Earnings Quality in U.K. Private Firms

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First version: 7 March 2001
This version: 16 May 2002

Acknowledgments

We thank Sudipta Basu, Martin Casey, Greg Clinch, Gilad Livne, Jerold Zimmerman, an anonymous referee and seminar participants at Massachusetts Institute of Technology and London Business School for helpful comments.

Abstract

We study a large sample of U.K. private and public company earnings reports. The predominance of private companies makes their financial reporting practices interesting in their own right, but a feature of the UK institutional setting makes them especially interesting: private and public companies face the same regulations on auditing, accounting standards and tax laws. We hypothesize that private-company financial reporting nevertheless is lower in quality because that is what the market demands. Using time-series measures, we demonstrate that earnings quality (measured as timely loss incorporation) indeed is lower in private companies, despite them facing the same regulations. This result is not affected by size and industry differences, and holds for firms with Big-5 auditors. The result assists in understanding the economic role of accounting standards, an issue that is surprisingly neglected in the literature.

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We examine the quality of private company earnings, utilizing observable measures of quality and a unique dataset of more than 100,000 private U.K. firms. Private company earnings are interesting in their own right, due to the predominance of private companies in the economy. The U.K. setting is particularly interesting, because U.K. private company financial reporting is subject to substantially equivalent regulatory provisions as public company reporting, whereas the markets for private and public financial reporting are substantially different. We argue that the market demands lower quality financial reporting for private companies than for public companies, regulation notwithstanding, and report evidence consistent with that view.

Three principal features of the U.K. financial reporting regulations are substantially equivalent for private and public companies. First, the U.K. Companies Act requires all private and public companies to file annual financial statements that comply with the same accounting standards. Second, financial statements filed by U.K. private companies must be audited (there is an exemption for very small companies, but no firms in our sample qualify). Third, private and public companies are subject to the same tax laws. These are the major regulatory institutions for U.K. financial reporting, and they are substantially equivalent for public and private companies.

Nevertheless, the market for financial reporting differs substantially between private and public companies. Private companies are more likely to resolve information asymmetry by an "insider access" model. They are less likely to use public financial statements in contracting with lenders, managers and other parties, and in equity transactions. Their financial reporting is correspondingly more likely to be influenced by taxation and dividend policies. These differences imply a demand for lower quality financial reporting, where we define "quality" in abstract terms as the usefulness of the financial statements for contracting, monitoring, valuation and other decision making by investors, creditors, managers and all other parties contracting with the firm.

More specifically, we predict that earnings quality is lower in private companies than in public companies, due to the different economic function of financial reporting in the two groups.

"Earnings quality" is an abstract concept, and we measure a single but nevertheless important attribute of it – timeliness in financial-statement recognition of economic losses. We argue that timely loss recognition increases the economic efficiency of financial statement use, particularly in corporate governance and loan agreements. Governance is affected because timely loss recognition makes managers less likely to undertake investments they know *ex ante* to be negative-NPV, and less likely to continue operating *ex post* negative cash-flow investments. Financing is affected because timely loss recognition provides more accurate *ex ante* information for loan pricing, and makes debt covenants based on *ex post* accounting ratios (such as leverage, investment and dividend restrictions) more quickly effective. We therefore argue that timely financial-statement recognition of economic losses is an important attribute of earnings quality.

We measure timeliness of loss recognition from the time-series behavior of private and public firms' earnings. Basu's (1997) measure of association between accounting income and negative stock returns (a proxy for economic losses) by definition does not exist for unlisted companies, so we adopt his alternative time-series measure. This measures the extent of negative transitory components in accounting income, relying on the transitory nature of economic income. While potentially noisy, this time-series measure has been shown to correlate highly with returns-based measures by Basu (1997), Ball and Robin (1999) and Ball, Robin and Wu (2000a). For a potentially less noisy measure, we also examine the time-series relation between accruals and cash flow from operations, and obtain consistent results. We control for differences in size and industry composition between private and public companies in several ways.

In a large U.K. sample, both measures of earnings quality are substantially lower in private companies than in public companies, controlling for size and industry composition, and

despite them facing identical accounting and tax rules. The results support the arguments in Ball, Kothari and Robin (2000) and Ball, Robin and Wu (2000a,b), that market demand substantially determines the financial statements that companies actually issue.

Our findings should not be interpreted as suggesting the need for stricter regulation of financial reporting by private firms, or that the lower earnings quality of private firms is in any way sub-optimal. Quite the contrary: we believe (and adopt as a maintained hypothesis) that the observed lower quality of earnings for private firms is optimal, and arises endogenously in the market for financial reporting. In other words, the lower earnings quality we observe in private firms reflects a legitimate difference in demand for financial reporting, not a failure in supply.

The following section develops the hypothesis that earnings quality is affected by the different economic roles of financial reporting in private and public companies. Section three develops the rationale for examining transitory negative earnings components as a measure of earnings quality. Section four describes the relevant UK institutional details and our UK data. Section five describes our tests and results, and section six presents our conclusions.

2. Hypothesis: Different Demand for Financial Statements in Private and Public Companies

By many measures, private companies have greater economic significance than public companies.[1] Furthermore, private and public companies differ in important ways. Private companies have different ownership, governance, management and compensation structures, they do not have access to public capital markets, their financial statements are not widely distributed to the public, and are more likely to be influenced by income tax objectives.

[1] Over 90% of registered U.K. companies are private (Companies House, U.K.). They constitute 99.9% of all private non-agricultural entities in 1993 Europe (Mulhern 1995). The Forbes list of the top 500 U.S. private companies (http://www.forbes.com/private500/) includes 245 with revenues exceeding $1 billion in 2000. The U.S. Small Business Administration (http://www.sba.gov/advo/stats/facts99.pdf) reports that in 1998 businesses with fewer than 500 employees accounted for 51% of US GDP, 47% of sales, and 53% of private nonfarm employment. The role of small firms in job creation, growth and innovation is widely debated: see Schumpeter (1934) and Acz (1996).

In spite of their economic importance and likely differences from public companies, little is known about financial reporting by private firms. We attribute this to the difficulty of obtaining their financial data, and to the absence of market-based measures of quality, such as association with stock prices or returns. We address these limitations with a unique sample of U.K. private-firm data, using time-series-based measures of earnings quality that do not require market data. In this section, we outline the institutional framework for private and public company reporting in the U.K., and develop our hypothesis that their financial reporting fulfils different economic functions and hence differs in quality, even under identical accounting standards.

2.1 Regulatory Influences: U.K. Company Law for Private and Public Companies

In the United Kingdom, all limited liability companies are formed by incorporation with the Companies House, the government agency that administers them. They are registered as either public or private companies. Public companies must incorporate 'public limited company' or 'plc' in their name, whereas private limited liability companies need only include 'limited.'[2] Public companies must have a minimum share capital of £50,000 before they can commence business, whereas there is no minimum share capital requirement for private companies.[3]

The most important distinction between private and public companies relates to their ability to raise funds from the general public. A public company has an unrestricted right to offer shares or debentures to the public, whereas this is prohibited in the case of a private company.[4] In addition, existing shareholders in public companies have a preemptive first right of refusal on public stock offerings, but no such right exists in private companies.[5] Since only public companies can issue shares to the general public, only they are eligible to be listed. In our empirical analysis, we define "public companies" as those listed on the London Stock Exchange.

[2] Section 25 of Companies Act, 1985.
[3] Section 117 of Companies Act, 1985.
[4] Section 81 of Companies Act, 1985.

Prior to 1967, only public companies were required to file their financial statements with the Registrar of Companies House. In the preceding years there was a substantial increase in the number of firms incorporated as private companies, and also in the percentage of private companies being liquidated or struck-off the Companies Register, which sparked political fears of abuse and creditor protection. This led to the Companies Act of 1967 requiring all companies, private and public, to file their financial statements annually with the Registrar.

The 1981 Companies Act modified this provision, allowing "small" and "medium-sized" companies to protect their financial affairs from public scrutiny by reporting only abridged financial statements. Under the Act, "Small" companies have (i) sales ("turnover") not exceeding £2.8 million, (ii) book value of total assets not exceeding £1.4 million and (iii) average number of employees not exceeding 50 for the last two years. "Medium" companies have (i) annual sales revenue not exceeding £11.2 million, (ii) total assets (book value) not exceeding £5.6 million and (iii) an average number of employees not exceeding 250 for the last two years. Small companies are required to submit only an abbreviated balance sheet, and medium companies are required to submit an abbreviated profit and loss account (which need not disclose sales) as well.[6]

The financial statements of private (public) companies must be filed within ten (seven) months of their fiscal year. Failure to file is a criminal offense. All financial statements must be prepared in accordance with U.K. accounting standards, whether the firm is public or private.[7] They must be audited if annual sales exceed £350,000, a threshold exceeded by all firms in our sample.[8] U.K. tax laws likewise do not discriminate between public and private firms. In all

[5] Section 89 of Companies Act, 1985.
[6] Sections 246 and 246A of the Companies Act, 1985
[7] Sections 221-242 of Companies Act, 1985 lay down the rules for submission of accounts and audit reports.
[8] The threshold has been increased to £1 million after June 2000 (Section 249A of Companies Act).

important respects, the U.K. regulatory regimes for public companies and all but the smallest private companies are equivalent.[9]

2.2 Market Influences: The Demand for Earnings Quality in U.K. Private and Public Companies

The fundamental reason for earnings quality to differ between private and public companies is that their financial statements fulfill different economic roles. The median private company in our sample has long term debt less than 1% of total assets (more than 40% report none), which reduces the demand for high-quality financial reporting. Communication with creditors, employees, suppliers, customers and others more likely is on a private "as needed" basis. Private companies are more closely held and have greater managerial ownership, and shareholders take a more active role in management, thereby reducing agency costs and the demand for financial statements for monitoring managers.

Private communication would be comparatively inefficient for public companies, due to the large number of actual and potential shareholders and continual trading of their stock in the secondary market. For public firms in common-law countries like the U.K., information asymmetry therefore is ameliorated largely through public dissemination of information, so higher-quality financial statements are demanded than in private companies. The demand for higher quality public financial statements is reflected in the legal obligations of financial statement issuers –managers and auditors – who are more likely to recognize economic losses in a timely fashion, to reduce stockholder and creditor litigation. Managers and auditors of private firms do not face the same litigation costs, even in common-law countries.

The economics of private company financial reporting has an international parallel. It has a similar economic function to public company reporting in countries that resolve information

[9] The London Stock Exchange listing rules require additional disclosure for public companies, but do not mandate accounting standards for financial reporting and in particular do not address the calculation of earnings.

asymmetry via "insider access" rather than "arm's length" public disclosure. Examples of insider access include the German "stakeholder" system, with both labor and capital (bank) represented in corporate governance, the Japanese *keiretsu* and South Korean *chaebol* systems of investing and trading largely within internally-informed corporate groups, and the Chinese system of family-controlled businesses and *guanxi* (connections) networks. When information asymmetry is resolved more via insider access, the demand for high quality public financial reporting is reduced, and financial statements generally incorporate economic losses in a less timely fashion.[10] We expect private U.K. companies follow a similar pattern.

On the supply side of the financial reporting market, accounting standards are by no means the only factor of production. Ball, Kothari and Robin (2000) note that standards are less complex than the transactions encountered in practice (and hence judgment is needed to implement them), that they lag innovations in practice, and that managers and auditors do not always follow them. Timely loss recognition requires estimates of future cash inflows from assets or outflows for liabilities. For example, applying the "lower of cost or market" rule for inventory valuation requires judgment about "fair market value," because much inventory is not traded in liquid markets. Likewise, asset impairment charges against earnings (e.g., under FRS11 in the UK and FAS 121 in the US) are triggered by subjective expectations of reduced cash flows, an inherently subjective process that is likely to be affected by manager and auditor incentives, as well as political and tax considerations. Consequently, the demand side of the market can influence financial reporting practice in many ways other than via accounting standards.

2.3 Regulation of Accounting Standards, Market Demand and Earnings Quality

In summary, a unique feature of the U.K. institutional setting allows us to attribute differences in earnings quality between private and public companies to differences in the

[10] Ball, Kothari and Robin (2000), Ball, Robin and Wu (2000a,b).

economic role of financial reporting, and not to regulation. That is, the regulatory requirements for financial reporting by U.K. limited liability companies – both private and public – are substantially equivalent. This implies that quality differences are not due to regulation, but to differences in the demand for financial reporting between the groups. Watts and Zimmerman (1986) introduced the notion that the incentives of managers and auditors exert an important influence on financial reporting practice. We argue that there is a lower incentive of managers and auditors in private firms to recognize economic losses in a timely fashion, and we argue in addition that the incentive arises endogenously in the market for financial reporting.

