2008) derived from a sample of U.S. firms that shows that changes in cash holdings exhibit lower persistence that is almost identical to that of accruals, which indicates that investors misprice such cash holdings as they do accruals. Thus, as suggested by capital rationing theory, higher cash balances in the U.K. might lead to optimal investment by firm executives and consequently improve earnings performance.

In the case of cash distributed to stakeholders, we find high levels of persistence only with respect to the cash subcomponent attributed to equity holders. This finding is consistent with the high signalling nature (with respect to future profitability) of issuance/distributions of equity (Bartov, 1991; Fenn & Liang, 2001). The cash subcomponent attributed to debtholders exhibits a persistence that is almost identical to that of accruals. Similar findings are reported by Dechow et al. (2008) for U.S. firms. Thus, the implications of cash distributions to stakeholders for future earnings performance can be generalized to the U.K.

We find that investors undervalue the persistence of cash distributed to stakeholders, which is the opposite finding of Dechow et al. (2008), who show that U.S. investors correctly anticipate the persistence of cash distributions to debtholders and equity holders. Our findings are consistent with the so-called "external financing anomaly", which posits that activities raising (distributing) capital are associated with low (high) future returns.[5] Finally, an investment strategy that takes long (short) positions in firms with high (low) cash distributions to either debtholders or equity holders produces positive future raw and abnormal returns. These results are consistent across different subperiods (as distinguished by changes in financial reporting standards and the broader economic environment) and across size groupings (where micro and small cap stocks are

[4] See the similar argument developed in Fairfield et al. (2003, pp. 362), who study the implications of accrued earnings and growth for future earnings and stock price performance.

[5] See Ikenberry, Lakonishok, & Vermelean, 1995; Loughran & Ritter, 1995; Spiess & Affleck-Graves, 1999; Daniel & Titman, 2006; Bradshaw, Richardson, & Sloan, 2006; Pontiff & Woodgate, 2008; Fama & French, 2008; Papanastasopoulos, Thomakos, & Wang, 2011.

responsible to a larger degree for the hedge returns earned and subperiods). Thus, our findings suggest that cash flows distributed to stakeholders have different implications for future stock price performance in the U.K. than in the U.S.

The remainder of this paper is organized as follows. Section 2 describes the sample, sets forth the research hypotheses and details the research methodology. Section 3 presents and discusses the results obtained from the empirical analysis. Finally, Section 4 concludes.

2. Research design

2.1. Dataset

Our sample covers all U.K. common stocks that are listed on the London Stock Exchange. We collect all accounting and market-based data from Worldscope and Datastream International for the 1981–2013 period. Financial firms are excluded because the distinction between operating and financing activities is not clear for these firms. Further, we restrict our sample to firm-year observations without missing data to compute our primary variables of interest: current earnings and one-year-ahead earnings, cash components of earnings and one-year-ahead raw and abnormal returns. These criteria yield a final sample size of 24,731 firm-year observations.

2.2. Measuring the cash component of earnings

Following Dechow et al. (2008), we use the indirect (balance sheet)[6] method to measure the cash component and cash subcomponents of earnings. To better understand this method of measuring earnings components, we set forth the balance sheet identity, according to which total assets (TAs) are equal to total liabilities (TLs) and total shareholder equity (TE):

$$TA = TL + TE \tag{1}$$

We next distinguish operating assets (OAs) and operating liabilities (OLs) from financial assets (FAs) and financial liabilities (FLs). The difference between operating assets and operating liabilities constitutes the net operating asset position (NOA) of a firm. We must simultaneously stress that the primary financial asset consists of cash and short-term investments (CA) and the primary financial liability is total debt (TD). Substituting the above variables in equation (1), we obtain the following:

$$TE = NOA + CA - TD \tag{2}$$

The above equation in first differences (denoted by Δ) is as follows:

$$\Delta TE = \Delta NOA + \Delta CA - \Delta TD \tag{3}$$

As noted by Richardson et al. (2005, 2006), the change in net operating assets represents the accrual component of earnings (ACCs). Further, the change in total debt equals net financial expense (NFE) minus net non-interest cash distributions to debtholders (DIST_Ds). NFE is the difference between interest expenses and interest revenues, whereas DIST_D is the difference between debt repayments and debt issuances. Moreover, according to clean surplus accounting, change in total equity is equal to net income (NI) minus cash distributions to equity holders (DIST_E). DIST_E is equal to dividends plus stock repurchases minus stock issues. The above analysis can be summarized by the following expressions:

$$\Delta NOA = ACC \tag{4}$$

$$\Delta TD = NFE - DIST\_D \tag{5}$$

$$\Delta TE = NI - DIST\_E \tag{6}$$

Substituting the above equations (i.e., 4, 5 and 6) into equation (3) and assuming that net financial expense is paid in cash, we obtain a decomposition of earnings performance into an accrual component and three cash subcomponents:

$$NI = ACC + \Delta CA + DIST\_D + DIST\_E \tag{7}$$

[6] Hribar and Collins (2002) claim that the balance sheet method of calculating accrual and cash components of earnings might be affected by changes in scale in the presence of mergers and acquisitions. Thus, we conduct robustness checks by using cash flow measures from the cash flow statement and find qualitatively similar results. However, we must stress that cash flow statement data are not available for U.K. companies over the entire sample period of our study. The disclosure of a cash flow statement as a separate component of the financial statements is required in the U.K. by FRS 1 – Cash Flow Statements, beginning in September 1991.

Summing the three cash subcomponents yields free cash flows (FCF). According to Dechow et al. (2008, pp. 538), this definition of free cash flows represents the excess cash generated from operations after taking into account cash required for investments. The three subcomponents show the possible disposition of the cash component of earnings. If free cash flows are positive, the cash surplus can be retained in the cash balance and distributed to capital providers (i.e., debtholders and equity holders). If free cash flows are negative, the cash deficit can be financed from debt issuances, stock issuances and the cash balance. The decomposition of earnings performance into an accrual and a cash flow component is expressed as follows:

$$NI = ACC + FCF \tag{8}$$

At this point, we must stress that in our empirical tests, we deflate earnings and cash components of earnings by average total assets. Table 1 provides a summary of our variable definitions and the associated computations.

2.3. Research hypotheses

It is well documented in the literature that the accrual component of earnings is less persistent than the cash flow component of earnings (e.g., Richardson et al., 2005; Sloan, 1996). Thus, the starting point of our research and the first hypothesis we test is as follows:

H1. The cash flow component of earnings is more persistent than the accrual component of earnings.

Notably, the cash flow component of earnings is typically treated as a homogeneous unit, with the exception of Dechow et al. (2008), who decompose the cash flow component into the retained cash subcomponent and the distributed cash subcomponent. Moving forward to break down the cash component of earnings into the retained cash subcomponent (changes in cash and short-term investments) and the subcomponent distributed to stakeholders (distributions/issuances to debtholders and equity holders), we predict a higher persistence for cash distributions to equity holders. The rationale is that decisions to distribute dividends, whether as cash or stock repurchases, are highly discretionary because managers choose to distribute them only when they expect current profitability to be maintained into the future (Bartov, 1991). In addition, when a company has negative free cash flows that are expected to persist into the future, managers will choose to finance them with equity capital because lenders will not likely be willing to provide the required capital. However, debt payments, which must be made at certain future predetermined points in time, carry relatively little signalling value and are much less discretionary than equity distributions. Thus, cash distributions to equity holders have stronger implications for earnings persistence than cash distributions to debtholders.

