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A fundamentalist perspective on accounting and implications for accounting research

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A R T I C L E   I N F O

A B S T R A C T

This paper presents a framework for addressing normative accounting issues for reporting to shareholders. The framework is an alternative to the emerging Conceptual Framework of the International Accounting Standards Board and the Financial Accounting Standards Board. The framework can be broadly characterized as a utilitarian approach to accounting standard setting. It has two main features. First, accounting is linked to valuation models under which shareholders use accounting information to values their stakes. Second, the desirable characteristics of accounting information are inferred from the demand of investors and analysts who use the information in practice. This stands in contrast to the "qualitative characteristics" in the Boards' Framework which are embraced largely on the basis of their aesthetic appeal. These features lead to a set of broad accounting principles that resolve "recognition" and "measurement" issues at the core of the Boards' Conceptual Framework and also the central issue of a balance sheet approach versus an income statement approach. The framework in the paper also frames the research questions for researchers interested in accounting policy.
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1. Introduction

Accounting academics are involved in a variety of research, but one mission is paramount: to develop sound accounting principles. Accounting is so important to society, whether it be managerial accounting for a firm,

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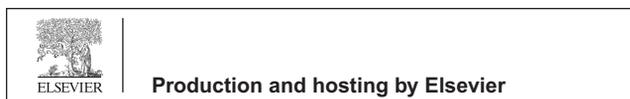
government accounting to its citizens, or financial accounting for investors of capital. Researchers are sometimes advised to avoid normative statements on accounting policy, but to deny this mission would be akin to a medical school that has no interest in healing patients. This paper ventures into financial accounting which plays such a critical role in the functioning of capital markets and resource allocation. We provide some recommendations but, more importantly, we provide a framework for researchers to grapple with the issue of what is "good accounting."

The question of what is "good accounting" absorbs the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) in the US. They struggle with the complexity of writing accounting standards with real dedication, but find themselves continually rewriting past standards – on revenue recognition, leases, pensions, off-balance sheet vehicles, restructurings, to name a few – or withdrawing from proposals – on fair value accounting for mortgages, for example. Some of this comes from dealing with complexity and adapting to changing conditions, and some from working in a political environment. But at the heart of the problem is the lack of an agreed-upon framework to guide standard setting and provide the cohesion and consistency that avoids a scatter approach.

The two boards appear to share this concern and have embarked upon a fresh conceptual framework project. Their endeavor starts with objectives and concepts. They then specify recognition and measurement principles that follow from these notions. "Recognition" determines what goes into financial statements and "measurement" dictates how they are measured. The sequencing of ideas appears to go as follows:

Objectives of Accounting

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Concepts Governing Accounting

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Recognition and Measurement Principles
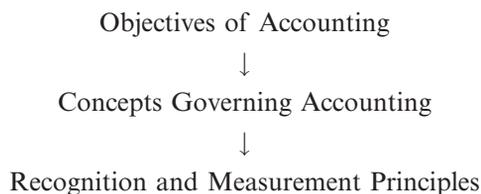
However, the project appears to be getting little traction.[1] Our guess is that the Boards' approach will not be successful, though we wish them well. The underlying concepts of "relevance," "neutrality," "faithful representation," and "comparability" that they propose are admirable and hardly ones to disagree with. But these concepts are too broad to cut through to a solution on a particular accounting issue and do not connect in any concrete way to what users look for in financial reports. In the Recognitions stage, they state definitions of assets and liabilities to which future accounting must conform. This promotes a legalistic approach that ties accounting to those definitions, rather than to the users' needs, while entrapping preparers in a cobweb of accounting minutiae over interpretation of definitions. Complexity becomes the dominating characteristic. Anchoring accounting to a Hicksian definition of income and a "balance sheet approach" (as tentatively proposed by the Boards) has little resonance with analysts.[2]

This paper takes a utilitarian approach: we examine accounting policy from the perspective of a user, specifically the fundamental analyst who uses financial statements to value firms. "Fundamental analysis" involves assessing firm value from an understanding of business fundamentals, but those fundamentals are often observed through accounting numbers like sales, profit margins, balance sheet debt, and so on. Indeed, fundamental analysis is sometimes viewed as the processing of accounting information. What accounting helps the fundamentalist and what accounting frustrates her? Is it fair value accounting? Historical cost accounting? Rather than appealing to accounting concepts such as a "balance sheet approach," or specifying "fair value" or "historical cost" as an (in)appropriate "measurement attribute," we ask: what does the fundamental investor need? In so doing, we take the view that financial statements are a product and thus the accounting problem is one of product design, tailored to the customer: what does the customer need?[3]

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[1] The two Boards released an exposure draft for the first stage of the project in May, 2008, covering the objectives of financial reporting and qualitative characteristics to govern accounting standards. They completed this stage in September 2010 and have since published proposals on Elements and Recognition and the Reporting Entity Concept. Currently, the Boards are conducting discussions on Measurement. See www.ifrs.org and www.fasb.org on the Conceptual Framework pages.

[2] A more detailed commentary on the initial stages of the Conceptual Framework project is in "A Framework for Financial Accounting Standards: Issues and a Suggested Framework," *Accounting Horizons* 24 (September 2010), 471–485, by the American Accounting Association Financial Accounting Standards Committee (James Ohlson and Stephen Penman, principal authors).

[3] This product design perspective is outlined in Penman, S. "Eye on the Prize: Directions for Accounting Research," *China Accounting Review*, vol. 6, no. 4 (December 2008), 465–476.

In the stated objectives in their conceptual framework, the two Boards have the investor very much in mind. We firmly embrace that objective of the Boards to provide information "about the amount, timing and uncertainty of future cash flows" to equity investors and "how those cash flows affect the prices of their equity interests." But, again, we find this too broad, lacking direction as to the specific accounting that satisfies the objective. One needs to cut to the quick: what is the accounting that the user requires to forecast cash flows?

The answer to this question might be solicited by going to investors and analysts directly and posing the question. Indeed, the accounting Boards have been very keen to get the opinions of analysts. It appears, however, that this approach does not elicit clear recommendations. For example, the leadership of the CFA Institute has come out strongly in favor of fair value accounting, while their rank-and-file working analysts seem to have a different opinion. The Boards' recent insurance proposals have been controversial among analysts, with some endorsement (largely in Europe) and some strong opposition (largely in the US). We suspect the reason is that analysts use accounting data in very different ways; there is no common platform for carrying out analysis.

We take a different approach. First, we show how accounting numbers connect to valuation, providing a starting point from which to examine accounting issues from an investor's point of view. This is done, in Section 2, by stating two formal relations, one that connects accounting numbers to price and one that connects accounting numbers to stock returns. These relations come from accounting research, a statement of what research to date has put on the table. So, they also serve as a point of departure for our suggestions for future research at the end of the paper. But, these formal expressions go only so far in directing the actual form that accounting should take. So, in Section 3, we articulate the demands of the fundamental analyst, the consumer of financial reports. This is done by stating a set of principles of "good practice" for fundamental analysis that conveys the type of information that the analyst desires. Finally, in Section 4, we overlay these "good practice" principles on the framework in Section 2 to reach conclusions about the form of "good accounting" that supports "good practice." The following summarizes how we move from the valuation equations in Section 2 via the principles of fundamental analysis in Section 3 to the accounting principles in Section 4.

Valuation Principles

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Analysis Principles

↓

Accounting Principles
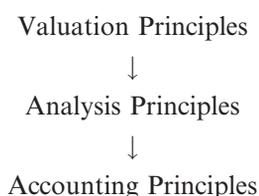
While the formal modeling in Section 2 is established in past research, the most conditional part of our analysis – to which the reader may take exception – is the statement of "good practice" principles in Section 3. All policy research must start with normative statements and we choose to make normative statements about practice to resolve accounting issues. These principles of good practice are not of our choosing, but rather gleaned from writings on fundamental analysts over many years. They are principles which an analyst can hardly disagree with; indeed, we believe they are commonly accepted. However, the acceptance of our framework largely rests on the reader's appreciation that these principles make good sense for practice against alternatives that may be offered. The principles stand in contrast to the IASB and FASB approach: rather than specifying desirable "qualitative characteristics" of information *a priori*, we infer those characteristics from the demand by users. In contrast to the Boards' concepts, our principles cut to the quick, producing immediate accounting recommendations. One critical issue of accounting policy is the contentious choice of a "balance sheet approach" versus an "income statement approach." This is resolved within our framework.

We hasten to state that the focus on the equity analyst (and the equity investor) is not the only relevant perspective; there are other users of financial statements, and indeed, the Boards see their task as accounting for all investors. Indeed, the Boards take an "entity perspective" in their conceptual framework, while we take a "proprietorship perspective" where the focus is on accounting to shareholders, the owners. Our analysis is not necessarily definitive, just one that we are able to put on the table – to be evaluated against alternatives that others may offer. When available, we bring the results of research to the issue but, regrettably, research is short on answering normative questions. The gap in relevant research points to research questions, underscoring a secondary goal of the paper: to provide direction to research on accounting policy issues.

2. Connecting prices and investment returns to accounting numbers

A primary objective in the IASB and FASB conceptual framework documents is to provide information about future cash flows. But, the stated objective does not point to how this is to be done: balance sheets, income statements and their details are presumably important, but how do these financial statements connect to future cash flows and to value? This section lays out models that sharpen up the idea. The models come directly from research. The first is the standard residual income model that connects accounting numbers to equity value. The second is an expression that connects stock returns to accounting numbers.