3. Transitory Negative Earnings Components as a Measure of Earnings Quality[11]

Our principal measure exploits the transitory nature of economic income. Economic income is defined as change in market value of equity, adjusted for dividends and capital contributions, and incorporates changes in the present values of expected future cash flows. To a first approximation, economic income is independently distributed across time.[12] Accounting recognition of economic income occurs under two broad models. Timely recognition incorporates unrealized gains or losses in income (and hence the balance sheet) on a capitalized or "one time" basis, as asset impairment charges for example. This generates components of accounting income that are transitory: they do not repeat over time. Deferred recognition awaits the realization of the changed cash flows, so gains and losses are incorporated gradually over the life of the investment. This generates elements of accounting income that are "persistent:" they repeat over time. Other things equal, capitalization on a "one time" basis is the more timely recognition model.

We identify which model is most prevalently used to recognize economic losses, by measuring the extent of negative transitory income components. This section outlines the

[11] This section is based on Basu (1997), Ball, Kothari and Robin (2000), Ball, Robin and Wu (2000a) and Ball (2001)
[12] Samuelson (1965), Fama (1970). Hicks (1946) discusses alternative definitions of income.

rationale for that approach. It describes the economic role of timely loss recognition, the time-series model we use to estimate the extent of timely loss recognition, and properties of the model.

3.1 The Economic Demand for Timely Loss Recognition in Accounting

Managers possess private information about economic gains and losses. Some information is unobservable to lenders, suppliers, customers and other "external" parties, because it is obtained as a consequence of managers' "internal" access to it. Accountants typically are reluctant to base financial statements on managers' unobservable information, presumably because managers then would be unlikely to reveal it truthfully. Thus, under the fundamental "revenue recognition rules" of financial reporting, income is based on actual cash flow realizations, adjusted for accruals that are derived from independently-observable and accurate predictors of future cash flow realizations (such as accounts receivable from credit sales).

High-quality accounting departs from the basic revenue realization model by incorporating information about *declines* in expected ("unrealized") future cash flows, (i.e., economic losses).[13] A long-standing example of accounting asymmetrically "anticipating" unrealized losses (but not gains) is the "lower of cost or market" inventory rule, which incorporates unrealized economic losses in accounting income (Basu 1997). Asymmetry in accounting for long-term assets has become more pronounced in recent decades.[14] This asymmetry has been formalized in asset impairment standards issued by several countries, including FAS No. 121 and FAS No. 144 in the U.S., and FRS11 in the U.K. Upward revaluation has not been practiced in the U.S. since the SEC was established in 1934. In the U.K., revaluations can be recognized on the balance sheet, but are not included in net income. In contrast, asset impairments are charged directly against net income.

[13] Basu (1997), Ball, Kothari and Robin (2000), Ball, Robin and Wu (2000a,b).
[14] Hayn (1995), Elliott and Hanna (1996), Francis, Hanna and Vincent (1996), Basu (1997), Collins, Maydew and Weiss (1997), Ball, Kothari and Robin (2000).

The timeliness of economic loss incorporation is an important attribute of earnings quality because it makes financial statements more useful in several contexts, primarily in corporate governance and loan agreements. Consequently, it is more efficient to contract with managers and lenders on the basis of an earnings variable that has more timely loss incorporation.

A governance efficiency of timely loss incorporation is due to mitigating agency problems arising from managers' investments decisions. If managers know *ex ante* that losses will be recognized during their tenure, they are less likely to make investments they know to be negative-NPV. Untimely loss recognition – by deferring recognition until the reduced cash flows underlying the negative NPV are realized – is more likely to pass the earnings consequences on to subsequent generations of managers. Untimely loss recognition also provides managers with an accounting-based incentive to continue operating *ex post* negative cash-flow investments and strategies, in order to avoid booking losses on sale or abandonment. The agency problem is mitigated by timely recognition of economic losses, even in the absence of actual disposal, thereby increasing managers' incentives to act quickly to limit the economic losses. Timely loss recognition therefore increases the efficiency of contracting between firms and managers.[15]

Timely incorporation of economic losses also increases the efficiency of debt agreements. Timely loss recognition might assist *ex ante* loan pricing. It also makes restrictions in debt agreements on leverage, investment and dividends more *ex ante* efficient, by making them take affect more quickly *ex post*. Income-statement restrictions such as minimum interest coverage ratios obviously are directly affected by loss recognition practices in accounting. Balance-sheet restrictions also are affected, because accounting losses flow from the income statement onto the book values of the asset, liability and owners' equity accounts reported on the balance sheet.

[15] An example is reported in DaimlerBenz AG *Annual Report 1996* (English language version, pages 44-45), reproduced in Ball (1998). Daimler implemented US GAAP standards for calculating earnings throughout the

Consequently, timely income-statement incorporation of economic losses implies timely decreases in the book value of assets and/or increases in the book value of liabilities, which unequivocally increase balance sheet leverage. In turn, this more quickly transfers decision rights from managers to lenders, including rights to veto dividends, new borrowing, new investment and major transactions (these rights can be enforced, waived or create a basis for recontracting). Timely loss recognition therefore makes contracting between firms and lenders more efficient.

We do not focus on timely gain recognition, because there is less demand for it. The fundamental reason for this asymmetry is a deeper asymmetry in managers' incentives to reveal private information: they are more likely to reveal economic gains than losses. In debt contracts, there is less demand for accounting recognition of economic gains, because both managers and lenders know that managers have incentives to inform potential lenders about gains, to avoid loan over-pricing – and, if necessary, they can realize the gains. Further, debt agreements do not transfer decision rights when covenants are exceeded, so lenders do not demand timely gain recognition. In governance, the agency issues arise from managers undertaking or continuing negative-NPV investments, not positive. Consistent with these arguments, Basu (1997) shows that loss recognition has become the prime source of timeliness in annual earnings.

The issue of accounting quality arises because the financial statements can incorporate adverse information about future cash flows in a more or less timely fashion. Timely incorporation requires capitalizing the reduction in expected cash flows and incorporating it as a "one time" loss in accounting income. Accounting income then incorporates transitory negative components that in principle are observable in the time series of accounting income changes. In contrast, untimely incorporation occurs if the financial statements record cash flows only when

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corporation, reducing the discretion of individual business-unit managers over reporting their own performance (including their capacity to hide losses), and requiring them to focus more on shareholder value.

they are realized. Then, economic losses are incorporated in accounting income gradually over time, so they are not fully incorporated until the end of the affected investments' lives, and as a consequence accounting income does not contain transitory negative components.

3.2 Time-series Model of Timeliness in Loss Recognition

We initially measure timely loss incorporation in terms of the tendency for decreases in accounting income to reverse (Basu 1997), an indicator of transitory loss components in income. We allow the first-order serial dependence in earnings changes to be conditional on the sign of the prior earnings change, to separately identify transitory gain and transitory loss components. If prior-period decreases exhibit a lower tendency to reverse in private companies, then there is evidence of a lower frequency of capitalized, transitory loss components of private-company earnings, due to a lower demand for timely loss recognition.

To identify transitory gain and loss components in accounting income, we estimate various specifications of the piecewise linear regression:[16]

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \varepsilon_t \quad (1)$$

ΔNI_t is change in income (alternatively defined as including and excluding extra-ordinary and exceptional items) from fiscal year t-1 to t, scaled by beginning book value of total assets. $D\Delta NI_{t-1}$ is a dummy variable taking the value 1 if the prior-year change ΔNI_{t-1} is negative.

Untimely recognition of economic gains, by deferring incorporation in income until the increased cash flows that underlie the gains are realized, causes gains to show up as "persistent" positive components of accounting income. Thus, positive changes in income tend not to reverse, the prediction being $\alpha_2 = 0$. Timely recognition of economic losses implies they show up as "transitory" negative components of income. Thus, negative changes in income tend to reverse, when the transitory loss components pass and income reverts to prior levels, the prediction being

$\alpha_2 + \alpha_3 < 0$. The hypothesis that economic losses are more likely to be recognized in a timely fashion than gains is tested by the prediction that $\alpha_3 < 0$.

3.3 Model Properties

The independent variable in this piecewise linear specification is *change* in income, not its level. The changes specification has two primary advantages. First, it is the correct specification for identifying transitory elements in income.[17] Second, survival biases are less likely for firms with negative earnings changes than negative levels. Non-linearity is due to accounting income being a mixture of two processes: a type of moving average of current and past economic gains; and a substantially less smoothed, more transitory incorporation of economic losses.

3.4 Accruals-based Test of Loss Recognition

Negative earnings change likely is a noisy proxy for transitory economic loss components of earnings, limiting the power of Basu's serial dependence test to detect timely loss recognition. We therefore report an alternative test that exploits the likelihood that timely loss recognition occurs through accounting accruals. Under the "matching" rules of accounting, accruals eliminate much of the noise in periodic operating cash flow that is due to firms' working capital investment and financing decisions. For example, cash flow is affected by transitory changes in inventory levels (such as a short delivery at year-end); under accrual accounting these effects are eliminated from accounting income by matching the cost of inventory sold, not purchased, against sales revenue. Thus, cash flow is noisier than accounting income, working-capital accruals function to reduce the noise in cash flow, and accruals and changes in cash flow from operations are negatively correlated.[18] We model loss recognition rules as constituting an additional accounting process determining accruals and accounting income. Under this process, timely recognition of

[16] The signed variable here is earnings *change*, so the non-linearity modelled is different from that in Hayn (1995).
[17] Hayn's (1995) bankruptcy model predicts a non-linearity, but it applies to income *levels*.

economic losses is based on the expectation of reduced cash flows, and does not await their realization. By definition, it therefore is accomplished through accruals.

A greater propensity for timely recognition of losses, relative to gains, thus produces an asymmetry in the relation between accruals and cash flow from operations. Economic losses are more likely to be unrealized (i.e., non-cash) accrued charges against income, whereas economic gains are more likely to be realized and hence accounted for on a cash basis.[19] We therefore test for differences in this asymmetry between private and public companies, as evidence of different likelihoods of accruing economic losses.[20] This alternative measure has its own sources of noise, including variation across time and firms in the relation between cash flow and income (e.g., as a function of growth) and errors in calculating operating cash flow from changes in balance sheet accounts (Hribar and Collins 2002). Which measure is superior is an empirical issue.

4. Data

4.1 Sample Selection

The data are obtained from the March 2000 and earlier versions of the "Financial Analysis Made Easy"(FAME) database supplied by *Bureau Van Dijk.* The FAME database provides financial statement data on over 100,000 public and private British companies for the fiscal years ending between January 1989 and December 1999. It is compiled from records filed at the Companies House in Cardiff, London and Edinburgh, and supplemented with information taken from the London and Edinburgh Gazettes. Its coverage is less detailed in the initial years.

The database is updated monthly. When a firm converts from one type to another (private to public, for example), all its past information is classified in subsequent versions of FAME

[18] Dechow (1994) describes accruals as reducing matching problems. See also Guay, Kothari and Watts (1996).
[19] No such asymmetry would occur if accruals functioned only to manage earnings by reducing its variability. Accruals then would be negatively related to both negative and positive changes in cash flow from operations.
[20] We do not examine serial dependence in accrual changes *per se*, which would require a control for expected accrual changes conditional on current-period cash flows and on prior-period accruals.

under the latest firm type. We therefore checked the company type in older versions of the database for each year over the sample period, 1990 to 2000. Changes in company type were verified against the listing or delisting date from the London Share Price database and/or from the date of last change of name in the FAME database (conversions between private and public require a name change in the U.K.). The database does not include banks, insurance companies and other financial institutions. It includes only companies with either annual turnover greater than £750,000 or pre-tax profits greater than £45,000, or shareholders' funds greater than £750,000. Thus, very small companies are not represented, and there is a small survivor bias. There is no other survivor bias because coverage starts when a firm first files annual accounts with the Companies House and stops only when it stops functioning as a separate legal entity.

We exclude subsidiaries of other firms from our private company sample, since the economic role of their financial reporting likely is different. For example, Ford Motor Company Limited (U.K.) is a private, wholly owned subsidiary of Ford Motor Company (USA), a publicly quoted firm. The major investment and financing decisions concerning Ford Motor Company Ltd. (U.K.) likely are made by its parent, and thus the economic function of its financial statements is different than in an independent private company.[21] We also exclude all firm-years in which the fiscal year was not exactly twelve months. Further, we exclude firm-years with a change in organizational type (such as public to private), because these are non-random firms that are known to have systematic reporting biases (Teoh, Welch and Wong 1998).