Regarding retained cash flows, it should be considered that the cash balance can easily be manipulated. It is common practise for listed firms to increase cash balances on or around those dates (window dressing) on which they are required to report their financial statements (Graham, Harvey, & Rajgopal, 2005). There are numerous cases suggesting that the cash

Table 1
Variable definitions.

Variable	Measurement (W = Worldscope data item)
Total Assets (TA)	W02999
Cash and Cash Equivalents (CA)	W02001
Total Debt (TD)	W03255
Ordinary and Preferred Shares (OPS)	W03995
Minority Interest (MINT)	W03426
Total Equity (TE)	W03501
Average Total Assets (AVTA)	Average value of TA at the beginning and at the end of a financial year
Earnings Performance (NI)	W01551/AVTA
Change in Cash Balance (ΔCASH)	ΔCA/AVTA
Net Cash Distributions to Debt Holders (DIST_D)	-(ΔTD/AVTA)
Net Cash Distributions to Equity Holders (DIST_E)	-(ΔOPS/AVTA)-(ΔMINT/AVTA)+NI
Free Cash Flows	(ΔCASH_DIST_D+DIST_E)
Market Capitalization (MV)	W08001 (measured six months after financial year end).
Book-to-Market Ratio (BV/MV)	MV/TE
Return Index (RI)	RI: The theoretical growth in the value of a sharehold unit of an equity at the closing price applicable on the ex-dividend date.
Monthly Raw Return (r)	ΔRI/RI
Annual One-Year Ahead Raw Return (RET)	RET is calculated using compounded 12-month buy-and-hold returns. The return accumulation period begins six months after financial year-end.
Annual One-Year Ahead Abnormal Return (ARET)	Six months after each financial year-end, firms are first sorted into four quartile portfolios by MV and in each of the resulting quartile portfolios, are further sorted into another four quartile portfolios by BV/MV. This procedure results in 16 benchmark portfolios, and the matching return is the annual one-year-ahead weighted average return for each benchmark portfolio. ARET is the difference between the RET and the matching return of the benchmark portfolio to which the firm belongs.

balance is misstated due to unintentional or intentional accounting errors. At the same time, according to Harford (1999) and Jensen (1986), managers finance negative net present value (NPV) projects using the cash balance. The preceding arguments imply that retained cash flows might have a negative impact on future earnings performance.

However, Myers and Majluf (1984) propose that under the capital rationing theory, high cash balances allow managers to make optimal decisions that are less costly and provide better profitability in the future. In particular, they claim that high cash holdings can benefit a firm by reducing the cost of asymmetry that places a wedge between the costs of internal and external capital. Thus, a priori, the implications of retained cash flows for future profitability are not clear. The above discussion leads to our second research hypothesis:

H2. The higher persistence of the cash flow component of earnings is more likely to be attributable to cash distributions to equity holders.

Next, we compare market efficiency with respect to the various cash components of earnings. If investors naïvely undervalue cash flows when forming earnings expectations, then investors will be positively surprised by the next period's higher profitability for a firm with high current cash flows, resulting in positive movements in stock prices. In other words, the naïve investor hypothesis predicts a positive relation between the cash component of earnings and future stock returns. This positive relation is expected to emerge only for those cash subcomponents that investors undervalue regarding their implications for future earnings performance. To examine whether stock market participants take into account the different levels of persistence of the different cash subcomponents of earnings when they make their investment decisions, we propose the following hypothesis:

H3. The earnings expectations embedded in stock prices fail to fully reflect the relative persistence of the cash components of earnings.

2.4. Measuring stock returns

We calculate stock returns six months after the financial year end, as this is the period within which financial statements are required to be published in the U.K. Stock returns are calculated inclusive of dividends using the return index provided by Datastream (item RI), which is defined as the theoretical growth in the value of a unit of shareholder equity at the closing price applicable on the ex-dividend date. The raw equity return for a firm at month j is calculated as follows: $r_j = RI_{j+1}/RI_j - 1$.[7] Once we obtain firm monthly returns, we calculate the one-year-ahead annual raw stock return (RET_{t+1}) using compounded 12-month buy-and-hold returns.

To measure abnormal returns, we control for size and book-to-market ratio (i.e., size and book-to-market adjusted returns).[8] Size is measured by market capitalization six months after the financial year end, whereas the book-to-market ratio is measured by the ratio of the book value of total equity to market capitalization. For each year, we distribute firms into four equal-weighted portfolios (i.e., quartiles) by market capitalization, and in each of the resulting portfolios, we further distribute firms into another four equal-weighted portfolios by book-to-market ratio. This procedure results in 16 benchmark portfolios, and the matching return is the annual one-year-ahead weighted average return of all firms in the benchmark portfolio. Then, the abnormal return ($ARET_{t+1}$) for a firm is the difference between the raw return (RET_{t+1}) and the matching return of the benchmark portfolio to which the firm belongs.[9]

2.5. Earnings persistence tests

Our first hypothesis suggests that the cash component of earnings is expected to be more persistent than the accrual component of earnings. As the cash component of earnings reflects the difference between earnings performance itself and the accrual component of earnings, this hypothesis can be tested using the following model:

$$NI_{t+1} = \rho_0 + \rho_1(NI_t - FCF_t) + \rho_2 FCF_t + \upsilon_{t+1} \tag{9}$$

where ρ_1 measures the persistence of accruals and ρ_2 measures the persistence of cash flows. Thus, according to the above model, the first hypothesis suggests that $(\rho_2 - \rho_1) > 0$. Note that an equivalent version of the model in Eq. (9) is given by:

$$NI_{t+1} = \rho_0 + \rho_1 NI_t + (\rho_2 - \rho_1)FCF_t + \upsilon_{t+1} \tag{10}$$

Following Richardson et al. (2005), we rewrite the model in equation (10) by setting $\rho_1 = \gamma_1$ and $\gamma_2 = \rho_2 - \rho_1$ as follows:

[7] We impose all the filters suggested by Ince and Porter (2006) and McLean, Pontiff, and Watanabe (2009) to ensure that the calculation of returns does not generate extreme outliers.

[8] Fama and French (2008) argue that size and book-to-market adjusted returns are similar to factor alphas from the Fama and French (1993) three-factor model.

[9] If a firm delists during the period, then the last available return index (RI) before delisting is used to calculate the delisting return, and the proceeds are reinvested in the benchmark portfolio.

$$NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 FCF_t + \upsilon_{t+1} \quad (11)$$

The logic behind the above model is a direct investigation into the relative persistence of the cash component of earnings over the accrual component of earnings. In particular, our first hypothesis suggests that $\gamma_2 > 0$.

Next, we turn to our second hypothesis concerning the relative persistence of cash distributions to equity holders. According to this hypothesis, the higher persistence of the cash component of earnings is more likely to be driven by cash distributions to equity holders. To test this hypothesis, we examine the implications of each cash subcomponent of earnings for future profitability by estimating the following models:

$$NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \upsilon_{t+1} \quad (12)$$

$$NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_D_t + \upsilon_{t+1} \quad (13)$$

$$NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_E_t + \upsilon_{t+1} \quad (14)$$

In each of the above models, γ_1 measures the persistence of earnings exclusive of the respective cash subcomponent of earnings under investigation, whereas γ_2 measures the relative persistence of the respective cash subcomponent of earnings under investigation over all other components of earnings. Our second hypothesis suggests that γ_2 should be higher for the cash component of earnings distributed to equity holders.