2.1. Connecting accounting numbers to equity value

When it comes to equity investing, the cash flows that the Boards wish to forecast are dividends – the cash flows to shareholders. The standard dividend discount model expresses the idea:

$$Value_0 = \frac{Dividend_1}{1+r} + \frac{Dividend_2}{(1+r)^2} + \frac{Dividend_3}{(1+r)^3} + \ldots\ldots \tag{1}$$

where r is the discount rate (the required return for risk borne) and the ellipsis points indicate that, for a going concern like a business, the forecasts continue indefinitely into the future. (Variables subscripted $t > 0$ are expected values here and in what follows.) There is no controversy about this model: it embeds the principle on which sound valuation must be based.[4]

The key is to connect accounting numbers to expected dividends and thus to value. Accounting, in fact, imbeds an operation that precisely does this, in the form of the clean surplus relation that governs the articulation of the income statement and balance sheet: *Book Value$_t$ = Book Value$_{t-1}$ + Earnings$_t$ − Net Dividends$_t$* or, in more operational terms, earnings for a period are closed to book value and dividends are paid out of book value.[5] Accordingly, *Net Dividends$_t$ = Earnings$_t$ − (Book Value$_t$ − Book Value$_{t-1}$)* so, substituting into the dividend discount model and iterating over future periods,

$$Value_0 = B_0 + \frac{Earnings_1 - r \cdot B_0}{1+r} + \frac{Earnings_2 - r \cdot B_1}{(1+r)^2} + \frac{Earnings_3 - r \cdot B_2}{(1+r)^3} + \ldots\ldots \tag{2}$$

where B is book value and $Earnings_t - r \cdot B_{t-1}$ is referred to as residual income. The equivalence of model (2) with model (1) says that one recognizes that there is value on the balance sheet (in the book value) and then utilizes information that forecasts future earnings. If those forecasted earnings cover the required return applied to book value, one adds value to the balance sheet. Book value is value that has already been recorded (on the balance sheet), while the remainder is value that has not yet been recorded on the balance sheet – it is value that is expected to be booked to the balance sheet in the future.[6]

It is remarkable that accounting, in the form it has been practiced for centuries, ties so elegantly to value. Further, with only a mild additional condition (that is also honored in accounting as practiced) – dividends are

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[4] The model is attributed to John Burr Williams, *The Theory of Investment Value* (Cambridge, MA: Harvard University Press, 1938), though the idea of present value as a measure of wealth is due to Irving Fisher earlier. The model is essentially a statement of the no-arbitrage idea: present value must bear a no-arbitrage relationship to expected future cash flows, such that value must be the price at which one expects to earn the required return for the risk assumed, no more, no less.

[5] The earnings must be comprehensive earnings, so the clean surplus relation is not strictly applied under IFRS or GAAP because "other comprehensive income" is booked directly to equity book value, bypassing the income statement.

[6] The residual earnings model has had a long history. In the early part of the 20th century, the idea that a firm's value was based on "excess profits" was firmly established in the United Kingdom. The model is in the German literature of the 1920s and 1930s, particularly in the writings of Schmalenbach. In the US, Gabriel Preinreich, an accounting and valuation theorist associated with Columbia University in the 1930s and 1940s, wrote extensively on the model, including "The Fair Value and Yield of Common Stock," *The Accounting Review* (1936), 130–140 and "Annual Survey of Economic Theory: The Theory of Depreciation," *Econometrica* 6 (1938), 219–41. In a 1941 paper, Preinreich recognizes the model in a prize essay by a student, J. H. Bourne in *Accountant*, London, 22 September 1888, pp. 605–606 (as referenced by Prenireich). Some relatively recent expositions of the residual earnings model are in E. Edwards and P. Bell, *The Theory and Measurement of Business Income* (Berkeley: University of California Press, 1961), 48–54 and 66–69, Ken Peasnell, "Some Formal Connections Between Economic Values and Yields and Accounting Numbers," *Journal of Business Finance and Accounting* (1982), 361–381. The residual income model has been brought to the fore in modern academic research by James Ohlson, "Earnings, Book Values, and Dividends in Equity Valuation," *Contemporary Accounting Research* 12 (1995), 661–687.

not included in earnings but are paid out of book value – the accounting-based valuation in model (2) honors the Miller and Modigliani principle of dividend irrelevance, so foundational to modern finance.[7]

However, with a view to establishing accounting principles, it is important to recognize that only one accounting principle is involved in model (2), the clean surplus relation. So, at this point, only one normative statement can be made: accounting should clearly report comprehensive income, for the equivalence of the model with the dividend discount model only holds if earnings are comprehensive.[8] In all other respects, the model is mute on the accounting. Indeed, the model holds for random accounting numbers! Clearly, something else has to be brought to the table, and that we do in the next section of the paper. But one point is clear: the expression divides value between book value (already booked to the balance sheet) and value expected to be booked in the future. Dividends aside, book value is increased by earnings, by the clean-surplus relation, so it is a question of the timing of earnings recognition. That, of course, just reinforces the point that accrual accounting is a question of allocation of earnings to periods.

To make the point in the extreme, one can always apply an accounting whereby all expectations of the future are booked to book value such that

$$Value_0 = Book\ Value_0 \tag{2a}$$

(and expected residual income is zero). That, of course, is a form of fair value accounting. Is that the accounting that the fundamental analyst requires? The answer resolves around the question: how much anticipation of the future should be brought into the financial statements? This is the critical "recognition" question in accounting. It recasts the question in the Recognition stage of the IASB and FASB conceptual framework project. It is the question to which we return in Section 4.

2.2. Connecting accounting numbers to stock returns

Via the same clean-surplus relation, accounting connects to stock returns. Substituting

$d_t = Earnings_t - (B_t - B_{t-1})$ into the stock return, $P_t + d_t - P_{t-1}$,

$$Stock\ return_t = Earnings_t + (P_t - B_t) - (P_{t-1} - B_{t-1}) \tag{3}$$

This expression says that the stock return is always equal to earnings for the period plus the change in the premium over book value (price minus book value). If there is no change in premium, then the stock returns is equal to earnings. The expression first appears in Easton, Harris and Ohlson (1992),[9] but textbooks of old used to state it in terms of the canceling error property of accounting: accounting may have error in the balance sheet (by carrying book value different from price), but earnings supply all the information for stock returns if the error is the same at the end of the period as at the beginning (that is, the errors cancel). Alternatively stated, earnings are sufficient for stock returns under this condition. Accordingly, accounting can tolerate error in the balance sheet, up to a constant, and still be perfectly informative; accounting that aims at a balance sheet that is sufficient for value, as in model (2a) is not necessary. We take this insight to the issue of accounting principles in Section 4.

The IASB and FASB objective is to provide information about the amount and *uncertainty* of future cash flows. Value is the present value of forecasted cash flows, discounted for uncertainty, so another possible dimension of accounting is to provide information about the discount rate. Couched in terms on the accounting valuation in model (2), the discount rate, *r*, is that which discounts expected residual income.

The discount rate is also called the cost of capital or the expected return for risk borne. Expression (3) can also be stated in terms of expected returns by rolling 1 year forward:

[7] See James Ohlson, "Earnings, Book Values, and Dividends in Equity Valuation," *Contemporary Accounting Research* 12 (1995), 661–687 which is a foundational paper that recognizes that accounting imbeds the same foundational propositions of modern finance.

[8] More strictly, the equivalence holds only if expected future earnings are comprehensive. So, to the extent that "other comprehensive income" has components with mean zero expectation (like unrealized gains and losses and currency gains and losses), the current IFRS and GAAP treatment of bypassing the income statement with other comprehensive income is of no consequence.

[9] See Easton, P., T. Harris and J. Ohlson, "Aggregate accounting earnings can explain most of security returns: The case of long event windows," *Journal of Accounting and Economics* 15 (1992), 119–142.

$$E(P_{t+1} + d_{t+1} - P_t) = E[Earnings_{t+1} + (P_{t+1} - B_{t+1}) - (P_t - B_t)]$$

Dividing through by P_t to yield the expected rate-of-return,

$$E\left(\frac{P_{t+1} + d_{t+1} - P_t}{P_t}\right) = E(R_{t+1}) = \frac{E(Earnings_{t+1})}{P_t} + E\left(\frac{(P_{t+1} - B_{t+1}) - (P_t - B_t)}{P_t}\right) \tag{4}$$

While expression (3) gives insights into balance sheet versus income statement measurement, expression (4) gives insights into how accounting might provide information about the discount rate, as we will see.

However, while these expressions connect accounting to prices, returns and expected returns, they are mute on the form of the accounting. Something else needs to be brought to the issue. With a focus on the user, we do this by stating a number of principles of practice.

3. Fundamentalist principles of practice

The IASB and FASB conceptual framework starts with principles (like "relevance," "faithful representation," and "neutrality") that define the characteristics of information to be supplied. We too start with principles that characterize the information, but they are principles that have to do with the demand for information. They are normative, albeit gleaned from practice. Normative statements are, of course, unavoidable: any normative analysis must start with normative statements.