Several forms of verification are used by the vendor to insure accuracy of the FAME data. In addition, we screen out observations judged likely to be erroneous, based on the following rules. First, we exclude firms for which book value of total assets changed by over 30% from the

[21] Comparison of private subsidiaries with listed firms yields results similar to those reported in the paper. This suggests that reporting by private subsidiaries is more like private non-subsidiaries than listed firms.

prior year. These are likely to be firm-years in which a major acquisition, restructuring or divestment occurred.[22] Second, we exclude firm-years in which accounting numbers were inconsistent (e.g., revenues, expenses and profits were inconsistent) or irreconcilable across the different monthly versions of FAME. After these exclusions, the sample consists of 315,077 firm-years for private companies and 8,257 firm-years for public listed companies.

Some non-stationarities induced by major transactions and by data errors most likely remain. Companies do not file with the Companies House electronically, so there undoubtedly are some typographical errors. Undetected errors in creating the dataset also are likely, especially in view of its size and limited circulation. These introduce error in measuring year-to-year changes in accounting income, our primary independent variable. To reduce estimation bias in regression slopes we study a truncated sample that excludes 1% of the accounting variables at each extreme.[23] Kothari, Sabino and Zach (1999) demonstrate that truncating skewed distributions such as earnings can substantially bias the test statistics, but we believe that there are sufficient errors (as distinct from genuinely extreme observations) in the data to warrant it. We repeat the analyses with 0.5% and 2% exclusion criteria, and our conclusions are unaltered.

4.2 Descriptive Statistics

Little is known about private companies generally and about the database used in this study, so we provide relatively detailed descriptive statistics. To maintain comparability with our results, we present descriptive statistics only for the data used in our tests.[24] This restriction essentially excludes very small firms that are required by the Companies Act to report only the balance sheet and not the profit and loss account. For ease of presentation, we categorize the

[22] This could exclude extreme gains or losses, so we re-ran the basic regressions (reported in Tables 3 to 5 below) on two alternative samples: (1) no exclusion based on change in total assets; and (2) excluding firms/years when total assets changed by less than 50% or more than 100%. Neither modification had a qualitative impact on the results.
[23] Errors are likely to be independent in time, and thus lead to over-estimating transitory components of income.
[24] Summary statistics for the full sample can be obtained from: www.london.edu/faculty/lshivakumar.

variables into income statement (Table 1) and balance sheet items (Table 2). Panels A and B present statistics for public and private companies respectively, with t-statistics for a two tailed test of differences in means between private and public. The t-statistics must be interpreted with caution, since they control for neither cross-sectional nor serial correlation.[25]

4.2.1 Income statement items

Table 1 presents descriptive statistics for the income statement variables. Size is the most obvious difference. Listed firms in the sample have mean annual sales of £433 million, compared to £6 million for private firms. Other measures of firm size (such as total assets and number of employees) exhibit typical right skewness for both private and public firms, indicating the presence of a few relatively large firms in both groups. The substantial size difference between private and public firms suggests the need to control for size in our earnings quality analyses.

Table 1

Net income (either before or after exceptional and extra-ordinary items), scaled by total assets, averages approximately 5% for publicly listed firms and 6% for private firms.[26] This is consistent with private firms being more profitable, or more capital-constrained. It also could reflect greater accounting conservatism of listed firms, as noted below. The median accrual (scaled by book value of assets) is –3.4% and –3.2% for public and private firms, most likely due to depreciation, which is an unambiguously negative accrual. Average cash flow from operations, scaled by book value of total assets, is 12.2% and 10.7% for public and private firms.[27] Cost of sales as a fraction of sales is similar across the groups. Asset turnover and the ratio of depreciation and amortization to long-term assets on average are higher for private firms.

[25] Descriptive statistics are for all firm-years with data availability, which varies across firm-years and data items.
[26] For variables that are scaled by beginning of year total assets, we repeated the analyses using either sales or end of year total assets. The results are qualitatively unchanged.
[27] Cash from operations data are taken from the cash flow statements, which are reported by only a sub-sample of firms, while accruals data are backed out of balance sheet figures and consequently include more observations.

Our first evidence on earnings quality differences between public and private companies is the statistics for exceptional and extra-ordinary items.[28] Under U.K. accounting standards, both exceptional and extra-ordinary items relate to material events or transactions that are unusual and non-recurring in nature. Exceptional items arise within the firm's ordinary business activities, whereas extra-ordinary items arise outside its ordinary activities (Financial Reporting Standard 3). Public firms report significantly negative average exceptional and extra-ordinary items combined (-0.5% of total assets), compared with 0.0% for private firms. Public firms report either an exceptional or extra-ordinary item in 58% of all firm/years, with negative values in 36% of all firm/years. Private firms report exceptional or extra-ordinary items in only 14% of firm/years, with negative values in 7% of firm/years. These data are consistent with listed companies being more likely to recognize economic losses in a timely manner, as negative transitory ("one time") components of income.[29] This is despite public companies on average being substantially larger and having less volatile earnings before exceptional and extra-ordinary items.

The earnings skewness statistics contain further evidence of accounting differences between public and private firms. Income is positively skewed for private firms, but negatively skewed for public firms, consistent with them recording a greater frequency of large losses. The skewness statistics for income before both exceptional and extra-ordinary items are –1.0 and +1.7 for private and public firms, respectively. The equivalent skewness statistics for income after both exceptional and extra-ordinary items are –1.2 and +2.3. The substantial difference in skewness between the private and public firms, even for income *before* exceptional and extra-ordinary items, occurs despite them exhibiting near-identical skewness for Sales (+4.1 and +4.0) and Cost of Sales/Sales (-1.0 and –1.1), and despite private firms exhibiting substantially greater earnings

[28] Exceptional items (and income before exceptional and extraordinary items) are on the FAME database after 1994.
[29] We report below that most of the asymmetry is in earnings *before* exceptional and/or extra-ordinary items.

volatility.[30] The difference in skewness of net income occurs despite the samples exhibiting similar skewness in accruals, suggesting it is due to a different relation between cash flow and accruals. We take up this suggestion in table 5 below. Overall, the negative earnings skewness for public firms is consistent with them recognizing economic losses as large transitory items, but not booking economic gains symmetrically. Private firms do not exhibit this earnings left-skewness.

4.2.2 Balance Sheet items

Table 2 presents the summary statistics for balance sheet items. Substantial size differences between private and public companies are apparent, as in the income-statement variables. The average public company has total assets of £484.3 million, while the average private firm has total assets of only £4.1 million. The first decile of total assets for public (private) firms is £10.6 million (£0.3) and the ninth decile is £1179.5 million (£9.2). This is further evidence of the need to control for size in our analysis of differential earnings quality.

Table 2

Intangible assets constitute less than 1% of total assets on average, for both private and public firms. This could be due to UK accounting standards, which historically allowed acquired goodwill to be written off against shareholders' equity. Private firms report a lower average ratio of interest to long-term debt, consistent with their lower average long-term leverage (over 40% have no long-term debt). Including current liabilities, their average leverage ratio is higher.

5. Results: Timely Loss recognition in Private and Public Companies

The descriptive statistics provide preliminary evidence that listed public companies recognize more large loss components in book income than private firms. Net income (before and after exceptional and extra-ordinary items) is negatively skewed for public firms, but

[30] The standard deviation of income *before* exceptional and extra-ordinary items (scaled by opening book value of total assets) is 9.4 for private companies and 6.9 for public companies.

positively skewed for private firms. Exceptional and extra-ordinary items are more frequently negative for public firms. This section investigates whether they are more likely to report loss components of book income that are transitory in time, and whether their accrual behavior is consistent with transitory loss recognition.

5.1 Differential Mean Reversion in Earnings Changes

Table 3 presents the results from estimating the following version of the regression (1), modified to allow differences between private and public firms:

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_4 DPR + \alpha_5 DPR * D\Delta NI_{t-1} + \alpha_6 * DPR * \Delta NI_{t-1} + \alpha_7 DPR * D\Delta NI_{t-1} * \Delta NI_{t-1} + \varepsilon_t \quad (2)$$

where DPR is a dummy variable that takes the value 1 for private firms and 0 for publicly-listed firms, and other variables are as defined above. Asymmetry in the accounting recognition of economic losses and gains in public firms implies the coefficient α_3 is negative, implying that earnings decreases are less smoothed/persistent and more transitory than increases, and indicating a more timely recognition of economic losses than gains. The hypothesis that private firms are less likely to recognize economic losses in a timely fashion than public firms implies the coefficient α_7 is positive, indicating an incrementally lower tendency for private firms to incorporate losses as transitory items.

Table 3

Panel A of Table 3 reports results for three definitions of income: income before both exceptional and extra-ordinary items; income after exceptional items, but before extra-ordinary items; and income after both exceptional and extra-ordinary items. This allows us to examine the role of exceptional items and extra-ordinary items in timely loss recognition.[31] Prior to 1994, the

[31]In their commentary on Ball, Kothari and Robin (2000), Pope and Walker (1999) argue that international differences in the accounting standards that define these items are important in cross-country comparisons. That is

FAME database has limited data on income before exceptional and extra-ordinary items and on exceptional items, so the regressions for those variables have considerably lower sample sizes.

For public companies, there is clear evidence of transitory loss but not gain components, under all income definitions. The coefficient α_2 on lagged positive earnings changes is small and insignificant, ranging from 0.02 to 0.04 depending on the income definition. The near absence of serial dependence, conditional on an income increase, is consistent with deferred incorporation of economic gains in income over time (increases are persistent). In contrast, the incremental coefficient α_3 on lagged negative earnings changes is significantly negative, ranging from –0.62 to –0.74, and.[32] This indicates a substantial reversal of negative income changes, consistent with timely recognition of economic losses as non-repeating transitory components of income. The α_3 coefficient estimates are only slightly larger in absolute value for earnings defined after exceptional and/or extra-ordinary items, suggesting that some transitory loss components are classified by U.K. public companies as exceptional or extra-ordinary, but most are not.

For private companies, the results are substantially different. As hypothesized, private companies are less likely to incorporate transitory losses in income. The incremental private-firm coefficient α_7 on income decreases is significantly positive for all income definitions (t-values of 5.22, 11.30 and 11.56). Furthermore, private companies are more likely to incorporate transitory *gains*, since the incremental private-firm coefficient α_6 on earnings increases is significantly negative for all income definitions (t-values of –3.81, -6.71 and –6.79). That is, decreases in private-company income are substantially less transitory, but *increases* are substantially more

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not an issue in our data, because the U.K. accounting standards for public and private companies are the same. Nevertheless, we study exceptional and extra-ordinary items because of our hypothesis, adapted from Ball, Kothari and Robin (2000), that accounting standards alone do not determine the practices of financial statement issuers.

[32] Ball and Robin (1999) report a coefficient of –0.98 for U.K. listed firms over the period 1986-96.

transitory. Overall, these results are consistent with our hypothesis that private companies report lower-quality earnings, in the form of less timely recognition of economic losses.

Figures 1 and 2

Figure 1 graphs the serial dependence coefficients for income changes in private and public firms, with income defined before and after both exceptional and extra-ordinary items. It shows that negative earnings changes are substantially less transitory for private companies, and positive changes are more transitory. Figure 2 compares the U.K. public and private samples with the most comparable common law and code law public-firm group results in Ball and Robin (1999, Table 3) and East Asia public-firm group results in Ball, Robin and Wu (2000a, Table 4).[33] U.K. private firms most closely approximate the code law group, which is not surprising in view of the "insider access" model of ameliorating information asymmetry in code-law countries.

5.2 Tests for Robustness

Pope and Walker (1999) claim that UK accounting standards cause income before exceptional and/or extra-ordinary items to incorporate substantially fewer negative transitory elements than income after these items. There is little evidence of this in our private company sample, which reports under UK standards. The estimated slope of earnings changes on negative lagged earnings changes is the sum of the incremental coefficients, $\alpha_2 + \alpha_3 + \alpha_6 + \alpha_7$. In table 3, this is approximately –0.4 independent of whether income is measured before or after exceptional and/or extra-ordinary items, inconsistent with the claim.[34] The corresponding estimate for public firms ($\alpha_2 + \alpha_3$) is –0.7 for income after exceptional and/or extra-ordinary items, but only –0.6 for income before these items. Private and public firms therefore differ slightly in reporting exceptional and extra-ordinary items, even though they report under the same UK standards.