Further, we re-examine the second hypothesis using the following model:

$$NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \gamma_3 DIST\_D + \gamma_4 DIST\_E + \upsilon_{t+1} \quad (15)$$

Because the three cash subcomponents sum up to the total cash flow component of earnings, γ_1 measures the persistence of the accrual component of earnings, as in equation (11). At the same time, γ_2, γ_3 and γ_4 measure the relative persistence of the cash component retained by the firm, the cash component distributed to debtholders, and the cash component distributed to equity holders, respectively, over the persistence of the accrual component of earnings. Under the second hypothesis, we expect $\gamma_4 > 0$, $\gamma_4 > \gamma_2$ and $\gamma_4 > \gamma_3$.

We conduct all of our regression analyses following the Fama and MacBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time-series averages of the resulting regression coefficients. In our regression analyses, we use both the actual level and the scaled decile ranking of independent variables. To transform independent variables into scaled decile rankings, we rank the value of each variable into deciles (0–9) for each year and divide the decile number by 9 so that each firm-year observation related to each variable takes a value ranging between 0 and 1. Desai et al. (2004) argue that estimating regressions using scaled decile ranks controls for potential non-linearity and ensures that the results are not driven by extreme outliers.

2.6. Stock return tests

Our third hypothesis concerns whether investors fully understand the implications of the cash component and cash subcomponents of current earnings for future earnings performance. To examine this hypothesis, we estimate the models described in the previous section after replacing the dependent variable with one-year-ahead raw and abnormal returns. For example, to examine whether earnings expectations embedded in stock prices fully reflect the implications of the cash component of earnings, we estimate the following models:

$$RET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 FCF_t + \upsilon_{t+1} \quad (16)$$

$$ARET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 FCF_t + \upsilon_{t+1} \quad (17)$$

If investors understand the implications of the cash flow component of earnings for earnings persistence, then there should be no relation between cash flows and future stock returns. However, if investors naïvely undervalue cash flows when forming earnings expectations, then for a firm with high current cash flows, they will be positively surprised by the one-year-ahead earnings performance for a firm with high current cash flows, resulting in positive stock price movement (i.e., $\gamma_2 > 0$). Thus, the naïve investor hypothesis predicts a positive relation between the cash component of earnings and future stock returns. This positive relation is expected to emerge only for those cash subcomponents that investors undervalue regarding their implications for future earnings performance.

We estimate all regressions with the Fama and MacBeth (1973) procedure using both the actual level and the scaled decile ranking of independent variables. Desai et al. (2004) argue that in scaled decile rank regressions, the slope coefficient can be interpreted as the return to a zero-investment strategy that takes a long (short) position on firms with high (low) levels of the respective independent variable.

In the final part of our work, we investigate the possible economic significance of investors' assessments of the relative persistence attributable to each cash component of earnings. In so doing, we examine the stock price performance of hedge

portfolio strategies based on the magnitude of each cash component of earnings. To this end, we rank firms annually based on each cash component and then allocate them into five equal-sized portfolios (quintiles) based on these ranks. The hedge portfolio consists of a long (short) position in the highest (lowest) portfolio. Then, for each of the resulting quintile portfolios and for the hedge portfolio, we calculate the time-series averages of one-year-ahead raw returns over our sample period.

3. Empirical findings

3.1. Descriptive statistics

Table 2 provides descriptive statistics for the research variables. Panel A reports the mean, median and standard deviation estimates. The mean and median values of FCF are negative, indicating that the cash required for investments is greater than the cash generated from operations for our sample firms during the sample period. In other words, the operating investments of the sample firms are growing, and this growth cannot be financed solely by net income. Turning to the three cash subcomponents of the FCF decomposition, the mean and median values for the change in cash and short-term investments (ΔCASH) are positive, whereas the mean values for the cash flows that are distributed to equity holders (DIST_E) and debtholders (DIST_D) are negative. Thus, the sample firms are financing the expansion of their asset bases by retaining earnings and by raising new capital through both equity and debt issuances.

Examining the standard deviations of the cash subcomponents of the free cash flows allows us to infer their economic significance in the variation of earnings. The standard deviation of the free cash flows is 0.336, which is mainly attributed to the cash flows distributed to equity holders, as this particular subcomponent has the highest standard deviation (0.398) among the three subcomponents. However, the standard deviation of the other two cash subcomponents, cash and short-term investments and cash flows distributed to debtholders, are 0.197 and 0.156, respectively, indicating that they have less relative importance in contributing to the total variation of the free cash flows.

Panel B of Table 2 shows the Pearson and Spearman pair-wise correlations of the research variables. Free cash flows are positively correlated with all cash subcomponents for both correlation statistics, except for cash and short-term investments, which are negatively correlated with free cash flows under the Spearman statistic, which is nonetheless statistically insignificant. The correlation coefficients indicate that all three subcomponents serve as important sources in the variation of free cash flows, with the most important being the distribution to equity holders.

3.2. Earnings persistence results

The empirical results from the earnings persistence tests are reported in Table 3. Model 1 (first column) tests whether the cash component of earnings is more persistent than the accrual component of earnings (first hypothesis). The coefficient of

Table 2
Descriptive statistics.

Part A: Univariate statistics

Variables	Mean	St. Dev	25 th Percentile	Median	75 th Percentile
FCF_t	−0.075	0.336	−0.140	−0.0045	0.084
$\Delta CASH_t$	0.022	0.197	−0.024	0.0013	0.042
$DIST\_D_t$	−0.015	0.156	−0.050	0.000	0.022
$DIST\_E_t$	−0.082	0.398	−0.072	0.009	0.059
NI_t	−0.003	0.252	−0.006	0.048	0.090
NI_{t+1}	−0.012	0.275	−0.014	0.045	0.086
RET_{t+1}	0.107	0.744	−0.248	0.036	0.329
$ARET_{t+1}$	0.006	0.686	−0.286	−0.047	0.200

Part B: Pair-wise correlations – Pearson (Spearman) above (below) diagonal

	FCF_t	$\Delta CASH_t$	$DIST\_D_t$	$DIST\_E_t$	NI_t	NI_{t+1}	RET_{t+1}	$ARET_{t+1}$
FCF_t	–	−0.014	**0.204**	**0.771**	**0.662**	**0.403**	**0.054**	**0.035**
$\Delta CASH_t$	**0.183**	–	**0.030**	**−0.519**	−0.006	−0.009	**−0.064**	**−0.059**
$DIST\_D_t$	**0.486**	−0.011	–	**−0.233**	**−0.107**	**−0.052**	**0.028**	**0.025**
$DIST\_E_t$	**0.665**	**−0.246**	**0.057**	–	**0.604**	**0.366**	**0.066**	**0.049**
NI_t	**0.385**	**0.152**	**−0.049**	**0.336**	–	**0.550**	**−0.007**	**−0.015**
NI_{t+1}	**0.380**	**0.129**	**0.014**	**0.305**	**0.723**	–	**0.065**	**0.037**
RET_{t+1}	**0.162**	−0.001	**0.064**	**0.124**	**0.085**	**0.211**	–	**0.923**
$ARET_{t+1}$	**0.123**	−0.015	**0.059**	**0.095**	**0.037**	**0.133**	**0.801**	–

Table 2 reports univariate statistics (mean, standard deviation, 25th percentile, median, 75th percentile) and correlation statistics (Pearson and Spearman) for the current cash component of earnings, current cash subcomponents of earnings, current and one-year-ahead earnings performance and one-year-ahead raw and abnormal returns. The sample consists of 24,731 annual firm-year observations, covering all firms listed on the London Stock Exchange (except financial firms) with sufficient data to compute financial statement variables and returns using Worldscope and Datastream files over the 1981–2013 period. All variables are defined in Table 1. Bold numbers indicate significant pair-wise correlation at less than the 5% level (2 tailed t-test). Part A provides univariate statistics, whereas Part B shows pair-wise correlations.