The standard mantra of the fundamentalist is: price is what you pay, value is what you get. In contrast to those who see prices as an "efficient" measure of fair value, the fundamentalist sees price as speculative and potentially different from value. So she carries out an analysis of the fundamentals to challenge the market price. In doing so, she adheres to three principles:

1. *Understand what you know and separate what you know from speculation.*
2. *Anchor a valuation on what you know rather than speculation.*
3. *When valuing a firm to challenge the price, do not put price in the calculation.*

These principles are gleaned from the writings of fundamental investors over many years, particularly Benjamin Graham.[10] Graham spoke of "value justified by the facts" and "minimum true value" versus "speculative value."[11] The principles are simply "common sense," distilled from human experience in coping with uncertainty.

The first two principles give more specificity to the relevance and reliability concept that appear so often in concept documents of the FASB. These concepts are often presented as tradeoffs: to get relevance, one gives up reliability (and that is said to be OK). But the fundamentalist says not to mix speculative information (that may be relevant) with reliable information, for it is reliable information to which she anchors to challenge speculative stock prices. The fundamentalist understands that prices are speculative and wants reliable accounting reports for anchoring a valuation. The fundamentalist implicitly says to the accountant: do not mix the two; tell me what you know, but leave the speculation to me. Otherwise, I lose an anchorage. Benjamin Graham decomposed value as follows:

Value = Minimum true value + Speculative value

With a little license (with accounting in mind) this might be restated as:

[10] Graham's treatise, *The Intelligent Investor*, rev. ed. (New York: Harper and Row, 1973) outlines many of the ideas. The first edition was published in 1949, and a reprint in 2005 with a preface by Warren E. Buffett. His other classic, with considerably more on technique, is Benjamin Graham, David L. Dodd, and Sidney Cottle, *Security Analysis: Principles and Technique* 4th ed. (New York: McGraw-Hill Book Company, Inc., 1962). The first edition, authored by Graham and Dodd, was published in 1934. A later incarnation is Sidney Cottle, Roger Murray, and Frank Block, *Graham and Dodd's Security Analysis*, 5th ed. (New York, McGraw-Hill Book Company, 1988). A more recent book that follows the same principles is Bruce C. N. Greenwald, Judd Kahn, Paul D. Sonkin, and Michael van Biema, *Value Investing: From Graham to Buffett and Beyond* (New York: John Wiley & Sons, Inc., 2001).

[11] See Graham, B., "The Future of Financial Analysis," *Financial Analysts Journal* 16 (May–June 1963), 65–70 where he warns to separate "minimum true value" from speculative value. In "A Conversation with Benjamin Graham" in the *Financial Analysts Journal* (September–October 1976), pp. 20–23, Graham also distinguishes "investment characteristics" from "speculative characteristics" of stocks.

Value = Anchoring accounting value + Speculative value

The accountant supplies information for the first component in the financial statements but does not contaminate that anchoring information with speculative information. Anchoring information might include current sales but not speculation about future sales (in a "fair value" discounted cash flow number, for example). Of course, information for speculation is also relevant and nothing here restricts disclosure of such below the line (in footnotes).

The anchoring idea and the need to supply accounting that challenges speculative stock prices is behind many of the accounting prescriptions later in this paper. With the stock market in China so volatile – some claim it is not well aligned with fundamentals – we hope that these ideas are appealing. The third fundamentalist principle is pertinent: if one is to challenge price with a value, then price cannot be part of the calculation of value. This, of course, bears directly on mark-to-market accounting that includes market prices in financial statements.

4. Accounting principles for the fundamental analyst

Our analysis has the same end goal as the IASB and FASB conceptual framework: to establish recognition and measurement principles for the balance sheet and income statement. The burning issue of fair value accounting versus historical cost accounting is, of course, involved, but so are many other issues. For the balance sheet, the Boards have offered a set of definitions of assets and liabilities that govern recognition, with the measurement phase still in discussion.

Expressions (2)–(4) provide our starting point but, as said earlier, they do not take us far enough. While they state how an analyst connects accounting information to value and the discount rate, they are mute on the form of that accounting. Adding the principles of the last section carries us to conclusions about accounting. The accounting principles we state here are broad principles that are not detailed for every accounting issue that could arise. But we believe that the principles are operational enough such that the treatment of a specific issue can be inferred with little ambiguity.

4.1. Balance sheet approach versus income statement approach

For the valuation expression in Eq. (2), the clean surplus accounting relation connects accrual accounting numbers to cash flows. It is not just an equation, it is an actual accounting operation: start with the balance sheet, calculate earnings for the period, close earnings to book value (via the closing entry) and pay dividends out of book value. This, of course, is the accounting cycle taught in every beginning accounting class and (largely) applied in IFRS and GAAP.

The first issue that arises for a system of articulated income statements and balance sheets is whether to emphasize the balance sheet or the income statement, and the IASB and FASB rightly confront this issue. The "balance sheet approach," which appears to be favored in the Boards' conceptual framework discussions, focuses on measurement in the balance sheet, with the income statement being the residual; as, under clean surplus accounting, the income statement is just the change in the balance sheet (adjusted for net dividends), the income statement "falls out" as the difference between successive balance sheets. The Board has supported this notion by an appeal to one version of Hick's definition of income: income is the amount of wealth that a man can consume in a period and leave himself as well off at the end as at the beginning. Accordingly, the focus is on measuring wealth at the beginning and end of the period (in the balance sheet). In contrast, the "income statement approach," focuses on measurement of earnings for the period, with the balance sheet falling out as a transition between income statements, that is, for carrying balances that are not involved in income measurement. Put another way, the balance sheet approach focuses on the measurement of assets and liabilities (with equity the difference between the two), while the income statement approach focuses on revenues from trading with customers and the earnings derived there from after "matching" expenses incurred to generate the revenue.

For example, a balance sheet approach carries inventory at its fair value (what it is worth), whereas an income statement approach carries it on the balance sheet as cost that is not yet matched to revenue from

customers in the income statement. Under the income statement approach, inventory is a cost of trading with customers, but a cost that is recognized (as cost of goods sold) only upon a transaction with a customer; the cost is subtracted from sales to calculate value added from trading with customers. Accordingly, inventory cost is carried on the balance sheet until a sale is made. An income statement approach might recognize a deferred credit (liability) to effect matching of expenses to revenues in the income measurement, whereas the balance sheet approach would not see this as part of the balance sheet because it does not fit the definition of a "true" liability. The inventory example pertains to measurement, the deferred credit example to recognition.

Expression (3) in Section 2 provides insight into the issue of a balance sheet approach versus an income statement approach. Underlying the balance sheet approach is the idea that accounting is in error if the balance sheet does not convey the value of assets and liabilities. This idea is presumably behind the common claim that we need current values in the balance sheet and historical cost is "backward looking." But the returns–earnings expression (3) says that this is not necessarily correct. Accounting can tolerate error in the balance ($P - B$ different from zero): provided the error in the balance sheet is unchanged over the period, earnings are sufficient to imply stock returns. And, as value is expected stock returns (equal to expected earnings) capitalized, earnings are sufficient to infer value (and wealth); one can value from stocks of value (the balance sheet) but also from flows (earnings). In short, a balance sheet approach is not necessary because there is also an income statement. Of course, there is an issue when the premium changes.

The point is pertinent to the claim that the balance sheet is deficient if intangible assets are omitted. That is not the case: if an intangible asset (like a brand) is missing from the balance sheet, there is no issue if the earnings from the missing asset are coming through the income statement.[12] The point is also pertinent to the capitalization or expensing of R&D, or any investment in an intangible asset like human resources, brands, customer relationships, and supply chains. Expression (3) recognizes the canceling error property of accounting: it does not matter if one capitalizes and amortizes the expenditure or expenses it immediately if there is no change in the balance sheet error. That point is taught in first accounting class where the student is told that earnings are the same irrespective of whether R&D is capitalized and amortized or expensed immediately provided there in no growth in R&D expenditure (for growth induces a change in the premium, $P - B$).

The recognition of value of assets on the balance sheet, by putting brands on the balance sheet or by applying fair value accounting more generally, can add error that does not cancel but actually compounds. Estimating the value of a brand (for Coca-Cola Company, say) is subject to considerable error, thus putting a "fluffy" number on the balance sheet. But that error goes through to the income statement, because the income statement is just the difference in successive balance sheets. Indeed, the error is compounded, for the error in the income statement is affected by the balance sheet error at both the beginning and end of the period.[13] If one has a fuzzy balance sheet, it is less informative, but if one also loses the information in earnings, the loss is more general: such accounting could produce an uninformative balance sheet and also a less informative income statement. Coca-Cola is in fact relatively easy to value based on its historical cost earnings, a valuation that would be made more difficult under a balance sheet approach.

In sum, the discussion stresses that an income statement approach (with a focus on earnings measurement) is not only an alternative to a value approach in the balance sheet but also provides the correction to an imperfect balance sheet. Given that a perfect balance sheet is hard to achieve – value is hard to measure – this is an important point. And the discussion highlights that an attempt to provide a value balance sheet (that inevitably has measurement error) can actually destroy the earnings that compensate for error in the balance sheet. However, it does not have much to say about the measurement principles for the balance sheet and income statement. For that, we invoke the fundamentalist principles.[14]

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[12] This point is elaborated upon in Penman, S. "Accounting for Intangible Assets: There is Also an Income Statement," *Abacus*, vol. 45, no. 3 (September 2009), 359–371.

[13] This effect is demonstrated formally in Peasnell, K, 'Institution-specific Value', BIS Working Paper No. 210, August 2006.