[33] For comparability, U.K. results are for income after exceptional and extra-ordinary items (Pope and Walker 1999).
[34] The skewness statistics for private firms are similar for all three income definitions (1.7, 2.4 and 2.3).

The sample of firm/years underlying Panel A of Table 3 varies across alternative definitions of net income, primarily due to the absence of data on exceptional and/or extra-ordinary items in the earlier years of the FAME database. Panel B of Table 3 reports results from a sample that is constant across all income definitions. No coefficient changes substantially in sign or magnitude, and our conclusions are unchanged.

The significantly positive value of α_7 could be due to the size difference between public and private firms. Larger firms – both public and private – could report economic losses in a more timely manner than small firms, due for example to greater litigation risk, agency problems, or use of long term debt finance. To check this possibility we included size, defined as logarithm of end of year total assets, as an additional interactive variable, similar to DPR in regression equation (2). Results are reported in Panel A of Table 4. Controlling for size adds little explanatory power: adjusted r-squares increase by only 0.3% - 0.5%. The coefficient on $SIZE*D\Delta NI_{t-1}*\Delta NI_{t-1}$ is significantly positive, consistent with larger firms being more likely to report transitory losses. Nevertheless, the coefficient in which we are primarily interested, namely the α_7 slope on $DPR*D\Delta NI_{t-1}*\Delta NI_{t-1}$, is qualitatively unaffected by the control for size and continues to be significantly positive. Size differences do not appear to explain differences between public and private companies in gain and loss recognition practices.

In untabulated results, we included leverage (defined as the ratio of long-term debt to shareholder's funds) as an additional interactive variable in the size-controlled regression. Our purpose was to control for potential differences between public and private companies in the amount (as distinct from the private versus public nature) of debt financing, and associated volatility effects. The results were qualitatively unchanged.

Table 4

To test whether differences in industry composition between public and private firms can explain our results, we re-estimated equation (2) with 349 interactive dummy variables for each 3-digit SIC code. Results from this regression are reported in Panel B of Table 4. The interactive dummies reduce the degrees of freedom, but little other change is apparent. Further, the results remain qualitatively unaltered when size is included as an additional interactive variable.

5.3 Differential Accruals Behavior

Accruals and changes in cash flow from operations generally are negatively correlated (Dechow, 1994), but the relation is unlikely to be linear due to asymmetric recognition of unrealized economic losses (which by definition are non-cash, and hence are accrued) relative to unrealized economic gains. These negative transitory accruals are more likely in periods of negative changes in operating cash flow. We therefore test for a difference between private and public companies in the degree of asymmetry between accruals and cash flow changes. Table 5 presents results from regressing accruals on change in cash from operations:

$$ACC_t = \beta_0 + \beta_1 * D\Delta CFO_t + \beta_2 * \Delta CFO_t + \beta_3 * D\Delta CFO_t * \Delta CFO_t + \beta_4\, DPR + \beta_5 * DPR * D\Delta CFO_t + \beta_6 * DPR * \Delta CFO_t + \beta_7\, DPR * D\Delta CFO_t * \Delta CFO_t + \nu_t \quad (3)$$

where ACC_t is accruals in period t and is defined as:

ACC_t = ΔInventory + ΔDebtors + ΔOther current assets - ΔCreditors - ΔOther current liabilities – Depreciation (4)

Cash flow from operations (CFO_t) is measured as the difference between earnings before exceptional and extra-ordinary items and accruals.[35] $D\Delta CFO_t$ is a dummy variable that takes the value 1 if ΔCFO_t is negative, and 0 otherwise. As before, DPR is a dummy variable that takes the value 1 for private firms and 0 for listed firms. For public firms, the slope of accruals against

[35] In the absence of details from cash flow statements, we exclude exceptional and extra-ordinary items, which tend to be accrued on the balance sheet under "contingent liabilities" or as permanent diminution in value of fixed assets.

positive cash flow changes (β_2) is predicted to be negative. Asymmetric transitory gain and loss recognition predicts the incremental coefficient β_3 for negative cash flow changes is positive. Our central hypothesis, that private firms are less likely to recognize losses as transitory items, predicts that their asymmetry is lower. We test this by predicting β_7 is negative.

Table 5

The predictions are borne out in the results reported in Table 5. For listed firms, β_2 is significantly negative, consistent with the normal role of accruals in reducing the noise in cash flows. Moreover, β_3 is significantly positive, consistent with the negative relation between accruals and cash flow being less pronounced when ΔCFO_t is negative (that is, with more accrued, unrealized loss recognition than gain recognition, via accruals). For private firms, β_6 is positive, though not significant. The most important result is that β_7 is negative and statistically significant ($t = -3.77$), indicating that private companies recognize less accrued, unrealized losses as a function of reduced cash flows. These inferences remain unchanged, although the significance weakens, when size and/or industry dummies are included as interactive control variables. Overall, the accruals results support the notion that public firms report more unrealized losses than private firms, in large part through the accounting accrual process.

5.4 Private and Public Firm Samples Matched on Size, Industry and Fiscal Year-end.

Private firms are much smaller on average than listed firms, and could have different investment and financing policies. While we report above that the results are qualitatively unaffected by including size and industry dummies as interactive control variables, the effects of size and industry on the estimated coefficients need not be linear. Consequently, we also study a sub-sample of private and listed firms matched on the basis of size, industry and fiscal year-end.

In each year and for each private firm, we choose, without replacement, a size-matched firm from all listed firms with the same 2-digit SIC code and fiscal year-end.[36] The size-matched firm chosen is the closest in year-end total assets to the private firm, provided they differ by no more than 5%.[37] The above procedure yields 5020 pairs of matched firms, although the actual number of pairs for a particular analysis is lower depending on data availability. The average total assets for both the private firms and their matched public firms is £25mn. Size-matching creates a non-random sample that, as is apparent from the size deciles in Table 2, is selected largely from the largest decile of private firms and the smallest three deciles of listed firms.

Table 6

Table 6 repeats the Table 3 Panel A regression of change in earnings on lagged change in earnings, for the matched sample. The α_3 coefficient on $D\Delta NI_{t-1}*\Delta NI_{t-1}$ (for listed firms) remains significantly negative, consistent with a transitory loss component in the time-series of listed firms' earnings, but is lower in magnitude, particularly for income defined before exceptional and extra-ordinary items. This implies that transitory loss components are relatively less important in the earnings of the lowest size decile of listed firms. Consistent with the full sample results in Table 3, the coefficient α_7 on $DPR*\Delta NI_{t-1}*D\Delta NI_{t-1}$ is significantly positive. These results are consistent with substantially less transitory loss recognition in the size and industry matched private firms, and the recognition difference occurring largely through extra-ordinary items.

Table 7

Table 7 presents the matched-sample results from the regression of accruals on change in cash from operations. The results for the matched firms are qualitatively similar to those reported earlier. In particular, the β_7 coefficient on $DPR*D\Delta CFO_t*\Delta CFO_t$ is significantly negative,

[36] We match on 2-digit SIC codes because narrower classifications yield insufficient observations for meaningful analysis. We also conducted the analyses with replacement, with no qualitative impact on the results.

confirming our earlier results that differences in timely reporting of economic losses exist even across similar-sized public and private firms in the same industry.

5.5 Do public firms recognize losses in a more timely fashion, or are they merely more risky?

Watts and Zimmerman (1983) argue that because firms can self-select their organizational type for efficient risk sharing, listed firms might be higher risk and thus might experience a higher frequency and magnitude of economic losses. Even under the alternative hypothesis of equal accounting behavior, they then would report more and larger transitory losses. An alternative interpretation of our results thus is that listed firms simply face greater economic risk. We believe there are several reasons to reject this interpretation, as explained below.

First, the descriptive data reported in Table 1 imply that the listed-firm sample is not inherently more risky. Operating cash flows (standardized by total assets) are *less* variable for public firms than for private firms. The standard deviations are 9.3% and 10.8% respectively. The lowest decile of cash flow for public firms is +1.1%, but for private firms it is -2%, implying both lower volatility and a lower frequency of economic losses for listed firms. Thus, the descriptive data are consistent with selection of firm type occurring in the opposite direction (e.g., with high-risk firms not meeting the LSE's listing requirements).

Second, in our tests of different loss recognition between public and private firms, we focus on regression slope coefficients. In contrast to the co-variances of the dependent and independent variables, regression slopes are standardized by the variance of the independent variable, so the dummy slopes control for differences in variance of income changes between public and private firms.

Third, the alternative interpretation is inconstant with our results on the differential relation between cash flows and accruals for private firms. If both private and public firms report

[37] The results are qualitatively insensitive to changing the maximum difference in total assets to either 10% or 20%.

losses in the same manner, then the relationship between accruals and cash flows would not differ between the samples, independent of any risk differences. Accruals reflect reporting choices and cash flows reflect more fundamental economic gains and losses; in absence of reporting differences, the relationship between them would not differ between the samples. The regressions of accruals on changes in cash flows imply that they do differ.

Table 8

5.6 "Big-Five" Audit Firms and Earnings Quality

DeAngelo (1981) proposes that audit firm size is a determinant of audit quality. Basu, Hwang and Jan (2001) show that earnings reported by U.S. clients of larger audit firms incorporate economic losses in a more timely fashion. Chaney, Jeter and Shivakumar (2001), studying the FAME database we use, report that approximately three-quarters of U.K. public firms employ "Big five" auditors, compared with only one-quarter of private firms. These studies suggest that the differences in earnings quality we observe could be due to public firms being more likely to employ large auditors. This is not a threat to our hypothesis, because the selection of audit firm size is endogenous (it could be a means of bonding to or signaling high quality). Nevertheless, we investigate the relation between audit firm size and timely loss recognition.

Panel A of Table 8 confirms that the Big-five audit 76% of our public firms, but only 17% of the private firms. Panels B and C repeat the whole-sample analyses in Tables 3, 4 and 5, for firms with Big-five auditors. The results are similar. The important coefficient is α_7, measuring the relative propensity for private and public firms' income decreases to reverse. For the Big-five sample, α_7 varies between 0.39 and 0.40 for the three definitions of income, similar to 0.34 - 0.48 for the full sample in Table 3. Controlling for size, the coefficients are similar to the full sample in Table 4. If anything, Big-five audit clients are slightly *less* likely to report transitory exceptional items. The β_7 coefficients from the accruals regressions in Panel C are essentially

unchanged from the full sample in Table 5. Thus, even if audit firm size is viewed as an exogenous determinant of financial reporting quality, it is unlikely to explain the difference we observe between private and public firms.

Table 9

5.7 Fama-Macbeth t-statistics

In the pooled regressions reported above, the effect of cross-sectional correlation on the estimated standard errors is a concern, particularly since the data are concentrated in a small number of years. Panel A of Table 9 reports the number of observations each year for the regressions reported in Tables 3 and 5 above, and shows the potential for a small number of years to be influential in the pooled data. Panel B therefore reports Fama-Macbeth t-statistics derived from annual cross-sectional regressions, for all years that have non-trivial sample sizes, and for both listed and private firms. These t-statistics are not affected by cross-correlation in the residuals. Nor are they affected by skewness (or other departures from normality) in the residuals, since they are based on the sampling distribution of the mean of the annual regression slopes.

The Fama-Macbeth t-statistic for the incremental private-firm coefficient on earnings decreases [α_7 in regression (2)] is significantly positive for all three income definitions (t-values of 2.26, 6.81 and 5.36). This is due to a surprising degree of consistency in the annual coefficient values, which are positive in almost all years, for all definitions of income. The incremental public-firm loss recognition effect is robust with respect to this test.

The incremental private-firm accruals asymmetry [β_7 in regression (3)] is not significant, the coefficient having the predicted negative sign in only two of the five years. Operating cash flow here is estimated from changes in balance sheet accounts. Hribar and Collins (2002) show this is a noisy estimate, so we reran the regression using data taken directly from the cash flow statements, with accruals estimated as differences between operating profits and cash from

operations.[38] These data are available for only a sub-sample of firms beginning in 1994. The last two columns of Panel A in Table 9 show that the sample size is substantially reduced and is restricted mainly to 1996-1999. Despite the short sample period, Panel B of Table 9 shows that β_7 is consistently negative in the annual regressions, with a significant Fama-Macbeth t-statistic of -2.43. Overall, the Fama-Macbeth tests support our prediction that, compared to public listed firms, private firms are less likely to report economic losses in a timely manner.