Table 3
Cross-sectional regressions of future profitability on cash components of earnings.

Part A: Regressions of one-year-ahead earnings performance on the cash component of earnings and cash subcomponents of earnings, conditional on current earnings performance (based on actual values)

Model 1: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 FCF_t + \upsilon_{t+1}$
Model 2: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \upsilon_{t+1}$
Model 3: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_D_t + \upsilon_{t+1}$
Model 4: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_E_t + \upsilon_{t+1}$
Model 5: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \gamma_3 DIST\_D_t + \gamma_4 DIST\_E_t + \upsilon_{t+1}$

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.0013	−0.0033	−0.0030	−0.0002	0.0012
	0.344	*−0.828*	*−0.744*	*−0.056*	*0.347*
NI	**0.667**	**0.717**	**0.728**	**0.687**	**0.661**
	26.561	***34.186***	***33.518***	***28.636***	***24.607***
FCF	**0.079**				
	8.759				
DCASH		0.017			**0.078**
		1.751			***7.592***
DIST_D			**0.038**		**0.051**
			5.064		***5.149***
DIST_E				**0.048**	**0.085**
				6.686	***7.260***
Adj R^2	0.50	0.49	0.49	0.49	0.49
SER	0.114	0.115	0.115	0.114	0.113
Skewness	−1.437	−1.450	−1.449	−1.433	−1.438
Kurtosis	13.980	14.112	14.149	14.085	13.92
LM	0.011	0.014	0.014	0.012	0.010

Part B: Regressions of one-year-ahead earnings performance on the cash component of earnings and cash subcomponents of earnings, conditional on current earnings performance (based on decile ranks)

Model 1: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 FCF_t^{dec} + \upsilon_{t+1}$
Model 2: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 \Delta CASH_t^{dec} + \upsilon_{t+1}$
Model 3: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 DIST\_D_t^{dec} + \upsilon_{t+1}$
Model 4: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 DIST\_E_t^{dec} + \upsilon_{t+1}$
Model 5: $NI_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 \Delta CASH_t^{dec} + \gamma_3 DIST\_D_t^{dec} + \gamma_4 DIST\_E_t^{dec} + \upsilon_{t+1}$

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	**−0.197**	**−0.171**	**−0.171**	**−0.189**	**−0.205**
	−6.079	***−5.787***	***−6.057***	***−5.850***	***−6.392***
NI	**0.298**	**0.343**	**0.346**	**0.315**	**0.304**
	9.881	***9.272***	***9.308***	***9.639***	***9.746***
FCF	**0.104**				
	7.650				
ΔCASH		0.007			**0.030**
		0.957			***4.045***
DIST_D			0.004		0.005
			0.682		*0.720*
DIST_E				**0.070**	**0.080**
				6.045	***6.457***
Adj R^2	0.34	0.33	0.33	0.33	0.34
SER	0.166	0.168	0.168	0.168	0.167
Skewness	−4.169	−4.136	−4.127	−4.147	−4.157
Kurtosis	64.104	63.106	63.070	63.646	63.368
LM	0.012	0.016	0.017	0.015	0.013

Table 3 reports time-series means and t-statistics (*in italics*) from Fama and MacBeth's (1973) annual cross-sectional regressions of one-year-ahead earnings performance on the current cash component and cash subcomponents of earnings, conditional on the level of current earnings performance. The sample consists of 24,731 annual firm-year observations, covering all firms listed on the London Stock Exchange (except financial firms) with sufficient data to compute financial statement variables and returns using Worldscope and Datastream files over the 1981–2013 period. All variables are defined in Table 1. Bold numbers indicate significance at less than the 5% level (2 tailed t-test). LM is the serial correlation diagnostic test, and SER is the standard error. Part A provides results based on the actual level of independent variables, whereas Part B provides results based on decile rankings of independent variables.

free cash flows is statistically significant and positive for regressions involving both actual values and decile ranks (0.079 and 0.104, respectively). Thus, in line with previous research, we find that the accrual component of earnings is less persistent than the cash flow component of earnings. Models 2, 3 and 4 (second, third and fourth column) test the second hypothesis concerning the relative persistence of cash flows distributed to equity holders and report the results from equations (12)–(14), respectively. The γ_2 coefficients in each of the univariate regressions are consistent with this prediction. Specifically, we find that among the three cash subcomponents, the coefficient of the cash flows distributed to equity holders is not only the largest for both regressions based on actual values and on decile ranks (0.048 and 0.070, respectively) but also that which carries the highest statistical significance. Thus, cash flows distributed to equity holders are the most persistent

component of free cash flows and have a high signalling nature, as set forth by Bartov (1991) and Fenn and Liang (2001). The findings for the cash distributed to equity holders are similar to those reported by Dechow et al. (2008) for U.S. firms. Crossland and Hambrick (2011) find that managerial discretion, i.e., the extent to which managers can influence the actions of their firms, is quite similar in both the U.S. and U.K. Thus, these two countries turn out to exhibit similar levels of persistence for equity distributions, i.e., the payment of dividends, whether in the form of cash or stock repurchases and issuances of stock.

Model 5 allows us to test whether the cash subcomponents related to cash and short-term investments and to distributions to debtholders have a level of persistence similar to accrued earnings. For both regressions (actual values and decile ranks), we find that the coefficient of cash and short-term investment is statistically significant and different from zero, whereas the coefficient of cash distribution to debtholders is statistically insignificant in the case of decile ranks. Thus, cash retained by the company appears to have higher levels of persistence than the accrual component of earnings, which contrasts with the findings of Dechow et al. (2008). This finding might be attributed to differences between the U.S. reporting system and U.K. GAAP, with the former being more conservative and less flexible and to the greater discretion over earnings allowed in the U.S. than in the U.K. However, our results show that cash distributions to debtholders have a low level of persistence, which is similar to that for accruals.

The fifth model also allows us to re-examine the second hypothesis. In both cases (actual and decile values), the results from the univariate regressions are validated, as the coefficient of the cash flows distributed to equity holders is positive and larger than both the coefficient of cash and short-term investments and the coefficient of cash distributed to debtholders for actual values and for decile ranks.

All in all, the above regression models reveal that free cash flows have a higher level of persistence than the accrual component of earnings. However, in terms of persistence, the subcomponent of free cash flows that matters most is cash distributions to equity holders. This type of cash flow has the largest correlation coefficient (Pearson and Spearman) among all cash subcomponents and accounts for the largest percentage of the total variation of free cash flows.

To fully investigate and understand the phenomenon of the persistence of the cash component and subcomponents of earnings, we split our total sample of firm-year observations on the basis of positive and negative free cash flows and then calculate the proportion of the free cash flows used or provided by each component. On one hand, when the cash component of earnings is positive, firms can distribute these earnings to equity holders or debtholders or retain them by increasing the cash balance. On the other hand, when firms have negative free cash flows, they must finance them by either debt or equity issuances or by reducing their cash balances.