[14] Many of the principles below are also found in "A Framework for Financial Accounting Standards: Issues and a Suggested Framework," *Accounting Horizons* 24 (September 2010), 471–485, by the American Accounting Association Financial Accounting Standards Committee (James Ohlson and Stephen Penman, principal authors). The framework for arriving at these principles differs, however, and is more akin to that in Penman, S., *Accounting for Value* (New York: Columbia University Press, 2011).

4.2. Recognition and measurement in the balance sheet

Expression (2) directs the analyst how to handle the balance sheet and income statement in valuation: start with the balance sheet, then add value to the balance sheet if earnings forecasts are in excess of those from the required return applied to book value. Or, in different words, anchor on the book value and then add speculation about future earnings.

The separation of the balance sheet, observed in the present (now), from speculative forecasts of the future is akin to the fundamentalists' separation of what we know from speculation. With the principle of anchoring on "what you know" rather than speculation, one can restate the division of value in Section 3 as follows:

Value = Anchoring balance sheet value + Value from speculative earnings forecasts

Fundamentalist principles require that the anchoring balance sheet be non-speculative. Thus, the principle for measurement in the balance sheet is stated as follows:

The balance sheet principle: The balance sheet rests on facts observed in current and past transactions and eschews speculation about future transactions.

The defining measurement comes from transactions where "transactions" refer to actual, verifiable events which the firm is drawn into, those that establish and change a firm's property rights and contractual obligations. Transactions stand in contrast to estimated future events that can be "relevant" but are speculative. In addition, transactions must be of "arms-length" and thus cut across self-dealing.

The reader can see that we are endorsing historical cost accounting versus accounting based on fair value estimates of the future, though better terminology might be "historical transaction accounting." Specifically excluded from the balance sheet are estimates of future transactions, for they are subjective – they are speculation. To the extent that estimates are used (for bad debt provisions, warranty liabilities, and the like), they are based on the evidential history of a firm's experience with transactions (of actual bad debts and warranty claims), not conjecture.

In more colloquial terms, the balance sheet that anchors the valuation must be "hard." "Soft," speculative intangible assets are not booked to the balance sheet. By "hard," we mean that the investor is assured that balance sheet accounting cannot come back to hit her later. Shunting liabilities off-balance sheet, with repercussions to follow, does not suit her. "Soft," speculative intangible assets are not booked to the balance sheet for those intangible assets are speculative, subject to future outcomes; they can come back to hit the investor if the asset value is not realized. Fair values put risk into the balance sheet – the value is an expected value that may not be realized – and thus are typically excluded.[15]

Conservative accounting broadly applies. When in doubt about carrying values, assets are impaired such that the balance sheet measure is not above estimated value. With revenues booked only from current transactions (and not expected future transactions), price-to-book ratios are thus expected to be above one, with the analyst adding value from speculative forecasts of future residual earnings.

4.3. Recognition and measurement in the income statement

With an anchoring to a hard balance sheet, speculation is added by the analyst to arrive at a value under the framework of Eq. (2). The income statement is the anchor for those forecasts. The anchoring principle for the income statement is:

The income statement principle: The income statement provides a forecast of what future income will be if current conditions prevail.

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[15] The exception of the one-to-one principle is recognized in Nissim, D. and S. Penman, *Principles for the Application of Fair Value Accounting*, Center for Excellence in Accounting and Security Analysis, Columbia Business School, White Paper No. 2, August 2007. The one-for-one principle refers to shareholder wealth moving one-to-one with market prices (in a liquid market), as with the price of a bond held as an investment. The principle typically holds for financing assets, but not for operations where value is added, not from market price movements, but from a business model that arbitrages input and output prices (costs and revenues) to make a profit, that is, trading with customers and suppliers.

Under this principle, the income statement provides the investor with a starting point for forecasting: to current income he or she adds speculation that conditions may be different in the future but, in absence of a forecasted change in conditions, future income will equal current income.

There are two aspects. First, revenues are based on actual trading with customers, not expectations of future revenues. Past sales are typically an indication of the ability to generate future sales, but speculation about future sales is left to the analyst.[16] Second, expenses are matched to revenues to calculate a measure of value added from sales (operating income) that informs about the profitability of sales under current conditions. Thus, if the analyst forecasts no sales growth in the near term, current operating income is a good indicator of future income. And, if the analyst forecasts sales will be different, a reliable income forecast is made by applying the current profit margin to those sales (after excluding one-time items that are clearly indicated). The analyst might use other information (besides accounting information) to forecast a change in the profit margin, but a forecast of a change in profit margin should not be affected by how the accountant currently calculates it; there should be no earnings reversals in the future simply because of the way the accounting is done. While conservatism in the balance sheet is desired (see above), excessive conservatism (that writes down assets too much and reverses the write down to the income statement in the future) is inconsistent with this principle. And so with "cookie jar" accounting that shifts income between periods. In short, accounting that lends itself to earnings management violates the principle.

4.4. The deferral principle and risk

In their objectives statement, the IASB and FASB aim to provide information about the amount and *uncertainty* of future cash flows. Imbedded in the balance sheet and income statement principles stated above is the following principle:

The deferral principle: Under uncertainty, earnings recognition is deferred until the uncertainty has been resolved.

With accounting based on transactions, earnings recognition is transaction-based, largely driven by revenue recognition via actual sales. While the analyst may speculate about future earnings and sales, and while prices may be based on expectations of future earnings, transaction-based accounting is conservative: earnings are not booked until the firm has a customer, that is, until the uncertainty surrounding the expected earnings is resolved with a transaction.

This principle ties accounting to risk. But, it also ties accounting to the expected return, the discount rate, by Eq. (4). If there is no expected change in the premium ($P - B$), then the expected return is equal to the expected earnings yield, as under the effective interest method for bonds with no change in interest rates. But, with an expected change in the premium, the expected return equals the expected earnings yield plus the price-denominated expected change in the premium. But, it is the deferral of the earnings that induces a change in the premium.[17]

In sum, the transactions accounting implied by the fundamentalist principles of Section 3 produce accounting that is revealing of risk and the required return for risk: a firm with considerable earnings expectations built into its stock price, but earnings that have not yet been booked by transactions accounting is risky. Empirical evidence suggests that this is so.[18] In contrast, fair value accounting puts risk into the balance sheet and thus this feature is lost. The fair value balance sheet, rather than being an anchorage for speculation about the future and its risk, becomes the embodiment of those risks.

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[16] For a proposal for revenue recognition that is consistent with the principles in this paper, see "Accounting for Revenues: A Framework for Standard Setting," *Accounting Horizons* 25 (2011), 577–592 by the American Accounting Association Financial Accounting Standards Committee (James Ohlson and Stephen Penman, principal authors).

[17] This is demonstrated in Penman, S., F. Reggiani, S. Richardson and İ. Tuna, "A Characteristic Model for Asset Pricing," unpublished paper, Columbia University, Bocconi University, and London Business School, 2013.

[18] See Penman, S. and F. Reggiani, "Returns to Buying Earnings and Book Value: Accounting for Growth and Risk," *Review of Accounting Studies* (December, 2013), forthcoming.

5. Conclusions and implications for research

This paper has presented a framework for evaluating normative accounting policy. It is rooted in expressions that connect accounting numbers to valuation and in normative principles under which the fundamental analyst works in evaluating investments. It is thus theoretically and practically based, designed to provide an accounting product that serves the user. We do not claim that the framework and the accounting principles that come from it to be definitive, but offer them as a benchmark against which other normative frameworks can be compared. We trust that we have been clear as to "where we are coming from," so that the reader can see the point at which he or she disagrees. We believe that our framework moves much quicker to accounting solutions than does the IASB and FASB conceptual framework project while, at the same time, is much closer to the accounting that a fundamental analyst desires.[19]

5.1. Implications for research

We close with some suggestions for future research in general, followed by some suggestions for future research with China considerations particularly in mind.

First and foremost, we encourage researchers to engage in normative accounting issues and research that gives rise to accounting solutions. That research should have its eye on the user: what accounting helps or hinders the user? It is helpful to see this research as similar to a medical researcher developing a new drug. He or she asks: what are the benefits and what are the side effects? This should be the approach to accounting issues.

Of course, there is considerable research already that can be characterized as investigating the product features of accounting. Research on earnings quality falls into this category, as does the research on the ability to manage earnings under IFRS and GAAP. We offer further suggestions. Many of these will require analytical modeling but most also lend themselves to empirical investigation.

- The ideas in this paper require more formal modeling. The revenue recognition principle is an important topic: why would an investor want the accounting for revenue to be transactions based? Why would an investor wish the deferral principle to be in place?
- The income statement approach works quite well with constant error in the balance sheet. But what accounting aids the investor when this condition does not hold? Would a mixed balance sheet and income statement approach (the "mixed model") help?
- There is considerable need to understand the appropriate accounting for forecasting. Does the income statement principle stated above lead to better forecasting? How does IFRS and GAAP accounting frustrate forecasting? Clearly, the balance sheet principle is also relevant, for much of the balance sheet becomes future expenses.
- How should the income statement be presented to enhance forecasting? Different income statement items have different implications for the future, so the forecasting perspective would suggest that items should be grouped according to this criterion. This accords with the analyst's desire for a measure of "sustainable income" or "core income," that is, income that projects the future versus "transitory income" of the present.
- What are the effects of fair value accounting in the balance sheet? In contrast to historical transactions accounting, fair value accounting puts the risk in the future into the balance sheet. So, what are the risks that an investor faces with a fair value balance sheet? Is risk better understood with a balance sheet based on historical transactions accounting?
- Does fair value accounting lose information by destroying information available in historical cost earnings? What is gained by fair value accounting?
- What are the properties and effects of fair value accounting for mortgages? What are the effects of the prospective method versus the incurred-loss method for estimated loan losses?