Table 10

5.8 Are Managers of Public Firms More Opportunistic?

Our evidence that the earnings of public firms incorporate more negative transitory components than private firms also could be due to public-firm managers taking more frequent "big baths" in earnings, allowing them to report higher earnings in future years. Transitory negative earnings decreases thus could reflect managerial opportunism, not timely loss recognition. Basu's (1997) returns-based test is largely free of this ambiguity, because it requires timely loss recognition to be correlated with stock price decreases, but the time-series-based test we use is not. In the absence of prices for private firms, we offer the following differentiating test. If negative transitory earnings components arise from earnings management, then they are purely cosmetic and will not predict future cash flows. However, if the negative transitory components contain economic information about future cash flows, then both positive and negative earnings changes will be related to future cash flow from operations.

We test these differential predictions, by estimating the following regression:

$$CFO_{t+1} = \alpha_0 + \alpha_1 NI_{t-1} + \alpha_2 I_{\Delta NI<0} + \alpha_3 I_{\Delta NI>=0}*\Delta NI_t + \alpha_4 I_{\Delta NI<0}*\Delta NI_t + \alpha_5 DPR + \alpha_6 DPR*NI_{t-1}$$
$$+ \alpha_7 DPR*I_{\Delta NI<0} + \alpha_8 DPR* I_{\Delta NI>=0}*\Delta NI_t + \alpha_9 DPR* I_{\Delta NI<0}*\Delta NI_t + \varepsilon_t \qquad (5)$$

[38] Since FRS 1 (revised 1996), UK firms are required to reconcile operating profits to cash from operations before interest and taxes in their cash flow statement. US cash flow statements reconcile to income after interest and taxes.

where: CFO_{t+1} is cash flow from operations in year t+1 as reported in the cash flow statement, standardized by total assets at end of year t; NI_{t-1} is income (before or after) exceptional and extra-ordinary items, standardized by total assets at the end of year t-2; ΔNI_t is the change in income from year t-1 to t, standardized by total assets at end of year t-1; and $I_{\Delta NI<0}$ ($I_{\Delta NI>=0}$) is an indicator variable for negative (non-negative) earnings changes in year t. We expect α_3 and α_4 in the above regression to be positive, if both positive and negative earnings changes contain economic information. On the other hand, if negative earnings changes are due to earnings management, we expect insignificant values for α_3 and α_4. Moreover, if the information contained in earnings changes is the same for both public and private firms, then the incremental coefficients α_8 and α_9 will be insignificant. A negative value for these coefficients would suggest that earnings reported by public firms actually contain more economic information relating to one-year-ahead cash flows than the earnings reported by private firms, inconsistent with greater earnings management in these firms.

Results from regression (5) are reported in Table 10. Consistent with past earnings containing information to predict future cash flows, we find a significant α_1 coefficient for net income in year t-1. Also, the coefficients α_3 and α_4 are significantly positive, suggesting that both negative and positive earnings changes in year t contain information. The coefficient on negative earnings changes is significantly lower than that on positive earnings changes in year t, consistent with losses being incorporated in income as larger, more transitory components than gains. The incremental coefficients for private firms are negative, although significant only for positive earnings changes. These results hold irrespective of whether income is before or after exceptional and extra-ordinary items. There is no evidence in these regressions to suggest that transitory negative earnings changes in public firms are due to greater earnings management.

We repeated the above analysis with separate regressions for each year. The untabulated average coefficients from these annual regressions, and their Fama-Macbeth t-statistics, confirm the evidence. We also repeated the analyses using cash flows calculated from changes in balance sheet accounts. The results are qualitatively unchanged.

6. Conclusions

We study a sample of more than 100,000 U.K. private and public company earnings reports. The predominance of private companies in the economy makes their financial reporting practices interesting in their own right, but a feature of the UK institutional setting makes them especially interesting: under U.K. law, their financial statements must be audited and must comply with the same accounting standards and tax laws as public companies. We hypothesize that private-company financial reporting nevertheless is lower in quality because that is what the market demands. Using time-series measures of quality, we demonstrate that private-company earnings are lower quality, despite being prepared under the same rules. This result is not affected by controlling for size and industry differences between the samples, and holds in a sub-sample of firms with Big-5 audit firms.

These results support the arguments in Ball, Kothari and Robin (2000) and Ball, Robin and Wu (2000a,b), that financial statements are economic goods and their properties – including earnings quality – are determined primarily by the economic uses to which they are put. Lower earnings quality on average in private firms does not imply the failure of accounting or auditing standards, or the need for stricter regulation of financial reporting by private firms, or that their financial reporting practices are sub-optimal. Our interpretation is that the observed lower earnings quality in private firms is an equilibrium outcome in the market for corporate financial reporting, reflecting differences in demand for financial reporting between private and public firms, and is not a failure in supply.

The results also assist in understanding the economic role of accounting standards, an issue that is surprisingly neglected in the literature. Earnings quality is measurably lower in U.K. private companies than in public companies, even though their financial statements are audited and certified as complying with the same accounting standards. Accounting standards are not absolute givens, and their effectiveness is subject to market demand. Although the focus of this paper has been on private and listed companies in general, future studies could extend this line of research by examining firms that switch organizational type. Such studies could also address issues on the relative importance of changes in market demand for accounts and managerial reporting biases in explaining earnings patterns around switching events.

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Table 1
Summary statistics for income statement items

	Sales (£ mn)	Sales/ asset (%)	CoS/ Sales (%)	Depn/ l.t.asset (%)	Interest/ EBIT (%)	X-cep/ asset (%)	X-ord/ asset (%)	(X-cep +X-ord)/ asset (%)	NI_1 / asset (%)	NI_2/ asset (%)	NI_3/ asset (%)	Acc/ assets (%)	CFO/ assets (%)
A: Public listed firms													
	6661	4852	4168	6380	6093	3874	4980	3874	3874	5017	5016	4685	2451
Mean	433.4	140.3	68.8	12.5	0.2	-0.4	-0.1	-0.5	5.6	4.9	4.7	-3.8	12.2
% > 0	100.0	100.0	100.0	100.0	90.9	21.4	4.2	22.6	87.7	85.0	84.2	28.1	92.2
% < 0	0.0	0.0	0.0	0.0	0.0	22.9	21.3	35.9	12.3	14.9	15.7	71.9	7.8
Skewness	4.1	0.8	-1.0	1.7	3.8	-3.6	-5.5	-3.6	-1.0	-1.2	-1.2	-0.1	0.0
Std dev	1022.8	78.8	17.1	9.7	0.3	2.4	0.5	2.6	6.9	7.5	7.6	8.4	9.3
1st decile	10.2	40.0	45.4	2.2	0.0	-1.7	-0.3	-2.2	-1.5	-3.5	-3.9	-13.9	1.1
Median	74.6	136.1	72.2	10.9	0.1	0.0	0.0	0.0	6.0	5.5	5.3	-3.4	12.0
9th decile	1189.7	234.2	87.8	24.3	0.6	0.7	0.0	0.7	13.1	12.9	12.8	5.4	23.9
B: Private firms													
No. of obs	153819	110330	117065	154557	153426	96687	126583	96687	96687	128388	128341	115785	30357
Mean	6.0	203.8	68.5	18.5	0.3	0.1	0.0	0.0	5.9	5.9	5.9	-4.1	10.7
% > 0	100.0	100.0	100.0	100.0	72.3	6.5	0.8	7.5	82.2	80.9	80.7	34.5	86.2
% < 0	0.0	0.0	0.0	0.0	0.0	4.3	2.7	7.0	17.0	17.7	17.9	65.0	13.8
Skewness	4.0	1.4	-1.1	1.8	3.5	4.7	-10.4	2.8	1.7	2.4	2.3	-0.4	0.4
Std dev	10.8	160.3	20.4	17.0	0.4	0.8	0.1	1.0	9.4	10.3	10.2	13.4	10.8
1st decile	0.2	18.4	39.0	2.3	0.0	0.0	0.0	0.0	-2.4	-2.7	-2.8	-19.8	-2.0
Median	2.1	176.8	72.8	13.8	0.1	0.0	0.0	0.0	4.3	4.2	4.1	-3.2	9.9
9th decile	15.3	404.4	90.5	39.1	0.8	0.0	0.0	0.0	15.9	16.0	16.0	10.5	24.6
t-stat*	9.4	414.0	819.6	421.6	235.3	21.0	-29.0	11.7	196.4	209.2	208.2	-106.0	158.5

* t-stat for two tailed test of differences between private and public firms

Table 1 (contd.)

Variable definitions:

Sales	Total annual sales revenue in £ millions
Sales/asset	Sales divided by total assets at beginning of year
CoS/sales	Cost of sales divided by total sales.
Depn/l.t.asset	Depreciation and amortization expense divided by long-term assets (i.e., fixed assets + intangible assets) at end of year
Interest/EBIT	Interest expense, net of interest income, divided by earnings before interest and taxes
X-cep/asset	Exceptional items divided by total assets at beginning of year
X-ord/asset	Extra-ordinary items divided by total assets at beginning of year
(X-cep + X-ord)/assets	Exceptional items plus extra-ordinary items divided by total assets at beginning of year
NI_1/assets	Net income before exceptional and extra-ordinary items divided by total assets at beginning of year
NI_2/assets	Net income after exceptional but before extra-ordinary items divided by total assets at beginning of year
NI_3/assets	Net income after exceptional and extra-ordinary items divided by total assets at beginning of year
Acc/assets	Accruals scaled by beginning total assets, where accruals are change in inventory + change in debtors + change in other current assets – change in creditors – change in other current liabilities – depreciation
CFO/assets	Cash flow from operations (as per cash flow statement), scaled by beginning total assets

The table reports the summary statistics on income statement and cash flow variables for firm-years with data available to estimate regressions reported in either Tables 3 or 5. The statistics are reported separately for public listed firms and private firms. For each variable, the extreme 1% of the observations on each side is excluded.

Table 2
Summary statistics for balance sheet items

	Total assets (£ mn)	Interest/ Debt (%)	Lev_1 (%)	Lev_2 (%)	Intang/ asset (%)	Tang/ asset (%)	Reval/ l.t. asset (%)	No. of emp
A: Public listed firms								
No. of obs	6904	6961	6885	6955	6890	6852	5308	6780
Mean	484.3	3.4	49.0	10.3	0.8	39.1	5.4	4802.4
% > 0	100.0	91.3	100.0	80.3	17.2	100.0	37.8	100.0
% < 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skewness	4.8	0.8	0.4	1.5	6.1	0.6	2.8	4.1
Std dev	1294.4	2.6	18.6	11.8	3.5	23.8	11.1	11297.4
1st decile	10.6	0.1	25.6	0.0	0.0	10.3	0.0	100.0
Median	65.5	3.1	48.5	6.7	0.0	34.9	0.0	891.5
9th decile	1179.5	7.0	71.8	26.3	1.0	78.0	19.9	12195.5
	175779	177648	175110	176899	174324	177544	138526	123237
Mean	4.1	2.7	57.9	8.3	0.4	32.5	4.0	88.1
% > 0	100.0	72.0	100.0	56.7	9.2	94.8	14.6	100.0
% < 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skewness	4.9	1.0	0.3	2.4	7.0	0.7	3.6	3.8
Std dev	7.7	2.8	29.2	14.0	2.1	26.7	12.4	137.7
1st decile	0.3	0.0	18.1	0.0	0.0	2.0	0.0	5.0
5th decile	1.7	1.9	58.9	0.9	0.0	26.5	0.0	44.0
9th decile	9.2	6.9	92.6	26.5	0.0	74.2	13.1	206.0
	5.1	377.2	737.7	242.3	74.3	465.1	116.2	10.6

* t-stat for two tailed test of differences between private and public firms

Table 2 (contd).

Variable definitions:

Total assets	Total assets at end of year in £ millions
Interest/debt	Interest expense, net of interest income, divided by total liabilities
Lev_1	Leverage defined as total liabilities divided by total assets at end of year
Lev_2	Leverage defined as long-term liabilities divided by total assets at end of year
Intang/assets	Intangible assets divided by total assets at end of year
Tang/assets	Tangible assets divided by total assets at end of year
Reval/L.t. asset	Revaluation reserve divided by long term assets (= tangible fixed assets + intangible fixed assets at end of year)
No. of emp	Number of employees

The table reports the summary statistics on balance sheet variables for firm-years with data available to estimate regressions reported in either Tables 3 or 5. The statistics are reported separately for public listed firms and private firms. For each variable, the extreme 1% of the observations on each side is excluded.