Fig. 1 shows that the majority of firms that have a cash deficit choose to finance it by issuing equity (83%), and only 22% of firms choose to finance their negative cash flow by incurring more debt. Furthermore, the average firm, when faced with a cash shortfall, does not reduce the cash balance.

Fig. 2 shows the way in which the sample firms choose to distribute their cash surpluses: 48% pay cash dividends or stock repurchases, 25% repay their debt obligations and the remaining 27% increase their cash balances through retained earnings. Thus, cash dividends and stock repurchases are the most common use of positive free cash flows.

Comparing firms with cash deficits and firms with cash surpluses shows that the main source and use of funds consists of cash flows attributed to equity holders. This finding is consistent with our initial findings from the regression models that cash flows to equity holders are the most persistent element of the free cash flows of the average firm.

3.3. Stock returns tests results

In this section, we examine how investors price the persistence of the cash component and cash subcomponents of current earnings. The results from the five regression models applied from the combination of each decomposition of earnings against one-year-ahead raw returns and abnormal returns are reported in Tables 4 and 5, respectively. Furthermore, the analysis is again performed on actual values (Part A) and on decile ranks (Part B).

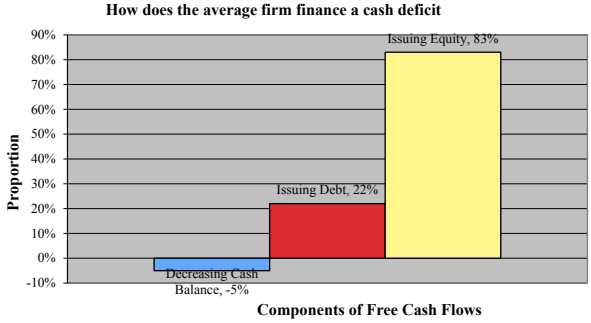

Fig. 1. Sources to Finance a Cash Deficit (12,654 firm-year observations).

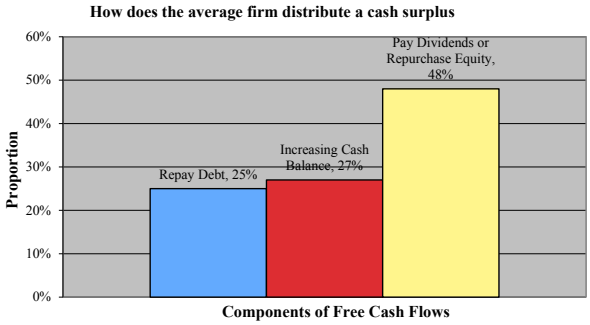

Fig. 2. Choices to Distribute a Cash Surplus (12,077 firm-year observations).

Model 1 examines whether stock prices act as if investors anticipate the implications of free cash flows for future profitability. As expected, we obtain a positive and highly statistically significant result for free cash flows. In the case of raw returns based on actual values, the coefficient of free cash flows is 0.193, and in the case of abnormal returns, it is 0.195. Thus, investors significantly undervalue the implications of the cash component of earnings when forming earnings expectations. The results based on decile ranks (Part B of Tables 4 and 5) are quite similar and further corroborate our initial findings.

Models 2, 3 and 4 report the regression results for each cash subcomponent of earnings in isolation. The coefficient of cash and short-term investments (Model 2) is statistically insignificant in all cases – both for the analysis performed on actual values and for the analysis performed on decile ranks – whereas the coefficients of cash distributions to debt and equity holders are always statistically significant and positive (Model 3 and 4). Our results indicate that market participants, when making their investment choices, systematically undervalue the importance of cash distributions to debt and equity holders. Our findings contrast with those of Dechow et al. (2008), who show that investors in the U.S. correctly anticipate the persistence of cash distributions to debt and equity holders. Thus, as previously noted, empirical regularities attributable to the cash component of earnings in the U.S. are not applicable to the U.K.; moreover, this finding might result from the different institutional settings in the two countries.

Finally, Model 5 reports the results from the regression that simultaneously includes all cash subcomponents of earnings. The coefficient of cash and short-term investments is insignificant for the analysis performed on either actual values or decile ranks. Further, the coefficient of cash distributed to equity holders and debtholders proves to be statistically significant for both those models involving raw returns and those with abnormal returns. At this point, it should be noted that among the cash subcomponents of earnings, cash to debtholders exhibits the largest coefficient in terms of magnitude. Thus, investors generally assign a lower weight than is warranted to the cash component of earnings that is distributed to capital providers in pricing the implications for future earnings performance, with the undervaluation of cash distributions to debtholders being more severe than that of cash distributions to equity providers. Thus, summarizing the results from the stock return regression analysis, we find support for the naïve investor hypothesis.

The final part of our analysis involves portfolio tests that examine the economic significance of future stock returns associated with the cash component and cash subcomponents of earnings. Specifically, we calculate the raw returns of hedge trading strategies based on the magnitude of free cash flows, cash and short-term investments, and cash distributed to debt and equity holders. Notably, the results from portfolio tests remain qualitatively similar when we consider instead abnormal returns (i.e., size and book-to-market adjusted returns).[10]

Fama and French (2008) were wary that small and micro-cap stocks might exert undue influence in this context and thus stressed the importance of examining the pervasiveness of any effect on stock returns attributable to accounting figures across different size groupings. Without size partitions, there is a possibility that portfolio results are unduly influenced by micro-cap stocks. Micro cap stocks tend to be illiquid, subject to high trading costs and characterized by market-microstructure problems. Such a possibility casts doubt on the feasibility of attaining trading returns involving micro-cap stocks. Indeed, Fama and French (2008) provide evidence that return predictability attributable to the asset growth rate is driven by micro-cap and small cap stocks.

In light of these concerns, we follow Fama and French (2008) and conduct our portfolio analysis separately for micro, small and large size groupings. In particular, for each year at the end of June, we assign stocks to size groups. Micro cap stocks (Micro) are those below the 20th percentile of the London Stock Exchange, small cap stocks (Small) are those between the 20th and 50th percentiles, and large cap stocks (Large) are those above the 50th percentile. Having determined the market cap cut-offs for size groupings at the portfolio formation date, firms are then sorted independently based on the cash components of earnings and are distributed into five equal-sized portfolios (quintiles) based on these ranks. The hedge portfolio consists of a long (short) position in the highest (lowest) portfolio.

[10] Results are available upon request.

Table 4
Cross-sectional regressions of future raw returns on cash components of earnings.