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[19] The book, Penman, S. *Accounting for Value* (New York: Columbia University Press, 2011) illustrates how accounting of the type envisioned here can be applied to active fundamental investing.

- What are effects on stock prices of accounting that leaves the investor subject to "hits" from a "soft" balance sheet, for example, from leaving operating leases or pensions off the balance sheet?
- How is historical transactions accounting implemented? How does the accountant go about matching costs to revenues in the income statement? Issues of product cost and period costs arise, as does absorption costing versus variable costing and accounting for (excess) capacity costs.
- Can the deferral principle for recognizing earnings under uncertainty be more explicit, perhaps by linking accounting to an asset pricing model for the expected return via Eq. (4)?
- What principle determines whether research and development (or just development) should be capitalized and amortized? How are amortization rates determined? Does the uncertainty about amortization rates mean that R&D expenditures should be expensed immediately (with amortization left to speculation by the analyst)? Does the deferral principle under uncertainty imply the immediate expensing of (risky) R&D expenditures?
- From an analyst's point of view, is the capitalization of brand-building expenditures (advertising and promotion) desirable? Again, do uncertain amortization rates (that induce imprecise matching) negate capitalization?
- How should the financial statements be designed to enhance analysis and, particularly, forecasting? This issue is pertinent to the IASB and FASB current project on financial statement presentation.

5.2. Implications for accounting research in China

Accounting in China operates in a much different environment than most developed economies. First, the current Chinese economy has evolved under a central-planning model, a process that started a bit more than 30 years ago. The legacy of central planning still permeates the Chinese economy. Second, most large enterprises, although partially privatized through share listing on stock exchanges, are still controlled by the state via majority equity ownership. The state government on one hand is the social administrator, and on the other hand is a controlling shareholder of these enterprises. When the objective as the social administrator differs from the objective of a controlling shareholder, agency problems arise within the government itself.[20] Non-state Chinese investors, in many cases in a minority position, have to deal with this peculiar agency problem (the *within-government agency problem*).

Accounting standards in China have evolved in the past 20 years out of the rigid and uniform Soviet accounting systems into the currently practiced International Financial Reporting Standards (IFRS). In most ways, the current Chinese Accounting Standards are congruent to International Accounting Standards in terms of objectives, concepts, recognition, and measurement. Accounting practice, however, may take longer to converge to international standards.[21]

Even though the accounting environment differs in China and official accounting standards have caught up with the international community only recently, we believe the role of accounting in society should not differ in any significant way in China. That is, accounting should provide investors with information to evaluate a firm and help investors allocate economic resources in an efficient way. Thus, we believe all the research questions that we raised earlier apply to China research. However, we also have some additional suggestions for China accounting research.

- How does the boundary of the firm differ in China with the presence of the within-government agency problem? That is, how does valuation change when the state controlling shareholder can tell the firm to conduct businesses in a way that fulfills social objectives that may harm firm value? What different or additional

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[20] Commentaries illustrate the problem: "Why China Works? A look at bright spots in the recession begins with Beijing, where state control is looking smart." *NewsWeek*, January 19, 2009.

[21] For more details of the convergence of Chinese accounting into International Accounting Standards, see Bing Xiang, 1998, "Institutional factors influencing China's accounting reforms", *Accounting Horizon* 12: 105–119; Charles Chen, Ferdinand Gul, and Xijia Su, 1999, "A comparison of reported earnings under Chinese GAAP vs. IAS: Evidence from the Shanghai Stock Exchanges", *Accounting Horizon* 13: 91–111; Shimin Chen, Zheng Sun, and Yuetang Wang, 2002, "Evidence from China on whether harmonized accounting standards harmonize accounting practices", *Accounting Horizon* 16: 183–197.

information might the investor require? What are the implications for the proprietorship concept of accounting – the equity focus – that is imbedded in much of our discussion above? Is an entity concept of accounting more appropriate in China? Could accounting be brought to the issue of how value is divided between the achievement of social goals and shareholder wealth?

- How can accounting be designed to evaluate the effects of related-party transactions when the state is a major shareholder of the reporting entity and many of its business counterparts?
- In addition to the operational uncertainty that firms in other economies also face, the within-government agency problem creates an additional layer of uncertainty for investors evaluating a firm in China. A large portion of the economic activity is organized through government planning, and government priorities change frequently and are difficult to predict. How can accounting and disclosure address this additional layer of uncertainty and aid investors in forecasting? Reducing uncertainty has the benefit of reducing the cost of capital, a benefit to the economy as a whole.
- China has adopted fair value accounting along with the IFRS. However, Chinese capital markets are renowned for their volatility. A volatile market price translates into volatile earnings and balance sheet. What are the consequences of fair value accounting in China? Is China a model of how mark-to-market accounting works (or does not work) for the investor?
- Institutional investors account for a relatively small portion in China's stock market and casual observations show that the stock prices are highly speculative. What accounting can anchor the large set of retail investors better?

The two sets of suggestions for accounting research are big questions and surely have to be refined to get traction. On most of them, we do not have the answer. There is much need for further investigation such that accounting principles are established, not from conjecture, but as a product of sound research. The result will be concrete solutions for practice and an elevation of the status of accounting academics as having made a "contribution." All important is the thinking behind the research. We hope we have added to that thinking with this paper.

IAS/IFRS and financial reporting quality: Lessons from the European experience[☆]

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ABSTRACT

This paper discusses the effects of the adoption of IAS/IFRS in Europe on the quality of financial reporting. In doing so, it adopts the perspective of stock market investors and focuses on value-relevance research. The adoption of IAS/IFRS in Europe is an example of accounting standardization among countries with different institutional frameworks and enforcement rules. This allows investigating whether, and to what extent, accounting regulation *per se* can affect the quality of financial reporting and leads to convergence in financial reporting. This is a key issue for standard setting purposes as IAS/IFRS have been adopted in very diverse countries all over the world, and many others are likely to adopt them in the near future.

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1. Introduction

Standard setters, regulators, and policy-makers all have a vital interest in the effect of financial reporting on the economy. This interest is due to the economic consequences associated with financial information.

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Financial information influences investors' behavior with respect to portfolio selection, which in turn affects security prices and, therefore, the terms on which a firm obtains additional financing.

Empirical research has shown the importance of markets that work well for efficient capital allocation (Wurgler, 2000). When the market works well, pricing of securities is correct, the allocation of capital in the economy is efficient, and everyone is better off.

Financial reporting regulation is one of the mechanisms used to promote the operation of securities markets. Just as a used car dealer who develops a reputation for honesty and fair dealing will enjoy higher sales prices, a firm with a credible policy of high quality information is expected to enjoy higher share prices and a lower cost of capital. This is because high quality disclosure reduces investors' concerns about inside information.

The purpose of this paper is to identify, consider, evaluate, and comment on existing research on the effects of the adoption of IAS/IFRS on the quality of financial reporting. In doing so, this paper adopts the perspective of stock market investors and focuses on value-relevance research. Moreover, it focuses on the European experience. Starting from 2005, the European Regulation 1606/2002 has mandated the adoption of IAS/IFRS in all the member states of the European Union with the ultimate goal of increasing transparency in financial reporting. IAS/IFRS adoption in the European Union therefore represents an extraordinary event for empirical research on the quality of financial reporting for two main reasons. First of all, IAS/IFRS adoption in the European Union has been mandatory. Secondly, it has involved different countries with different accounting standards.

To date, there is no exhaustive literary review examining the effects of the mandatory adoption of IAS/IFRS in the European Union. Soderstrom and Sun (2007), for instance, concentrate on voluntary IAS/IFRS adoption and on the stock market perception of announcements related to IAS/IFRS adoption in the European Union. Their analysis has yielded important results, which highlight that accounting quality is a function of the firm's overall institutional setting, including the legal and political system of the country where the firm resides. However, findings on voluntary IAS/IFRS adoption cannot be generalized in the case of mandatory IAS/IFRS adoption. This is because voluntary adopters self-select to follow IAS/IFRS after considering the related costs and benefits, with the transparency of information being only one of them. On the contrary, mandatory adopters in the European Union switched to IAS/IFRS because this was required by Regulation 1606/2002.

Pope and McLeay (2011), instead, report evidence on the effects of mandatory IAS/IFRS adoption in the European Union, but their work is limited to the 2007–2010 period, and with a specific focus on findings from the European Commission-funded INTACCT project.[1] In line with Soderstrom and Sun, Pope and McLeay document that the effects of mandatory IAS/IFRS adoption largely depend on preparer incentives and local enforcement.[2]

Brüggemann et al. (2012) also provide a review on the mandatory adoption of IAS/IFRS in the European Union, which considers a wide range of effects, ranging from compliance and accounting choices in implementing IAS/IFRS to capital markets and macroeconomic consequences. However, whether or not IAS/IFRS improve the quality of financial reporting has not been completely addressed with specific regard to their mandatory adoption in Europe.