Table 3

Regression of change in earnings on lagged change in earnings for all firm-years

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_4 DPR + \alpha_5 DPR * D\Delta NI_{t-1} + \alpha_6 * DPR * \Delta NI_{t-1} + \alpha_7 DPR * D\Delta NI_{t-1} * \Delta NI_{t-1} + \varepsilon_t$$

Panel A: Full sample						
	Dependent variable: ΔNI_t					
	before excep. items and x-ord items		**after excep. items, before x-ord items**		**after excep. items and x-ord items**	
	Coeff	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**
INTERCEPT (α_0)	-0.002	-0.99	-0.002	-1.53	-0.003	-2.09
$D\Delta NI_{t-1}$ (α_1)	-0.010	-2.75	-0.018	-6.78	-0.015	-5.53
ΔNI_{t-1} (α_2)	0.021	0.56	0.036	1.41	0.023	0.93
ΔNI_t *$D\Delta NI_{t-1}$ (α_3)	-0.618	-9.76	-0.743	-17.92	-0.718	-18.08
DPR (α_4)	0.004	2.02	0.005	3.27	0.006	3.72
DPR*$D\Delta NI_{t-1}$ (α_5)	0.008	2.10	0.015	5.71	0.013	4.62
DPR*ΔNI_{t-1} (α_6)	-0.146	-3.81	-0.175	-6.71	-0.170	-6.79
DPR*ΔNI_{t-1}*$D\Delta NI_{t-1}$ (α_7)	0.336	5.22	0.476	11.30	0.467	11.56
Adj-R-square (%)	6.61		7.27		7.55	
No. of obs	62903		128486		128405	
Panel B: Constant sample across all definitions of net income						
INTERCEPT (α_0)	-0.006	-2.40	-0.005	-2.11	-0.006	-2.36
$D\Delta NI_{t-1}$ (α_1)	-0.006	-1.39	-0.013	-2.59	-0.012	-2.36
ΔNI_{t-1} (α_2)	0.160	2.09	0.064	0.86	0.073	0.99
ΔNI_t *$D\Delta NI_{t-1}$ (α_3)	-0.638	-5.22	-0.659	-5.52	-0.661	-5.56
DPR (α_4)	0.009	3.72	0.010	3.92	0.011	4.12
DPR*$D\Delta NI_{t-1}$ (α_5)	0.002	0.55	0.009	1.84	0.008	1.58
DPR*ΔNI_{t-1} (α_6)	-0.315	-4.08	-0.247	-3.31	-0.257	-3.47
DPR*ΔNI_{t-1}*$D\Delta NI_{t-1}$ (α_7)	0.384	3.11	0.427	3.53	0.420	3.50
Adj-R-square (%)	6.68		7.09		7.36	
No. of obs	60957		60957		60957	

Variables:

Dependent variable:

ΔNI_t Change in earnings from year t-1 to year t, standardized by total assets at end of year t-1. Earnings are measured before (after) exceptional items and extra-ordinary items.

Independent variables:

$D\Delta NI_{t-1}$ =1, if $\Delta NI_{t-1} < 0$; =0, otherwise

DPR Dummy for private companies. =1 if private firm; else 0.

$SIZE_t$ logarithm of total assets at end of year t

The regressions exclude extreme 1% on each side for ΔNI_t and ΔNI_{t-1}.

Table 4

Regression of change in earnings on lagged change in earnings for all firm-years after controlling for size and industry effects

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_4 DPR + \alpha_5 DPR * D\Delta NI_{t-1} + \alpha_6 * DPR * \Delta NI_{t-1} + \alpha_7 DPR * D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_8 CON_t + \alpha_9 CON_t * DNI_{t-1} + \alpha_{10} * CON_t * \Delta NI_{t-1} + \alpha_{11} CON_t * DNI_{t-1} * \Delta NI_{t-1} + \varepsilon_t$$

Panel A: SIZE as control variable						
	Dependent variable: ΔNI_t					
	before excep. items and x-ord items		**after excep. items, before x-ord items**		**after excep. items and x-ord items**	
	Coeff	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**
INTERCEPT (α_0)	0.012	2.45	0.002	0.67	0.004	1.06
$D\Delta NI_{t-1}$ (α_1)	0.001	0.17	-0.001	-0.17	-0.001	-0.22
ΔNI_{t-1} (α_2)	0.467	5.92	0.443	8.32	0.406	7.71
$\Delta NI_t * D\Delta NI_{t-1}$ (α_3)	-1.036	-8.00	-1.048	-12.50	-0.968	-11.87
DPR (α_4)	0.004	1.25	0.005	2.22	0.004	1.76
$DPR * D\Delta NI_{t-1}$ (α_5)	0.000	0.03	0.009	2.60	0.009	2.57
$DPR * \Delta NI_{t-1}$ (α_6)	-0.398	-6.93	-0.326	-8.32	-0.288	-7.50
$DPR * \Delta NI_{t-1} * D\Delta NI_{t-1}$ (α_7)	0.500	5.21	0.528	8.63	0.494	8.39
$SIZE_t$ (α_8)	-0.002	-3.97	0.000	-1.13	0.000	-1.35
$SIZE_t * D\Delta NI_{t-1}$ (α_9)	-0.001	-1.16	-0.002	-3.93	-0.002	-3.86
$SIZE_t * \Delta NI_{t-1}$ (α_{10})	-0.035	-6.16	-0.043	-11.43	-0.045	-11.84
$SIZE_t * \Delta NI_{t-1} * D\Delta NI_{t-1}$ (α_{11})	0.046	5.04	0.043	7.16	0.038	6.46
Adj-R-square (%)	6.90		7.61		8.00	
No. of obs	61371		125091		125016	
Panel B: 3-digit SIC industry dummies as control variables						
INTERCEPT (α_0)	0.004	0.71	-0.006	-1.10	-0.005	-0.91
DNI_{t-1} (α_1)	-0.022	-2.18	-0.014	-1.71	-0.012	-1.44
ΔNI_{t-1} (α_2)	-0.012	-0.09	0.140	1.64	0.097	1.22
$\Delta NI_t * DNI_{t-1}$ (α_3)	-0.718	-2.94	-0.770	-4.55	-0.628	-3.96
DPR (α_4)	0.004	2.21	0.007	5.19	0.008	5.31
$DPR * DNI_{t-1}$ (α_5)	0.009	2.87	0.013	5.12	0.011	4.20
$DPR * \Delta NI_{t-1}$ (α_6)	-0.127	-2.48	-0.197	-5.34	-0.184	-5.04
$DPR * \Delta NI_{t-1} * DNI_{t-1}$ (α_7)	0.341	3.91	0.484	7.48	0.465	7.51
Adj-R-square (%)	7.80		8.30		8.70	
No. of obs	62903		128486		128405	

Table 4 (contd)

In Panel A, the interactive control variable (CON_t) is $SIZE_t$, while in Panel B the interactive control variables are industry dummies for each 3-digit SIC classification. Panel B does not report the coefficients for the interactive industry dummies. There are 349 3-digit sic codes in the sample. The regressions exclude extreme 1% on each side for ΔNIt, ΔNIt-1 and for $SIZE_t$ in addition in Panel

Variables:

Dependent variable:

ΔNI_t	Change in earnings from year t-1 to year t, standardized by total assets at end of year t-1. Earnings are measured before (after) exceptional items and extra-ordinary items.

Independent variables:

$D\Delta NI_{t-1}$	=1, if $\Delta NI_{t-1} < 0$; =0, otherwise
DPR	Dummy for private companies. =1 if private firm; else 0.
$SIZE_t$	logarithm of total assets at end of year t

Table 5

Regression of accruals on change in cash from operations for all firm-years

$$ACC_t = \beta_0 + \beta_1 * D\Delta CFO_t + \beta_2 * \Delta CFO_t + \beta_3 * D\Delta CFO_t * \Delta CFO_t + \beta_4\ DPR + \beta_5 * DPR * D\Delta CFO_t + \beta_6 * DPR * \Delta CFO_t + \beta_7\ DPR * D\Delta CFO_t * \Delta CFO_t + \beta_8 * SIZE_t + \beta_9 * SIZE_t * D\Delta CFO_t + \beta_{10} * SIZE_t * \Delta CFO_t + \beta_{11}\ SIZE_t * D\Delta CFO_t * \Delta CFO_t + \nu_t$$

	REGN I		REGN II		REGN III	
	Coeff	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**
INTERCEP (β_0)	-0.034	-10.68	-0.052	-7.39	-0.039	-3.71
$D\Delta CFO_t$ (β_1)	0.012	2.51	0.034	3.38	0.019	1.31
ΔCFO_t (β_2)	-0.432	-19.02	-0.171	-3.94	-0.403	-5.17
$D\Delta CFO_t * \Delta CFO_t$ (β_3)	0.228	6.83	0.198	3.19	0.347	3.26
DPR (β_4)	0.000	-0.12	0.005	1.23	-0.002	-0.90
DPR*$D\Delta CFO_t$ (β_5)	0.002	0.43	-0.005	-0.78	0.002	0.50
DPR*ΔCFO_t (β_6)	0.044	1.91	-0.035	-1.10	0.053	1.81
DPR*$D\Delta CFO_t * \Delta CFO_t$ (β_7)	-0.127	-3.77	-0.106	-2.34	-0.137	-3.03
$SIZE_t$ (β_8)			0.002	3.55		
$SIZE_t * D\Delta CFO_t$ (β_9)			-0.003	-3.37		
$SIZE_t * \Delta CFO_t$ (β_{10})			-0.028	-9.33		
$SIZE_t * D\Delta CFO_t * \Delta CFO_t$ (β_{11})			0.003	0.58		
Interactive 3-digit SIC industry dummies					Not reported	
Adj-R-square (%)	37.29		37.70		39.99	
No. of obs	72989		71139		72989	

Variables:

Dependent variable:

ACC_t Accruals in year t, standardized by beginning total assets. Accruals are defined as earnings before exceptional items and extra-ordinary items minus cash from operations.

Independent variables:

ΔCFO_t Change in cash from operations (CFO_t) from t-1 to t, standardized by total assets at end of t-1. CFO_t is defined as earnings before exceptional items and extra-ordinary items in period t + Depreciation - Δ(Working capital)

Δ(Working capital) = ΔInventory + ΔDebtors + ΔOther current assets – ΔCreditors – ΔOther current liabilities

$D\Delta CFO_t$ =1, if CFO_t<0; =0, otherwise.

DPR Dummy for private companies. =1 if private firm; else 0.

$SIZE_t$ Logarithm of total assets at end of year t

LEV_t Leverage defined as long-term debt divided by total assets at end of year t

The regressions exclude extreme 1% on each side for ACC_t and ΔCFO_t. In addition, Regression II excludes extreme 1% on each side of $SIZE_t$.

Table 6
Regression of change in earnings on lagged change in earnings for public and private firm-years matched on size, industry and fiscal year-end.

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_4 DPR + \alpha_5 DPR * D\Delta NI_{t-1} + \alpha_6 * DPR * \Delta NI_{t-1} + \alpha_7 DPR * D\Delta NI_{t-1} * \Delta NI_{t-1} + \varepsilon_t$$

Dependent variable: ΔNI_t	**before excep. items and x-ord items**		**after excep. items, before x-ord items**		**after excep. items and x-ord items**	
	Coeff	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**
INTERCEPT (α_0)	-0.002	-0.49	-0.002	-0.46	-0.001	-0.26
$D\Delta NI_{t-1}$ (α_1)	-0.002	-0.22	-0.019	-3.16	-0.024	-3.93
ΔNI_{t-1} (α_2)	-0.024	-0.36	0.007	0.16	-0.005	-0.13
$\Delta NI_t * D\Delta NI_{t-1}$ (α_3)	-0.341	-2.50	-0.542	-6.66	-0.616	-7.89
DPR (α_4)	0.004	0.65	0.005	1.03	0.005	0.94
$DPR * D\Delta NI_{t-1}$ (α_5)	0.003	0.30	0.008	0.91	0.014	1.67
$DPR * \Delta NI_{t-1}$ (α_6)	-0.205	-1.54	-0.254	-2.79	-0.296	-3.54
$DPR * \Delta NI_{t-1} * D\Delta NI_{t-1}$ (α_7)	0.403	1.79	0.343	2.34	0.580	4.27
Adj-R-square (%)	2.71		5.69		7.14	
No. of obs	662		1590		1594	

Variables:

Dependent variable:

ΔNI_t Change in earnings from year t-1 to year t, standardized by total assets at end of year t-1. Earnings are measured before (after) exceptional items and extra-ordinary items.

Independent variables:

$D\Delta NI_{t-1}$ =1, if $\Delta NI_{t-1} < 0$; =0, otherwise

DPR Dummy for private companies. =1 if private firm; else 0.