Part A: Regressions of one-year-ahead raw returns on the cash component of earnings and cash subcomponents of earnings, conditional on current earnings performance (based on actual values)

Model 1: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 FCF_t + \upsilon_{t+1}$
Model 2: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \upsilon_{t+1}$
Model 3: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_D_t + \upsilon_{t+1}$
Model 4: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_E_t + \upsilon_{t+1}$
Model 5: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \gamma_3 DIST\_D_t + \gamma_4 DIST\_E_t + \upsilon_{t+1}$

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	**0.1717**	**0.1690**	**0.1689**	**0.1745**	**0.1770**
	3.604	***3.325***	***3.428***	***3.451***	***3.631***
NI	**−0.438**	−0.316	−0.305	**−0.409**	**−0.397**
	−2.520	*−1.762*	*−1.698*	***−2.295***	***−2.472***
FCF	**0.193**				
	4.111				
ΔCASH		−0.054			0.086
		−0.672			*1.091*
DIST_D			**0.271**		**0.278**
			3.772		***3.816***
DIST_E				**0.166**	**0.189**
				3.444	***3.557***
Adj R^2	0.03	0.02	0.02	0.03	0.03
SER	0.561	0.562	0.563	0.561	0.560
Skewness	3.342	3.297	3.307	3.327	3.314
Kurtosis	45.052	44.479	44.851	44.995	44.571
LM	0.017	0.020	0.020	0.018	0.018

Part B: Regressions of one-year-ahead raw returns on the cash component of earnings and cash subcomponents of earnings, conditional on current earnings performance (based on decile ranks)

Model 1: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 FCF_t^{dec} + \upsilon_{t+1}$
Model 2: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 \Delta CASH_t^{dec} + \upsilon_{t+1}$
Model 3: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 DIST\_D_t^{dec} + \upsilon_{t+1}$
Model 4: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 DIST\_E_t^{dec} + \upsilon_{t+1}$
Model 5: $RET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 \Delta CASH_t^{dec} + \gamma_3 DIST\_D_t^{dec} + \gamma_4 DIST\_E_t^{dec} + \upsilon_{t+1}$

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.1168	**0.1696**	0.1010	0.1319	0.0715
	1.748	***2.711***	*1.664*	*1.975*	*1.119*
NI	−0.073	−0.018	−0.018	−0.050	−0.047
	−1.948	*−0.385*	*−0.399*	*−1.300*	*−1.327*
FCF	**0.139**				
	4.611				
ΔCASH		−0.022			0.002
		−0.985			*0.103*
DIST_D			**0.114**		**0.111**
			5.608		***5.470***
DIST_E				**0.086**	**0.088**
				2.758	***2.933***
Adj R^2	0.02	0.02	0.02	0.02	0.03
SER	0.563	0.565	0.565	0.564	0.563
Skewness	3.386	3.336	3.341	3.375	3.358
Kurtosis	46.103	45.670	45.683	46.018	45.678
LM	0.018	0.021	0.021	0.019	0.020

Table 4 reports time-series means and t-statistics (*in italics*) from Fama and MacBeth's (1973) annual cross-sectional regressions of one-year-ahead raw returns on the current cash component and cash subcomponents of earnings, conditional on the level of current earnings performance. The sample consists of 24,731 annual firm-year observations, covering all firms listed on the London Stock Exchange (except financial firms) with sufficient data to compute financial statement variables and returns using Worldscope and Datastream files over the 1981–2013 period. All variables are defined in Table 1. Bold numbers indicate significance at less than the 5% level (2 tailed t-test). LM is the serial correlation diagnostic test, and SER is the standard error. Part A provides results based on the actual level of independent variables, whereas Part B provides results based on decile rankings of independent variables.

Part A of Table 6 reports the average raw returns of portfolios and the associated t-statistics, based on the magnitude of free cash flows. The "Market" row pools all stocks, whereas the remaining rows pool stocks from different size groupings. When all sample stocks are pooled, a monotonic relationship across free cash flow quintiles appears to emerge; as we move from the low to the high free cash flow portfolios, raw returns increase in magnitude from a low value of 9.2% to a high value of 19.3%, resulting in the hedge portfolio exhibiting a positive and statistically significant raw return of 10.1%. Other rows show that the above-mentioned portfolio results are primarily driven by Micro and Small stocks, which are numerous but constitute only a small fraction of total market capitalization. The average raw return to the Micro hedge portfolio is 10.5%, whereas the return to the Small hedge portfolio is 9%. Simultaneously, Large stocks earn an average hedge return of approximately 6.3%. Large

Table 5
Cross-sectional regressions of future abnormal returns on cash components of earnings.

Part A: Regressions of one-year-ahead abnormal returns on the cash component of earnings and cash subcomponents of earnings, conditional on current earnings performance (based on actual values)

Model 1: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 FCF_t + \upsilon_{t+1}$
Model 2: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \upsilon_{t+1}$
Model 3: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_D_t + \upsilon_{t+1}$
Model 4: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 DIST\_E_t + \upsilon_{t+1}$
Model 5: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t + \gamma_2 \Delta CASH_t + \gamma_3 DIST\_D_t + \gamma_4 DIST\_E_t + \upsilon_{t+1}$

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	**0.0304**	**0.0283**	**0.0285**	**0.0334**	**0.0364**
	3.976	***3.291***	***3.693***	***3.995***	***4.817***
NI	**−0.436**	**−0.313**	**−0.302**	**−0.412**	**−0.396**
	−3.900	***−2.650***	***−2.606***	***−3.643***	***−3.836***
FCF	**0.195**				
	4.723				
ΔCASH		−0.068			0.068
		−0.925			*0.951*
DIST_D			**0.275**		**0.285**
			3.707		***3.772***
DIST_E				**0.169**	**0.185**
				4.359	***4.380***
Adj R^2	0.02	0.01	0.01	0.02	0.02
SER	0.548	0.550	0.549	0.548	0.547
Skewness	3.308	3.265	3.275	3.297	3.284
Kurtosis	45.140	44.513	44.891	45.096	44.695
LM	0.015	0.017	0.017	0.015	0.015

Part B: Regressions of one-year-ahead abnormal returns on the cash component of earnings and cash subcomponents of earnings, conditional on current earnings performance (based on decile ranks)

Model 1: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 FCF_t^{dec} + \upsilon_{t+1}$
Model 2: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 \Delta CASH_t^{dec} + \upsilon_{t+1}$
Model 3: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 DIST\_D_t^{dec} + \upsilon_{t+1}$
Model 4: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 DIST\_E_t^{dec} + \upsilon_{t+1}$
Model 5: $ARET_{t+1} = \gamma_0 + \gamma_1 NI_t^{dec} + \gamma_2 \Delta CASH_t^{dec} + \gamma_3 DIST\_D_t^{dec} + \gamma_4 DIST\_E_t^{dec} + \upsilon_{t+1}$

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−0.0039	**0.0532**	−0.0180	0.0130	−0.0395
	−0.188	***3.030***	*−1.064*	*0.609*	*−2.007*
NI	**−0.124**	−0.060	−0.063	**−0.095**	**−0.088**
	−4.781	*−1.939*	*−2.027*	***−3.794***	***−3.716***
FCF	**0.146**				
	5.586				
ΔCASH		−0.032			−0.011
		−1.477			*−0.572*
DIST_D			**0.111**		**0.109**
			5.709		***5.574***
DIST_E				**0.083**	**0.082**
				3.238	***3.466***
Adj R^2	0.02	0.01	0.01	0.01	0.02
SER	0.549	0.551	0.550	0.550	0.549
Skewness	3.341	3.293	3.297	3.327	3.311
Kurtosis	46.094	45.619	45.615	45.958	45.645
LM	0.015	0.017	0.017	0.016	0.017

Table 5 reports time-series means and t-statistics (*in italics*) from Fama and MacBeth's (1973) annual cross-sectional regressions of one-year-ahead abnormal returns on the current cash component and cash subcomponents of earnings, conditional on the level of current earnings performance. The sample consists of 24,731 annual firm-year observations, covering all firms listed on the London Stock Exchange (except financial firms) with sufficient data to compute financial statement variables and returns using Worldscope and Datastream files over the 1981–2013 period. All variables are defined in Table 1. Bold numbers indicate significance at less than the 5% level (2 tailed t-test). LM is the serial correlation diagnostic test, and SER is the standard error. Part A provides results based on the actual level of independent variables, whereas Part B provides results based on decile rankings of independent variables.

stocks constitute a large fraction of the total market capitalization, do not suffer from thin trading and short positions on them would be genuinely attainable.