Academic research is an important tool for standard setters and policymakers as it can provide evidence helpful to informing the debate and the decision-making process on financial reporting issues. The purpose of this review is therefore to present a comprehensive overview of accounting studies investigating the effect of mandatory IAS/IFRS adoption on accounting quality, to assist accounting researchers and all the participants in the financial reporting process. In doing so, this paper focuses on value-relevance studies, which investigate the usefulness of accounting information to equity market investors.

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[1] INTACCT was a research network among European Universities supported by the European Commission over the period 2007–2010. Its purpose was to conduct research on IAS/IFRS compliance and enforcement as well as on the accounting and real economic consequences of IAS/IFRS adoption in the European Union.

[2] Enforcement is defined by the Committee of European Securities Regulation as the combination of supervision and sanctioning in cases of non compliance with the rules (Ball et al., 2003).

This paper extends prior literature in different ways. First of all, it complements previous reviews on the effects of IAS/IFRS adoption by examining a wider range of recent studies on the value-relevance of IAS/IFRS for European firms. By focusing on the European context, this review also helps policy-makers assess whether the European Regulation 1606/2002 has effectively achieved its objective of improving the quality of financial reporting. According to such a Regulation, the goal of adopting IAS/IFRS in the European Union is in fact to ensure a higher level of transparency of information which, in turn, should lead to a more effective and efficient functioning of capital markets.

Finally, IAS/IFRS adoption in the European Union is an example of accounting standardization among countries having different institutional frameworks and enforcement rules. As a result, this literary review allows inference on whether, and to what extent, accounting regulation *per se* can affect the quality of financial reporting. As will be seen, empirical findings show that the quality of IAS/IFRS implementation and the economic consequences of their adoption depend on enforcement mechanisms and institutional factors, which are far from uniform across Europe.

This is a key issue given the widespread acceptance of IAS/IFRS all over the world. IAS/IFRS or local variants have been adopted in jurisdictions as diverse as Australia, Canada, Hong Kong, Central and Eastern Europe, including Russia, parts of the Middle East and Africa. India, Japan, and much of South America are in the process of discussing and deciding upon mandatory adoption of IAS/IFRS, at least for part of their economies. Several other countries have not adopted IAS/IFRS, but have established convergence projects.[3] Moreover, in 2007, the Securities and Exchange Commission (SEC) in the United States of America eliminated the reconciliation from IAS/IFRS to US GAAP required by foreign companies listed on US markets. The SEC also announced that IAS/IFRS would be permitted in US markets as an alternative to US GAAP, although in this case, the timescale is lengthy and subject to various conditions. The details vary, but the trend toward IAS/IFRS as a single set of globally accepted accounting standards is therefore clear and strong.

In order to identify relevant studies for this literature review, I have selected the following key words: IAS/IFRS adoption, value-relevance, accounting quality, capital market research, and Regulation 1606/2002. These search terms were used in editorial databases, such as Elsevier, Springer, Taylor and Francis, and Wiley, as well as in the Social Science Research Network (SSRN), JSTOR and Business Premiere databases. Moreover, the list of references in the papers identified through the abovementioned databases has been used to identify additional papers relevant to this review.

The paper is organized as follows: Section 2 defines accounting quality and describes how it is measured by value-relevance studies. Section 3 describes the main differences between European domestic GAAP and IAS/IFRS. Section 4 provides an analysis of the effects of adopting IAS/IFRS in Europe on the quality of financial reporting, whereas Section 5 concludes with specific guidance for future accounting research and the policy-making debate.

2. Financial reporting quality: definition and empirical measure in value-relevance research

This paper reviews empirical research on the mandatory adoption of IAS/IFRS in Europe by adopting the perspective of stock market investors and therefore focusing on value-relevance research. This choice is consistent with both the IASB Framework and the European Regulation 1606/2002 mandating IAS/IFRS in the European Union.

According to IASB (2010), the two primary qualitative characteristics of information in financial statements are relevance and faithful representation. Information in financial statements is relevant when it is capable of making a difference to a financial statement user's decisions. Relevant information has confirmatory or predictive value. Faithful representation means that the information reflects the real-world economic phenomena that it purports to represent. Relevance and faithful representation make financial statements useful to the reader. There are also some enhancing qualitative characteristics, which are complementary to the fundamental characteristics: comparability, verifiability, timeliness, and understandability. Enhancing

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[3] For instance, since 2007 China requires all listed companies to report under a new set of Chinese Accounting Standards which is recognized by the IASB as having achieved substantial convergence with IAS/IFRS.

qualitative characteristics distinguish more useful information from less useful information. They enhance the decision-usefulness of financial reporting information that is relevant and faithfully represented.

Usefulness of financial reporting underlies the all IASB's conceptual framework. IASB (2010 BC 1.16) states that the main objective of financial reporting is to provide information that is useful to investors, creditors, and others in making investment, credit, and similar resource allocation decisions. However, although financial reporting users include a large numbers of subjects, IASB focuses on the needs of participants in capital markets. More specifically, investors are considered those who are most in need of information from financial reports, given that they cannot usually request information directly from the firm. Moreover, as investors provide risk capital to firms, the financial statements which meet their needs also meet most of the needs of other users. Investors' needs are therefore considered as highly representative of the needs of a wide range of users (IASB 2010 BC 1.16). As a result, in the last decades, empirical research has long been focusing on the relationship between different accounting standards and share prices, or returns, with the purpose of identifying the best accounting policies.

The research stream that compares different accounting standards by examining their association with securities prices is also called "value-relevance" research (Holthausen and Watts, 2001). As outlined by Barth et al. (2001), in the accounting literature, an accounting number is defined as value-relevant if it has a predicted association with share prices. This, in turn, happens only if the amount reflects information relevant to investors in valuing a firm and is measured reliably enough to be reflected in share prices. Equity values therefore reflect an accounting amount only if the two are correlated. Moreover, value-relevance research interprets accounting amounts that are more value-relevant as being of higher quality (Barth et al., 2008).

Of course, there are a variety of other ways that researchers can operationalize relevance and reliability, or the secondary dimensions of these primary criteria that standard setters consider when making standard setting decisions. For instance, some research investigates accounting quality by focusing on earnings management or timely loss recognition (e.g. Leuz et al., 2003; Burgstahler et al., 2006; Barth et al., 2008). However, in large part because of the development of the notion of market efficiency (Fama, 1970), value-relevance studies have been dominant.

A value-relevance approach in examining the effects of the mandatory adoption of IAS/IFRS in Europe also finds support in the European Regulation 1606/2002. Such regulation states that "*in order to contribute to a better functioning of the internal market, publicly traded companies must be required to apply a single set of high quality international accounting standards*" (….) *For the purpose of this Regulation,* "*international accounting standards' shall mean International Accounting Standards (IAS), International Financial Reporting Standards (IFRS) (…..) adopted by the International Accounting Standards Board.*" Along the same lines, the IFRS Foundation states that IAS/IFRS are aimed at insuring that firms publish high quality reports (IFRS Foundation, 2010). IAS/IFRS are therefore considered to be of higher quality than domestic GAAP, an issue into which value-relevance research can provide useful insight. Furthermore, the ultimate goal of Regulation 1606/2002 adopting IAS/IFRS is "*to improve the efficient and effective functioning of capital markets,*" which is consistent with the focus of value-relevance research on the needs of capital market investors.

Holthausen and Watts (2001) categorize value-relevance studies into relative association tests, incremental association tests, and marginal information content studies. Relative association tests compare the association between stock market values (or returns) and accounting numbers prepared according to different accounting standard sets. Accounting numbers with a greater R^2 are described as being more value-relevant. Value-relevance studies normally focus on the book value of equity and net income as they are key drivers in firm valuation (Feltham and Ohlson, 1995, 1996; Ohlson, 1999, 2000). Incremental association tests investigate whether accounting numbers are helpful in explaining stock market values (or returns) given other specified variables. An accounting number is typically deemed to be value-relevant if its estimated regression coefficient is significantly different from zero. Incremental association tests are usually used to test the reconciliation adjustments from one accounting standard set to another. Finally, marginal information content studies investigate whether a particular accounting number adds to the information set available to investors. They typically use event studies to determine whether the release of an accounting number (conditional on other information released) is associated with value changes. Price reactions are considered evidence of value-relevance.

Table 1
Value-relevance studies on IAS/IFRS adoption in Europe.