For each private firm/year observation, we chose, without replacement, a matched firm from all listed firms in the same 2-digit SIC code with the same fiscal year-end. The matched firm has the closest value of year-end total assets to that of the private firm, subject to the requirement that they differ by no more than 5%. The regression excludes extreme 1% on each side for ΔNI_t and ΔNI_{t-1}. If one firm in a matched pair is excluded based on above exclusion criterion, the other firm in the pair is also excluded from the analysis.

Table 7

Regression of accruals on change in cash from operations for public and private firm-years matched on size, industry and fiscal year-end

$$ACC_t = \beta_0 + \beta_1 * D\Delta CFO_t + \beta_2 * \Delta CFO_t + \beta_3 * D\Delta CFO_t * \Delta CFO_t + \beta_4\ DPR + \beta_5 * DPR * D\Delta CFO_t + \beta_6 * DPR * \Delta CFO_t + \beta_7\ DPR * D\Delta CFO_t * \Delta CFO_t + \beta_8 * SIZE_t + \beta_9 * SIZE_t * D\Delta CFO_t + \beta_{10} * SIZE_t * \Delta CFO_t + \beta_{11}\ SIZE_t * D\Delta CFO_t * \Delta CFO_t + \nu_t$$

	REGN I		REGN II	
	Coeff	**t-stat**	**Coeff**	**t-stat**
INTERCEPT(β_0)	-0.029	-3.86	-0.061	-1.18
$D\Delta CFO_t$ (β_1)	0.018	1.71	0.054	0.74
ΔCFO_t (β_2)	-0.471	-10.43	0.391	1.36
$D\Delta CFO_t * \Delta CFO_t$ (β_3)	0.363	5.66	-0.029	-0.06
DPR (β_4)	-0.010	-0.92	-0.006	-0.53
DPR*$D\Delta CFO_t$ (β_5)	0.003	0.21	-0.001	-0.07
DPR*ΔCFO_t (β_6)	0.103	1.51	0.037	0.50
DPR*$D\Delta CFO_t * \Delta CFO_t$ (β_7)	-0.326	-3.20	-0.259	-2.34
$SIZE_t$ (β_8)			0.003	0.63
$SIZE_t * D\Delta CFO_t$ (β_9)			-0.004	-0.52
$SIZE_t * \Delta CFO_t$ (β_{10})			-0.090	-2.98
$SIZE_t * D\Delta CFO_t * \Delta CFO_t$ (β_{11})			0.038	0.76
Adj-R-square (%)	37.80		36.43	
No. of obs	780		760	

Variables:

Dependent variable:

ACC_t Accruals in year t, standardized by beginning total assets. Accruals are defined as earnings before exceptional items and extra-ordinary items minus cash from operations.

Independent variables:

ΔCFO_t Change in cash from operations (CFO_t) from t-1 to t, standardized by total assets at end of t-1. CFO_t is defined as earnings before exceptional items and extra-ordinary items in period t + Depreciation - Δ(Working capital)

Δ(Working capital) = ΔInventory + ΔDebtors + ΔOther current assets – ΔCreditors – ΔOther current liabilities

$D\Delta CFO_t$ =1, if CFO_t<0; =0, otherwise.

DPR Dummy for private companies. =1 if private firm; else 0.

$SIZE_t$ Logarithm of total assets at end of year t

For each private firm/year observation, we chose, without replacement, a matched firm from all listed firms in the same 2-digit SIC code with the same fiscal year-end. The matched firm has the closest value of year-end total assets to that of the private firm, subject to the requirement that they differ by no more than 5%. The regression excludes extreme 1% on each side for ΔNI_t and ΔNI_{t-1}. Regression I excludes extreme 1% on each side for ACCt and ΔCFOt. In addition, Regression II excludes extreme 1% on each side of $SIZE_t$. If one firm in a matched pair is excluded based on above exclusion criterion, the other firm in the pair is also excluded from the analysis.

Table 8
Analysis for sample of firm-years with Big-5 auditors

Panel A: Distribution of observations classified by Big-5 versus non-Big-5 auditors

	Public firm-years	Private firm-years
Non-Big-5 auditors (%)	1191 (24.13%)	102800 (83.26%)
Big-5 auditors	3745 (75.87%)	20669 (16.74%)

Panel B: Regression of change in earnings on lagged change in earnings for firm-years, Big 5 firm-years only

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_4 DPR + \alpha_5 DPR * D\Delta NI_{t-1} + \alpha_6 * DPR * \Delta NI_{t-1} + \alpha_7 DPR * D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_8 SIZE_t + \alpha_9 SIZE_t * D\Delta NI_{t-1} + \alpha_{10} * SIZE_t * \Delta NI_{t-1} + \alpha_{11} SIZE_t * D\Delta NI_{t-1} * \Delta NI_{t-1} + \varepsilon_t$$

	Dependent variable: ΔNI_t											
	before excep. and x-ord items				**after excep., before x-ord items**				**after excep. and x-ord items**			
	Coeff	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**
INTERCEPT (α_0)	-0.004	-1.55	-0.015	-1.64	-0.002	-0.97	-0.022	-3.41	-0.003	-1.54	-0.022	-3.33
$D\Delta NI_{t-1}$ (α_1)	-0.012	-2.74	-0.024	-1.57	-0.020	-6.38	0.002	0.18	-0.016	-5.10	0.002	0.19
ΔNI_{t-1} (α_2)	0.055	1.31	0.160	1.25	-0.032	-1.14	0.431	5.38	-0.046	-1.77	0.402	5.09
$\Delta NI_t * D\Delta NI_{t-1}$ (α_3)	-0.697	-10.52	-1.125	-5.10	-0.706	-15.58	-0.891	-6.46	-0.669	-15.36	-0.888	-6.58
DPR (α_4)	0.003	1.05	0.006	1.60	0.002	1.11	0.009	3.42	0.003	1.58	0.009	3.34
$DPR * D\Delta NI_{t-1}$ (α_5)	0.007	1.59	0.012	1.90	0.016	4.80	0.008	1.83	0.013	3.81	0.007	1.57
$DPR * \Delta NI_{t-1}$ (α_6)	-0.130	-2.89	-0.150	-2.61	-0.056	-1.89	-0.226	-6.02	-0.055	-1.96	-0.197	-5.39
$DPR * \Delta NI_{t-1} * D\Delta NI_{t-1}$ (α_7)	0.393	5.53	0.524	5.25	0.403	8.37	0.455	7.02	0.391	8.41	0.441	7.04
$SIZE_t$ (α_8)			0.001	1.35			0.002	3.10			0.002	3.03
$SIZE_t * D\Delta NI_{t-1}$ (α_9)			0.001	0.71			-0.002	-2.06			-0.002	-1.82
$SIZE_t * \Delta NI_{t-1}$ (α_{10})			-0.013	-1.12			-0.038	-5.46			-0.040	-5.80
$SIZE_t * \Delta NI_{t-1} * D\Delta NI_{t-1}$ (α_{11})			0.040	2.06			0.017	1.41			0.022	1.92
Adj-R-square (%)	5.84		5.53		6.99		6.59		7.21		6.81	
No. of obs	10821		10556		24634		23980		24602		23950	

Panel C: Regression of accruals on change in cash from operations, Big 5 firm-years only

$$ACC_t = \beta_0 + \beta_1 * D\Delta CFO_t + \beta_2 * \Delta CFO_t + \beta_3 * D\Delta CFO_t * \Delta CFO_t + \beta_4\ DPR + \beta_5 * DPR * D\Delta CFO_t + \beta_6 * DPR * \Delta CFO_t + \beta_7\ DPR * D\Delta CFO_t * \Delta CFO_t + \beta_8 * SIZE_t + \beta_9 * SIZE_t * D\Delta CFO_t + \beta_{10} * SIZE_t * \Delta CFO_t + \beta_{11}\ SIZE_t * D\Delta CFO_t * \Delta CFO_t + \nu_t$$

	REGN I		REGN II	
	Coeff	**t-stat**	**Coeff**	**t-stat**
INTERCEP (β_0)	-0.039	-11.15	-0.074	-5.43
$D\Delta CFO_t$ (β_1)	0.014	2.71	0.049	2.48
ΔCFO_t (β_2)	-0.391	-16.12	-0.197	-2.40
$D\Delta CFO_t * \Delta CFO_t$ (β_3)	0.188	5.14	0.348	2.98
DPR (β_4)	-0.004	-1.06	0.005	0.86
$DPR * D\Delta CFO_t$ (β_5)	0.001	0.23	-0.008	-0.95
$DPR * \Delta CFO_t$ (β_6)	0.007	0.28	-0.036	-0.97
$DPR * D\Delta CFO_t * \Delta CFO_t$ (β_7)	-0.086	-2.23	-0.134	-2.48
$SIZE_t$ (β_8)			0.003	2.88
$SIZE_t * D\Delta CFO_t$ (β_9)			-0.004	-2.21
$SIZE_t * \Delta CFO_t$ (β_{10})			-0.020	-2.90
$SIZE_t * D\Delta CFO_t * \Delta CFO_t$ (β_{11})			-0.015	-1.56
Adj-R-square (%)	35.53		36.36	
No. of obs	12375		12079	

Variables:

Dependent variables:

ΔNI_t Change in earnings from year t-1 to year t, standardized by total assets at end of year t-1. Earnings are measured before (after) exceptional items and extra-ordinary items.

ACC_t Accruals in year t, standardized by beginning total assets. Accruals are defined as earnings before exceptional items and extra-ordinary items minus cash from operations.

Independent variables:

$D\Delta NI_{t-1}$ =1, if $\Delta NI_{t-1} < 0$; =0, otherwise

DPR Dummy for private companies. =1 if private firm; else 0.

ΔCFO_t Change in cash from operations (CFO_t) from t-1 to t, standardized by total assets at end of t-1. CFO_t is defined as earnings before exceptional items and extra-

	ordinary items in period t + Depreciation - Δ(Working capital)
Δ(Working capital)	= ΔInventory + ΔDebtors + ΔOther current assets – ΔCreditors – ΔOther current liabilities
$D\Delta CFO_t$	=1, if $CFO_t<0$; =0, otherwise.
DPR	Dummy for private companies. =1 if private firm; else 0.
$SIZE_t$	Logarithm of total assets at end of year t

The sample for this table includes only firm-years with Big-5 auditors. Panel A of this table presents the distribution of firm-years classified by whether the firm used a Big-5 auditor or a non-Big-5 auditor in that year. Panels B reports results from regression of change in net income on lagged change in net income, while Panel C presents the results from regression of accruals on change in cash from operations. In each analysis, we exclude the extreme 1% of the continuous variables on each side.

Table 9
Yearly regressions of change in earnings on lagged change in earnings and of accruals on lagged change in cash flows

Panel A: Distribution by year of observations for various regressions

	ΔNI_t before excep. and x-ord items		ΔNI_t before excep., after x-ord items		ΔNI_t after excep. and x-ord items		Accruals estimate		Accruals actual	
	Listed	Private	Listed	Private	Listed	Private	Listed	Private	Listed	Private
1990	0	0	5	438	4	440	0	0	0	0
1991	0	0	295	6307	291	6307	0	0	0	0
1992	0	22	617	8142	611	8145	0	51	0	0
1993	0	197	430	14479	428	14469	1	621	0	0
1994	3	910	614	17953	613	17937	211	7080	0	0
1995	253	9722	713	19578	717	19561	501	11720	5	432
1996	588	13764	770	19351	770	19342	659	16117	232	3244
1997	678	17371	714	18423	713	18420	700	16960	608	8307
1998	654	16958	661	17195	660	17189	645	16034	614	7807
1999	130	1665	131	1687	132	1687	124	1594	120	710

Panel B : Annual coefficient and t-stat for α_7 and β_7, and Fama-Macbeth t-statistics

	ΔNI_t before excep. and x-ord items Coeff (α_7)	ΔNI_t before excep., after x-ord items Coeff (α_7)	ΔNI_t after excep. and x-ord items Coeff (α_7)	Accruals estimate Coeff (β_7)	Accruals actual Coeff (β_7)
1991		0.37	-0.01		
1992		0.18	0.11		
1993		0.74	0.64		
1994		0.59	0.66	0.51	
1995	0.51	0.67	0.43	0.14	
1996	0.23	0.52	0.54	0.01	-0.20
1997	0.09	0.44	0.44	0.83	-0.04
1998	0.22	0.37	0.35	-0.29	-0.11
1999	-0.03	0.18	0.45	-0.52	-0.39
Average Coeff.	0.20	0.45	0.40	0.12	-0.19
F-M t-stat	2.26	6.81	5.36	0.57	-2.43

Table 9 (contd)

The coefficients and t-stats are from below individual-year regressions:

$$ACC_t = \beta_0 + \beta_1 * D\Delta CFO_t + \beta_2 * \Delta CFO_t + \beta_3 * D\Delta CFO_t * \Delta CFO_t + \beta_4\ DPR + \beta_5 * DPR * D\Delta CFO_t + \beta_6 * DPR * \Delta CFO_t + \beta_7\ DPR * D\Delta CFO_t * \Delta CFO_t + \nu_t$$

$$\Delta NI_t = \alpha_0 + \alpha_1 D\Delta NI_{t-1} + \alpha_2 \Delta NI_{t-1} + \alpha_3 D\Delta NI_{t-1} * \Delta NI_{t-1} + \alpha_4 DPR + \alpha_5 DPR * D\Delta NI_{t-1} + \alpha_6 * DPR * \Delta NI_{t-1} + \alpha_7 DPR * D\Delta NI_{t-1} * \Delta NI_{t-1} + \varepsilon_t$$

Variables:

Dependent variables:

ΔNI_t	Change in earnings from year t-1 to year t, standardized by total assets at end of year t-1. Earnings are measured before (after) exceptional items and extra-ordinary items.
ACC_t	Accruals in year t, standardized by beginning total assets. Accruals are defined as earnings before exceptional items and extra-ordinary items minus cash from operations.