The picture is quite similar when we examine the raw returns of the quintile and hedge portfolios formed on the magnitude of cash distributions to debtholders (Table 6, Part C) and to equity holders (Table 6, Part D). The hedge portfolio on cash distributions to debtholders generates a raw return of approximately 10.1%, whereas the hedge portfolio on cash distributions to equity holders generates a raw return of approximately 7.4%. In comparison with Large stocks, Micro and Small stocks are responsible to a larger degree for the hedge returns earned from cash distributions to debtholders. The raw return

Table 6
Raw returns of portfolios based on cash components of earnings.

	Portfolios					
	Low	2	3	4	High	Hedge (H-L)
Part A: Raw Returns of Portfolios Based on FCF						
Market	0.092	**0.123**	**0.162**	**0.177**	**0.193**	**0.101**
	1.513	***2.554***	***3.497***	***3.898***	***4.284***	***3.016***
Micro	0.039	0.079	0.091	**0.156**	**0.144**	**0.105**
	0.424	*1.138*	*1.722*	***2.169***	***2.46***	***2.555***
Small	0.088	0.082	**0.155**	**0.157**	**0.178**	**0.09**
	1.261	*1.712*	***2.912***	***2.958***	***3.506***	***2.108***
Large	**0.155**	**0.157**	**0.174**	**0.189**	**0.218**	**0.063**
	2.888	***3.494***	***4.201***	***4.527***	***5.268***	***2.178***
Part B: Raw Returns of Portfolios Based on ΔCASH						
Market	**0.161**	**0.147**	**0.158**	**0.152**	**0.13**	−0.031
	3.017	***3.082***	***3.272***	***3.346***	***2.503***	*−1.361*
Micro	0.195	0.056	0.11	0.081	0.073	−0.122
	1.997	*1.089*	*1.64*	*1.41*	*1.092*	*−1.688*
Small	**0.129**	**0.147**	**0.158**	**0.11**	0.114	−0.015
	2.194	***2.894***	***3.141***	***2.097***	*1.863*	*−0.485*
Large	**0.185**	**0.168**	**0.176**	**0.194**	**0.171**	−0.014
	4.219	***3.751***	***4.135***	***4.522***	***3.645***	*−0.837*
Part C: Raw Returns of Portfolios Based on DIST_D						
Market	0.083	**0.146**	**0.159**	**0.176**	**0.184**	**0.101**
	1.838	***2.934***	***3.466***	***3.528***	***3.497***	***5.356***
Micro	−0.001	0.06	**0.149**	0.149	0.153	**0.154**
	−0.01	*1.055*	***2.37***	*1.937*	*1.91*	***2.893***
Small	0.05	**0.133**	**0.175**	**0.134**	**0.164**	**0.114**
	1.085	***2.216***	***2.832***	***2.897***	***3.084***	***4.913***
Large	**0.139**	**0.162**	**0.18**	**0.21**	**0.201**	**0.062**
	3.378	***3.75***	***4.322***	***4.589***	***4.325***	***4.185***
Part D: Raw Returns of Portfolios Based on DIST_E						
Market	0.095	**0.156**	**0.165**	**0.162**	**0.169**	**0.074**
	1.56	***3.107***	***3.476***	***3.847***	***3.698***	***2.168***
Micro	−0.029	0.166	**0.138**	0.136	0.095	**0.124**
	−0.48	*1.827*	***2.131***	*1.86*	*1.698*	***3.24***
Small	0.06	**0.139**	**0.176**	**0.155**	**0.129**	**0.069**
	0.912	***2.452***	***3.172***	***3.235***	***2.672***	***2.659***
Large	**0.153**	**0.184**	**0.182**	**0.181**	**0.194**	0.041
	2.763	***4.263***	***4.267***	***4.62***	***4.6***	*1.258*

Table 6 reports time-series means and t-statistics (*in italics*) of one-year-ahead raw returns for portfolios formed on the magnitude of the current cash component and cash subcomponents of earnings. For each year, firms are sorted independently based on cash components of earnings and are distributed into five equal-sized portfolios (quintiles) based on these ranks. The hedge portfolio consists of a long (short) position in the highest (lowest) portfolio. The sample consists of 24,731 annual firm-year observations, covering all firms listed on the London Stock Exchange (except financial firms) with sufficient data to compute financial statement variables and returns using Worldscope and Datastream files over the 1981–2013 period. All variables are defined in Table 1. Bold numbers indicate significance at less than the 5% level (2 tailed t-test). We report results for all stocks (Market) and across different size groupings. In so doing, we assign stocks to size groups at the portfolio formation date. Micro cap stocks (Micro) are those below the 20th percentile of the London Stock Exchange market cap at the end of June, small cap stocks (Small) are those between the 20th and 50th percentiles, and large cap stocks (Large) are those above the 50th percentile.

of the hedge portfolio on cash distributions to equity holders for Micro and Small stocks is 12.4% and 6.9%, respectively, but for Large stocks, the return is insignificant.

In contrast with cash distributions to debtholders and equity holders, changes in cash and short-term investments produce negative and statistically insignificant raw hedge returns, suggesting that retained cash flows do not impact future returns. Overall, our findings suggest that the positive relationship between free cash flows and stock returns can be solely attributed to cash distributions to firm stakeholders.

Finally, we extend our analysis by examining whether the economic significance of future stock returns associated with the cash component and cash subcomponents of earnings persists over time in the U.K. stock market. The tests on the persistence of this phenomenon are conducted using major events that have affected the U.K. financial reporting environment, namely, the introduction of FRS 3 in 1992 and the mandatory adoption of the IFRS in 2005. Further, we investigate the return performance of portfolios formed based on the magnitude of free cash flows and cash flow subcomponents during the recent global financial crisis. Thus, we divide our sample period into four subperiods – from 1981 to 1992 (pre-FRS 3), from 1993 to 2004 (post-FRS 3–pre-IFRS), from 2005 to 2013 (post-IFRS) and from 2007 to 2013 (Financial Crisis) – and report the results in Table 7.

In all four subperiods, our initial findings are further validated. Specifically, zero-investment portfolios based on free cash flows exhibit positive raw returns, which in most cases are statistically significant. The hedge portfolios on retained cash flows have statistically insignificant negative raw returns during three of the four subperiods under investigation. The hedge return

Table 7
Raw returns of portfolios based on cash components of earnings within different subperiods.