Paper	Adoption mode	Single/multi-country setting	Sample	Period	Accounting Measures	Type of value-relevance study	Model	IAS/IFRS effect
Aharony et al. (2010)	Mandatory	Multi	14 European Countries	2004–2006	Book value of equity, earnings, goodwill, research and development expenses, revaluation of property, plant and equipment (per share)	Relative and incremental association tests	Price and return regressions	Positive
Aubert and Grudnitski (2011)	Mandatory	Multi	15 European Countries	2004–2005	Earnings per share	Incremental association test	Return regression with a dummy variable for accounting standards	None
Agostino et al. (2011)	Mandatory	Multi	15 European Countries	2000–2006	Book value of equity and earnings per share	Incremental association test	Price regression with a dummy variable for accounting standards	Mainly positive
Barth et al. (2008)	Voluntary	Multi	Worldwide (13 European Countries)	1994–2003	Book value of equity and earnings per share	Relative association test	Price regression and reverse regression of earnings on share price	Positive
Bartov et al. (2005)	Voluntary	Single	Germany	1998–2000	Earnings (deflated by the market value of equity at the beginning of the year)	Incremental association test	Return regression with a dummy variable for accounting standards	Positive
Callao et al. (2007)	Mandatory	Single	Spain	2004 (interim reconciled statements)	Book value of equity	Relative association test	Comparison of differences in the book-to-market ratio before and after IAS/IFRS adoption	None
Clarkson et al. (2011)	Mandatory	Multi	13 European Countries and Australia	First time adoption from 2005 onwards (reconciled statements)	Book value of equity and earnings (per share)	Relative association test	Nonlinear price regression	None
Devalle et al. (2010)	Mandatory	Multi	5 European Union countries	2002–2007	Book value of equity and earnings (per share)	Relative association test	Price and return regressions	Mixed evidence

Table 1 (continued)

Paper	Adoption mode	Single/multi-country setting	Sample	Period	Accounting Measures	Type of value-relevance study	Model	IAS/IFRS effect
Gjerde et al. (2008)	Mandatory	Single	Norway	2005 (reconciled statements)	Book Value of equity, earnings, operating revenue, operating costs, net financial costs, net unusual income (per share)	Relative and incremental association tests and marginal information content studies	Price, return and abnormal return regressions	Mixed evidence
Horton and Serafeim (2010)	Mandatory	Single	UK	2005 (reconciled statements)	Book value of equity and earnings (per share)	Incremental association test and marginal information content study	Price and abnormal return regressions	Mainly positive
Hung and Subramanyam (2007)	Voluntary	Single	Germany	1998–2002	Book value of equity and earnings	Relative and incremental association tests	Market value of equity regression	None
Iatridis and Rouvolis (2010)	Both voluntary and mandatory	Single	Greece	2004–2006	Book value of equity and earnings (per share)	Relative association test	Price and return regressions, and reverse regression of earnings on stock prices	Positive
Jarva and Lantto (2012)	Mandatory	Single	Finland	2005 (reconciled statements)	Book value of assets, book value of liabilities and earnings	Relative and incremental association tests	Market value of equity regression (All variables are deflated by market capitalization)	None
Jermacowicz et al. (2007)	Voluntary	Single	Germany	1995–2004	Book value of equity and earnings	Relative association test	Market value of equity regression (All variables are deflated by market value of equity at the beginning of the period)	Positive
Karampinis and Hevas (2011)	Mandatory	Single	Greece	2002–2007	Book value of equity and earnings, accruals and cash flow from operations (per share in price regression, deflated by market value of equity in return regression)	Relative association test	Price and Return regressions	Minor improvements

Study	Type	Sample	Country	Period	Variables	Method	Model	Result
Morais and Curto (2008)	Mandatory	Single	Portugal	1995–2005	Book value of equity and earnings (per share)	Relative association test	Price regression	Negative
Morais and Curto (2009)	Mandatory	Multi	14 European Union Countries	2000–2005	Book value of equity and earnings (per share)	Relative association test	Price regression (All variables are deflated by the book value of equity)	Positive
Paananen and Lin (2009)	Both voluntary and mandatory	Single	German	2000–2006	Book value of equity and earnings (per share)	Relative association test	Price regression and reverse regression of earnings on price (All variables are scaled by share price 6 months after the preceding year-end)	Negative
Prather-Kinsey et al. (2008)	Mandatory	Multi	16 European Countries	2004–2006	Book value of equity and earnings	Relative association test and marginal information content study	Market price regression (All variables are deflated by market value of equity at the beginning of the year)	Positive

Table 1 provides a list of the value-relevance studies on IAS/IFRS adoption in Europe, summarizing for each of them: the adoption mode (mandatory or voluntary); the research setting (single or multi-countries); the sample, the time period and the accounting measures under investigation; the type of value-relevance test (relative or incremental test, or marginal information content study); the empirical specification of the models; and their findings on the effects of IAS/IFRS adoption.

3. Main differences between european domestic gaap and IAS/IFRS

Regulation 1606/2002 requires that, for each financial year starting on or after January 1, 2005, companies governed by the law of a member state prepare their consolidated accounts in conformity with IAS/IFRS if, on their balance sheet date, their securities are admitted to trading on a regulated market of any member state. The Regulator has also provided an option for member states to permit or require the application of international accounting standards in the preparation of annual accounts and to permit or require their application by unlisted companies.

Prior regulation for listed companies in Europe was based on the fourth and seventh European Directives. The objective of the Directives was to harmonize financial disclosure, that is, to reduce the number of differences in accounting standards across the European Union member states. However, the Directives did not require that the same rules be applied in all member states, but that the prevailing rules were compatible with those in other member states. Given this flexibility, the implementation of the accounting Directives has differed from country to country.

Domestic GAAP based on such directives are still in use in Europe for those firms and annual accounts that are not permitted or required to adopt IAS/IFRS.

According to Regulation 1606/2002, the fourth and seventh European Directives could not ensure a high level of transparency in financial reporting, which is a necessary condition for building an integrated capital market that operates effectively and efficiently. This implies that requiring IAS/IFRS for listed companies is expected to improve the quality of financial reporting.

The former chairman of IASB, Mr. Tweedie, explains the reasons underlying the switch from the European Directives to the IAS/IFRS as follows: "*For too long, earnings have been smoothed in an effort to show investors a steady upward trajectory of profits. While this approach provides a simple and understandable model, it simply is not consistent with reality. Publicly traded companies are complex entities, engaged in a wide range of activities and subject to different market pressures and fluctuations. Accounting should reflect these fluctuations and risks (. . .) The current direction we are taking will be what I like to call, 'tell it like it is' accounting. This means an increasing reliance on fair values, when these values can be determined accurately.*"

As a matter of fact, the European Directives are more concerned with the protection of debt holders and mandate more conservative accounting methods. Under the Directives, prudence prevails over accrual, and historical cost is the basic criterion for financial reporting, whereas IAS/IFRS are more focused on equity investors and conceive financial reporting in a more dynamic way. They make large use of fair value accounting and require a fuller disclosure than the European Directives.

Compared to the legalistic and politically and tax-influenced standards that have historically typified accounting in Europe, IAS/IFRS reflect more economic substance than legal form; they make economic gains and losses more timely, and curtail managers' discretion in setting provisions, creating hidden reserves and smoothing earnings. IAS/IFRS require the entire liability to be on the balance sheet, all companies controlled, even when they carry out different activities, to be fitted within the consolidated area and to be consolidated line by line, and they require assets to be written at their fair value when this value can be determined accurately.

In particular, fair value accounting is expected to provide investors with useful information to predict the capacity of firms to generate cash flow from the existing resource base. Fair value should therefore play a key role in reducing the information asymmetry between firms and investors, thus improving the quality of information. By adopting fair value accounting, the concept of income changes from income produced to mixed income, which also includes potential revenues. The concept of net capital is divested of its strictly juridical connotation and takes a more economic meaning. In fact, the introduction of fair value makes net capital converge toward its market value.

Fuller accounting policies and explanatory notes are also expected to play a key role in reducing information asymmetries and improving firm value. For instance, IAS 36 "*Impairment of assets*" includes, among the information to be provided for each class of assets, the amount of impairment losses recognized or reversed, the recoverable amounts, the values in use and the discounting rate used in their estimation. In any case, financial statement users have to be provided with information concerning the evaluation models being used, which are otherwise handled within the company and kept strictly confidential. IAS 37 "*Provisions, Contingent Liabilities and Contingent Assets*" requires detailed information about contingent liabilities such as the estimation of their financial effects as well as the uncertainties about the amount or timing of the resulting outflows. The disclosure required by IFRS 7 "*Financial instruments: disclosures*" with regard to financial instruments appears to be even more detailed. It consists of a considerable supply of information, ranging from basic issues such as the amount, the nature, and general conditions of each financial instrument, to information on fair value and on risk management policies, especially with regard to interest rate and credit risk. IAS 14 "*Segment reporting*" establishes principles for reporting financial information by segment, that is, information about the different types of products and services, a firm produces and the different areas in which it operates. As stated by IAS 14, the explicit objectives of such detailed information are "*to help users of financial statements to better understand the firm's past performance, to better assess its risk and returns and make more informed judgments about the firm as a whole*" (IAS 14). As a consequence, with IAS/IFRS adoption, part of the information previously used exclusively for management control purposes is now given to the market in order to improve the quality of public information.

4. The effects of IAS/IFRS adoption on financial reporting quality

4.1. Research on IAS/IFRS adoption prior to the European Regulation 1606/2002

Several studies have investigated the effects of adopting IAS/IFRS in Europe on investors' perception of accounting quality already prior to Regulation 1606/2002, providing evidence in favor of their adoption.

By means of disclosure quality scores provided by reputed experts, Daske and Gebhardt (2006) report, for instance, an increase in accounting quality for a sample of Austrian, German, and Swiss firms switching to IAS/IFRS in the period prior to their mandatory adoption in Europe. Similar results are provided by value-relevance studies such as the ones by Bartov et al. (2005) and Jermacowicz et al. (2007), which document an increase in the value-relevance of earnings for German firms adopting IAS/IFRS. Barth et al. (2008) also compare domestic GAAP and IAS/IFRS across 21 countries, suggesting that firms applying IAS/IFRS exhibit less earnings management, more timely loss recognition, and more value-relevant accounting measures.