Independent variables:

$D\Delta NI_{t-1}$	=1, if $\Delta NI_{t-1} < 0$; =0, otherwise
DPR	Dummy for private companies. =1 if private firm; else 0.
ΔCFO_t	Change in cash from operations (CFO_t) from t-1 to t, standardized by total assets at end of t-1. CFO_t is obtained either from the cash flow statement or estimated as earnings before exceptional items and extra-ordinary items in period t + Depreciation - Δ(Working capital)
Δ(Working capital)	= ΔInventory + ΔDebtors + ΔOther current assets – ΔCreditors – ΔOther current liabilities
$D\Delta CFO_t$	=1, if $CFO_t < 0$; =0, otherwise.
DPR	Dummy for private companies. =1 if private firm; else 0.
$SIZE_t$	Logarithm of total assets at end of year t

"Avge coeff" is the simple average of the individual-year coefficients. "F-M t-stat" is the Fama-Macbeth ratio of the average coefficient to its standard error derived from the standard deviation of the time-series of coefficients. Qualitative results do not change when size is included in these regressions as an interactive variable. If a firm's fiscal year ends before June 1st, then year is defined for that financial statement as relating to the prior calendar year. Accruals estimate are obtained using cash flows estimated from changes in balance sheet items, while accruals actual are defined as the difference between operating profit and cash flow from operations (before interest and taxes) as reported in cash flow statement. The regressions exclude the extreme 1% on each side of the continuous variables.

Table 10
Regression of cash flow from operations on lagged net income and lagged change in net income for all firm-years

$$CFO_{t+1} = \alpha_0 + \alpha_1 NI_{t-1} + \alpha_2 I_{\Delta NI<0} + \alpha_3 I_{\Delta NI>=0}*\Delta NI_t + \alpha_4 I_{\Delta NI<0}*\Delta NI_t + \alpha_5 DPR + \alpha_6 DPR*NI_{t-1} + \alpha_7 DPR*I_{\Delta NI<0} + \alpha_8 DPR* I_{\Delta NI>=0}*\Delta NI_t + \alpha_9 DPR* I_{\Delta NI<0}*\Delta NI_t + \varepsilon_t$$

	Net income before excep. and x-ord items		**Net income after excep., but before x-ord items**		**Net income after excep. and x-ord items**	
	Coeff	**t-stat**	**Coeff**	**t-stat**	**Coeff**	**t-stat**
INTERCEPT	0.06	10.95	0.06	11.71	0.06	12.33
NI_{t-1}	0.91	19.31	0.92	21.33	0.91	20.96
$I_{\Delta NI<0}$	0.00	0.01	0.00	-0.08	0.00	0.00
$I_{\Delta NI>=0}*\Delta NI_{t-1}$	0.83	7.45	0.70	7.95	0.67	7.94
$I_{\Delta NI<0}*\Delta NI_t$	0.45	3.77	0.28	3.12	0.27	3.08
DPR	0.01	2.17	0.02	2.90	0.01	2.62
$DPR*NI_{t-1}$	-0.30	-6.13	-0.33	-7.41	-0.33	-7.25
DPR* $I_{\Delta NI<0}$	0.00	-0.26	0.00	-0.44	0.00	-0.60
DPR* $I_{\Delta NI>=0}*\Delta NI_{t-1}$	-0.23	-2.01	-0.19	-2.07	-0.17	-1.96
DPR* $I_{\Delta NI<0}*\Delta NI_{t-1}$	-0.14	-1.16	0.01	0.15	0.00	0.05
Adj-R-square (%)	0.12		0.11		0.11	
No. of obs	19204		23037		23025	

Variables:

Dependent variable

CFO_{t+1} Cash from operations in year t+1 as reported in the cash flow statement, standardized by total assets at end of year t.

Independent variables:

NI_{t-1} Net income in period t-1, standardized by total assets at end of year t-2

ΔNI_t Change in earnings from year t-1 to year t, standardized by total assets at end of year t-1. Earnings are measured before (after) exceptional items and extra-ordinary items.

$I_{\Delta NI<0}$ Indicator variable for negative earnings changes, =1, if $\Delta NI_{t-1} <0$; =0, otherwise

$I_{\Delta NI>=0}$ Indicator variable for non-negative earnings changes, =1, if $\Delta NI_{t-1}>=0$; =0, otherwise

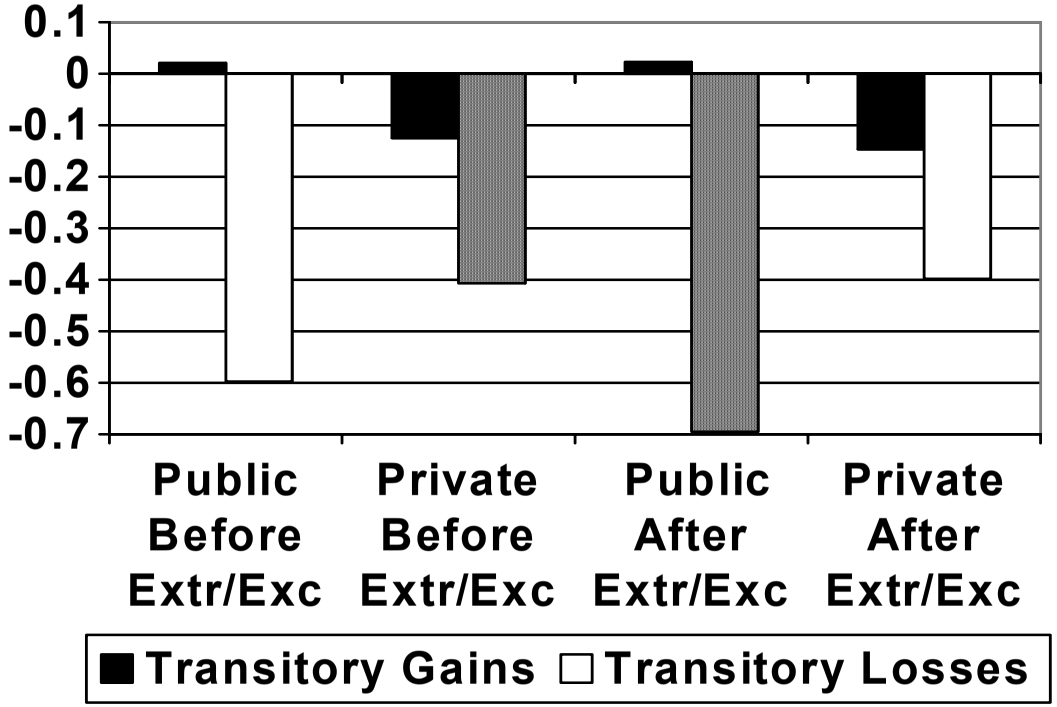
DPR Dummy for private companies. =1 if private firm; else 0.

The regressions exclude the extreme 1% on each side for the continuous variables.

Figure 1

Transitory Gains and Losses Incorporated in Income:
Public and Private U.K. Companies
Income Before and After Exceptional and Extra-ordinary Items

Serial dependence in income, indicated by slope coefficients in a pooled piecewise linear regression of change in accounting income on prior change in income, conditional on sign of prior change. Negative dependence (i.e., reversals of changes) indicates transitory gains and losses (proxies for economic gains and losses) incorporated in income as timely, non-persistent components.



Source: Summing the marginal regression coefficients in Table 3, Panel A as follows:

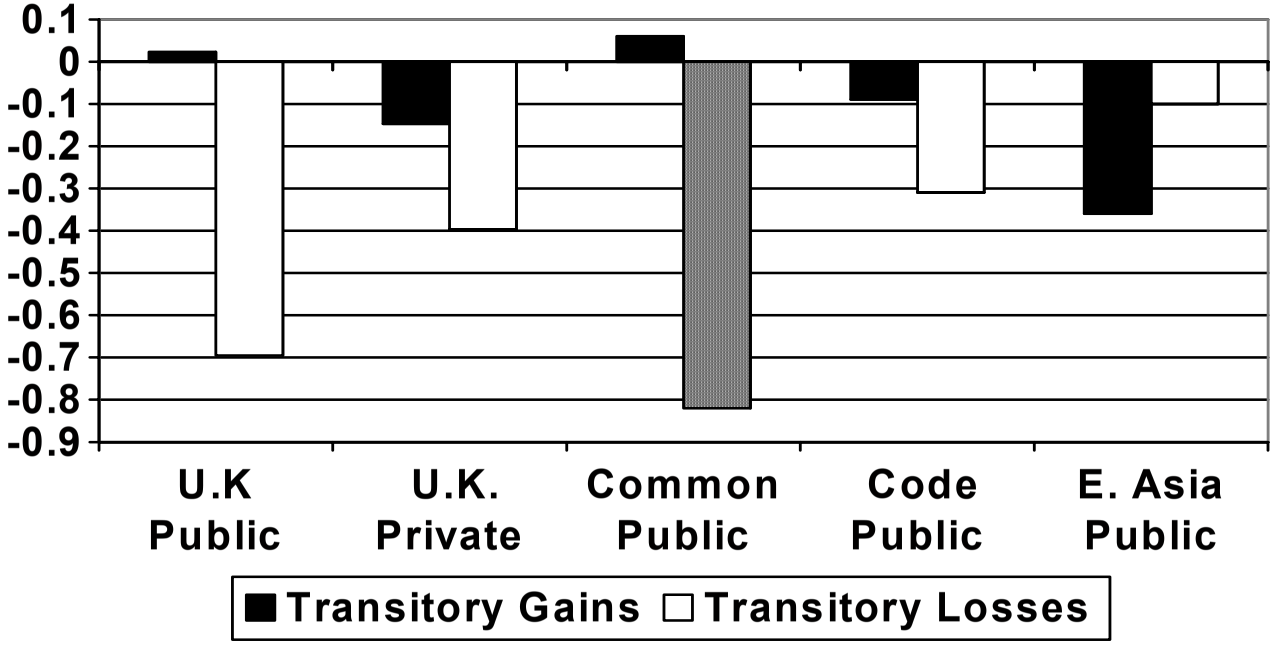
Public firm gains:	α_2
Public firm losses:	$\alpha_2 + \alpha_3$
Private firm gains:	$\alpha_2 + \alpha_6$
Private firm losses:	$\alpha_2 + \alpha_3 + \alpha_6 + \alpha_7$

Figure 2

Transitory Gains and Losses Incorporated in Income:
Public and Private U.K. Companies

Compared with Code-law, Common-law and East Asia Groups

Serial dependence in income, indicated by slope coefficients in a pooled piecewise linear regression of change in accounting income on prior change in income, conditional on sign of prior change. Negative dependence (i.e., reversals of changes) indicates transitory gains and losses (proxies for economic gains and losses) incorporated in income as timely, non-persistent components.



Sources: U.K. Public and U.K. Private from Table 3, Panel A; Common and Code from Ball and Robin (1999, Table 3); East Asia from Ball, Robin and Wu (2000a, Table 4). U.K. results are for income after exceptional and extra-ordinary items, for comparability with the other categories (Pope and Walker, 1999).