	Portfolios					
	Low	2	3	4	High	Hedge (H-L)
Part A: Raw Returns of Portfolios Based on FCF						
1981–1992	0.15	**0.21**	**0.222**	**0.241**	**0.263**	**0.113**
	1.704	***2.43***	***2.648***	***2.754***	***3.272***	***3.664***
1993–2004	0.123	0.099	**0.154**	**0.155**	**0.163**	0.04
	1.108	*1.678*	***3.148***	***3.771***	***3.278***	*0.544*
2005–2013	−0.058	0.015	0.073	0.106	0.124	**0.182**
	−0.48	*0.135*	*0.586*	*0.89*	*1.032*	***4.294***
2007–2013	−0.036	0.01	0.079	0.117	0.124	**0.16**
	−0.23	*0.073*	*0.546*	*0.852*	*0.9*	***3.341***
Part B: Raw Returns of Portfolios Based on ΔCASH						
1981–1992	**0.207**	**0.232**	**0.231**	**0.207**	**0.209**	0.002
	2.645	***2.601***	***2.475***	***2.502***	***2.437***	*0.063*
1993–2004	0.18	**0.133**	**0.16**	**0.168**	0.133	−0.047
	2.089	***2.793***	***3.387***	***3.237***	*1.915*	*−1.211*
2005–2013	0.071	0.057	0.066	0.065	−0.001	−0.072
	0.59	*0.476*	*0.548*	*0.56*	*−0.004*	*−2.221*
2007–2013	0.091	0.072	0.069	0.057	0.004	**−0.087**
	0.64	*0.519*	*0.512*	*0.438*	*0.026*	***−2.931***
Part C: Raw Returns of Portfolios Based on DIST_D						
1981–1992	0.145	**0.219**	**0.208**	**0.233**	**0.281**	**0.136**
	1.699	***2.287***	***2.796***	***3.063***	***2.862***	***3.801***
1993–2004	0.086	**0.135**	**0.171**	0.167	**0.135**	**0.049**
	1.679	***2.57***	***2.554***	*2.134*	***2.794***	***2.76***
2005–2013	−0.028	0.042	0.052	0.092	0.102	**0.13**
	−0.27	*0.353*	*0.474*	*0.742*	*0.734*	***3.273***
2007–2013	−0.026	0.036	0.067	0.096	0.119	**0.145**
	−0.2	*0.277*	*0.486*	*0.669*	*0.713*	***2.966***
Part D: Raw Returns of Portfolios Based on DIST_E						
1981–1992	0.163	**0.226**	**0.242**	**0.214**	**0.241**	**0.078**
	1.823	***2.672***	***2.657***	***2.795***	***2.789***	***3.623***
1993–2004	0.118	**0.174**	**0.156**	**0.17**	**0.157**	0.039
	1.211	***2.616***	***3.192***	***3.661***	***3.531***	*0.512*
2005–2013	−0.058	0.034	0.092	0.101	0.092	**0.15**
	−0.459	0.288	0.761	0.867	0.784	**3.209**
2007–2013	−0.05	0.033	0.096	0.095	0.118	**0.168**
	−0.294	*0.238*	*0.734*	*0.745*	*0.854*	***2.951***

Table 7 reports time-series means and t-statistics (*in italics*) of one-year-ahead raw returns for portfolios formed on the magnitude of the current cash component and cash subcomponents of earnings, within different subperiods. For each year, firms are sorted independently based on the cash components of earnings and are distributed into five equal-sized portfolios (quintiles) based on these ranks. The hedge portfolio consists of a long (short) position in the highest (lowest) portfolio. The sample consists of 24,731 annual firm-year observations, covering all firms listed on the London Stock Exchange (except financial firms) with sufficient data to compute financial statement variables and returns using Worldscope and Datastream files over the 1981–2013 period. All variables are defined in Table 1. Bold numbers indicate significance at less than the 5% level (2 tailed t-test). We report results within the following subperiods: the subperiod before the introduction of FRS 3 (i.e., 1981–1992), the subperiod after the introduction of FRS 3 and before the mandatory adoption of the IFRS (i.e., 1993–2004), the subperiod after the mandatory adoption of the IFRS (i.e., 2005–2013) and the subperiod that covers the recent global financial crisis (i.e., 2007–2013).

on changes in the cash balance is statistically significant only during the recent financial crisis. Finally, the raw returns of the zero-investment portfolios based on cash distributions to debtholders and equity holders are positive and statistically significant in the vast majority of cases.

The most interesting finding from the subperiod analysis is that in the post-IFRS subperiod – and particularly within the recent global financial crisis – hedge portfolios exhibit the largest raw returns, whereas the smallest returns are found in the post-FRS 3–pre-IFRS subperiod. Specifically, during the recent crisis, the cash component of earnings of the hedge portfolio exhibits a 16.0% raw return, compared with a 4.0% return in the post-FRS 3–pre-IFRS subperiod. The cash distributions to the debtholder portfolio has a 14.5% return during the subperiod that covers the crisis, compared with a 4.9% return in the post-FRS 3–pre-IFRS subperiod. The cash distributions to the equity holder portfolio exhibits a 16.8% raw return during the crisis, compared with a 3.9% return in the post-FRS 3–pre-IFRS subperiod. Overall, the results are consistent across the different subperiods and clearly suggest that the mispricing of the cash component of earnings persists over time in the U.K., even after controlling for major changes affecting the institutional and economic environments.

4. Conclusions

The objective of the present paper was to thoroughly examine the persistence, pricing and economic significance of the cash component of earnings. In so doing, we focused on a free cash flow measure that excludes all accruals associated with

investing or operating activities. This analysis was performed on U.K. listed companies from 1981 to 2013, and the decomposition of the cash component of earnings consisted of three distinct categories of cash flows: a) changes in the cash balance and short-term investments; b) cash distributed to debtholders; and c) cash distributed to equity holders.

The results from the persistence tests indicate that there are systematic differences in the persistence among the cash subcomponents of earnings and that the cash component of earnings cannot be treated as a homogeneous unit. First, although all three cash subcomponents represent an economically significant variation of the free cash flows, the cash flows attributable to equity holders have the highest persistence, which is in line with previous findings for the U.S. market (Dechow et al., 2008) because the extent to which managers in the U.S. and U.K. influence some actions of their firms, such as payout policy, is quite similar (Crossland & Hambrick, 2011). Second, in contrast to previous research from the U.S., we find that cash retained by the firm exhibits a different level of persistence than accruals. This finding can be attributed to differences in the respective reporting systems and managerial practices involving earnings between the U.S. and the U.K. Third, our evidence indicate that cash distributed to debt holders has a level of persistence almost identical to that of accruals. This finding is consistent with the low signalling nature (with respect to future earnings performance) of issuances/distributions to debtholders.

Furthermore, we evaluated investors' understanding of the differential persistence of the three cash subcomponents of earnings in the U.K. stock market. In contrary to findings for the U.S. listed firms, we show that investors do not misprice the implications of retained cash flows for future earnings performance. At the same time, we show that investors undervalue the importance of the cash component of earnings, and this underestimation can be attributed solely to cash distributions to stakeholders. The latter finding contrasts the current evidence for the U.S. stock market documented by Dechow et al. (2008), who show that investors correctly assess the implications of debt and equity issuances/distributions for future profitability. These results are likely to arise from the two countries' different institutional settings.

Hedge trading strategies based on cash distributions to either debt or equity holders can produce positive raw and abnormal returns in the future. Although our results are consistent across various subsamples (based on changes in the financial reporting and economic environment, and based on different size groups), we show that the largest returns were earned in the post-IFRS subperiod and from micro stocks.

Our results are of substantial value to investment analysts and professionals who use discounted free cash flow valuations to estimate the intrinsic or true value of a company. Under this approach, the definition of free cash flows typically adds back the change in the cash balance. This definition implicitly assumes that cash holdings are paid out to financiers and that retained cash flows are thus a source of free cash flows. However, our results indicate that when companies are running cash surpluses, 27% of the free cash flows are retained in the form of increased cash balances.

Finally, our findings raise an issue for asset pricing. We find that cash distributions to equity holders are the most persistent cash subcomponent of earnings and that hedge portfolios based on this cash subcomponent produce positive raw and abnormal future returns. Thus, it is important to examine whether the quality of cash distributions to equity holders is relevant for asset pricing and whether it is a priced risk factor in the cross section of stock returns.

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