However, all these studies refer to voluntary adoption of IAS/IFRS, which might be the result of corporate incentives to increase transparency. Ashbaugh (2001), for instance, documents that the decision to report under IAS/IFRS is positively related to corporate size, the number of foreign equity markets on which the firm's shares are traded and the additional issuance of equity shares. Similar findings are reported by Cuijpers and Buijink (2005) and Gassen and Selhorn (2006). For a sample of European non-financial firms voluntarily adopting IAS/IFRS, Cuijpers and Buijink (2005) document that foreign listing and geographical dispersion of operations are important drivers. Gassen and Selhorn (2006) also show that size, international exposure, dispersion of ownership, and IPOs are important determinants of voluntary IAS/IFRS adoption by publicly traded German firms. Findings therefore suggest that companies voluntarily shifting to IAS/IFRS have incentives to improve transparency and the quality of financial reporting. Along the same lines, Covrig et al. (2007) document that foreign mutual fund ownership is significantly higher among IAS/IFRS adopters, which suggests a voluntary switch to IAS/IFRS aimed at attracting foreign investors by providing them with both more information and information that is more familiar to them.

Self-selection bias could also explain mixed results in research, such as in the case of Hung and Subramanyam (2007), who fail to find – as opposed to Bartov et al. (2005) and Jermacowicz et al. (2007) – significant differences in the value-relevance of accounting numbers under domestic GAAP or IAS/IFRS for their selected sample of German firms.

Since the same incentives are not likely to be found when IAS/IFRS adoption is mandatory, results referring to voluntary shifts may not extend to mandatory adoption cases. Christensen et al. (2008), for instance,

provide evidence consistent with this view. They investigate voluntary and mandatory shifts to IAS/IFRS in Germany, where firms were allowed to switch to IAS/IFRS prior to 2005 and find that voluntary adoption is associated with an increase in accounting quality, measured by earnings management and timely loss recognition, whereas such an improvement is not observed in the case of mandatory shifts. Their findings therefore suggest that high quality accounting standards such as IAS/IFRS do not necessarily lead to higher quality accounting, at least when firms do not perceive net benefits from IAS/IFRS adoption. This evidence is in line with Daske et al. (2013) who also find that changes in firms' reporting incentives play a significant role in the commitment to increased disclosure for firms voluntarily adopting IAS/IFRS. As firms have considerable discretion in how they implement the new standards, some of them can make very few changes and adopt IAS/IFRS more in name than as a strategy to increase their commitment to transparency (Daske et al., 2013).

4.2. Research on mandatory IAS/IFRS adoption in the European Union

The adoption of IAS/IFRS required by European Regulation 1606/2002 for all listed companies in the European Union represented an extraordinary event for empirical research, as it became possible to investigate the effects of financial reporting under IAS/IFRS with specific regard to mandatory adoption at a European level.

Early evidence documents that equity investors already perceived the benefits of IAS/IFRS adoption before the enforcement of Regulation 1606/2002. Comprix et al. (2003), for instance, identify 11 dates between 2000 and 2002 that signal the likelihood or the timing of the IAS/IFRS adoption in the European Union and find that the stock market reacted positively to news that increased the probability of IAS/IFRS adoption. Armstrong et al. (2010) also investigate the European stock market reactions to 16 events associated with the adoption of IAS/IFRS in Europe, such as the European Parliament Resolution requiring all EU listed companies to use IAS/IFRS, or the endorsement of all IAS/IFRS except for IAS 32 and 39, or the IAS 39 endorsement with carved out provisions. They find that the stock market reaction was significantly positive (negative) in reaction to events that increased (decreased) the likelihood of the adoption and that the reaction was stronger for firms that did not cross-list in the United States. In contrast to the 3-day window test in Armstrong et al., Pae et al. (2008) focus on the reduction of Tobin's Q associated with agency costs in a long-window test over the period when the European Union moved to IAS/IFRS. They find that from 1999 to 2003, Tobin's Q increased more for European firms that were not listed in the United States, were family-controlled, and had low analyst following. Pae et al. attribute these findings to the announcements of IAS/IFRS adoption in the European Union, which led to expectations of reduced future agency costs.

A certain number of value-relevance studies have investigated the effects of mandatorily adopting IAS/IFRS by focusing on different European countries contemporarily. Aubert and Grudnitski (2011), for instance, examine 13 countries in the European Union and 20 industries at the same time, but fail to document a statistically significant increase in the value-relevance of accounting information after IFRS adoption. Devalle et al. (2010) focus on companies listed on five European stock exchanges – Frankfurt, Madrid, Paris, London, and Milan – and find mixed evidence: the value-relevance of earnings on share price increased following the introduction of IFRS in Germany, France, and the United Kingdom, while the value-relevance of book value decreased, except for the United Kingdom. Agostino et al. (2011), instead, report positive effects of IAS/IFRS adoption on the value-relevance of accounting data for a sample of European banks.

Some value-relevance studies have investigated the mandatory IAS/IFRS adoption in individual countries, with the important advantage of reducing the problem of omitted variables. In fact, examining an individual country limits possible confounding effects due to a wide range of country-related factors which might affect the value-relevance of accounting numbers. Nevertheless, studies on individual countries have also provided controversial results: some of them have found that IAS/IFRS are more value-relevant than domestic GAAP, others found them to be otherwise, and still, others did not find any significant difference between IAS/IFRS and domestic GAAP.

Callao et al. (2007), for instance, do not find that the value-relevance of financial reporting improved for a sample of Spanish firms, whereas comparability even worsened after IAS/IFRS implementation. Similar results are provided by Morais and Curto (2008), who report a negative impact of IAS/IFRS adoption on

the value-relevance of accounting numbers for a sample of Portuguese firms, and by Paananen and Lin (2009) for a sample of German firms. Jarva and Lantto (2012) also fail to find systematic evidence that mandatory IFRS adoption resulted in improved accounting quality for a sample of Finnish firms. Finland is particularly well suited for assessing IAS/IFRS usefulness as it already had a high quality reporting environment, although domestic standards differed significantly from IFRS. Gjerde et al. (2008), instead, find mixed results for firms listed on the Oslo Stock Exchange. Their analysis provides little evidence of increased value-relevance for IAS/ IFRS numbers when comparing and evaluating the two accounting sets unconditionally. When evaluating the change in accounting figures, the reconciliation adjustments to IAS/IFRS are found, instead, to be marginally value-relevant.

In contrast, some research has provided evidence of the beneficial effects of adopting IAS/IFRS. Horton and Serafeim (2010), for instance, find that reconciliation amounts to IAS/IFRS are value-relevant for a set of English firms. Iatridis and Rouvolis (2010) also document that IFRS-based financial statement measures have higher value-relevance than those prepared under Greek GAAP, whereas Karampinis and Hevas (2011) report some small, although positive effects of IAS/IFRS adoption on the value-relevance of accounting income.

Several studies have tried to find out the reasons for such mixed results. Some of them have highlighted the important role of methodological issues. One of these relates to the omitted variable problem. For instance, Bartov et al. (2005) use a regression of returns on earnings, in which book value could be the omitted variable that is correlated with earnings, thus biasing the coefficient on earnings.

Barth and Clinch (2009) have highlighted the important role of model specification. Based on simulated data, Barth and Clinch (2009) show that the undeflated and share-deflated specifications of the Ohlson model perform better than the equity market-to-book ratio, price-to-lagged price, returns and equity market value-to-market value ratio specifications. The undeflated and share-deflated specifications consistently result in correct inferences relating to whether the coefficients equal zero and in lower bias and mean absolute errors in the coefficients and regression R^2.

Finally, some studies have pointed out that regression models used to compare different accounting standards (e.g., before and after IAS/IFRS adoption) may be mis-specified because the relationship between prices and accounting measures is not linear. Ashbaugh and Olsson (2002) provide consistent evidence by showing that the violation of clean surplus accounting makes regressions based on the Ohlson model (1995) mis-specified. Clarkson et al. (2011) also document increased nonlinearity in the relationship between share prices and accounting data subsequent to IFRS adoption, which alters statistical inference based on a traditional linear pricing model.

Some other studies have instead shown the major role played by enforcement regimes and firms' reporting incentives for capital market benefits from IAS/IFRS adoption. Daske et al. (2008), for instance, document modest but economically significant capital market benefits around IAS/IFRS mandatory adoption. However, such market benefits occurred only in countries where firms had incentives to be transparent and where legal enforcement was strong. In addition, the capital market effects of IAS/IFRS adoption were larger for firms in countries with domestic standards of lower quality and differing more from IAS/IFRS. Daske et al. (2013) also show the important role of reporting incentives around mandatory IAS/IFRS adoption in determining whether firms resist changing their reporting practices.

Although in the context of voluntary adoption, Barth et al. (2008) suggest that, even if IAS/IFRS are higher quality standards, the effects of features of the financial reporting system other than the standards themselves, including enforcement and litigation, can eliminate any improvement in accounting quality arising from IAS/ IFRS adoption.

Among value-relevance studies, Prather-Kinsey et al. (2008) provide evidence on the heterogeneity in the capital market consequences of mandatorily adopting IAS/IFRS by showing that firms from code law countries experienced more significant market benefits from implementing IFRS than firms from common law countries. For a sample of European firms from 14 different countries, *Morais and Curto (2009)* document that the value-relevance of financial information increased after IAS/IFRS adoption, although to a different degree according to specific factors in the country in which the companies were based. In particular, they document that the relationship between tax and accounting influences the value-relevance of accounting information, with value-relevance being higher for countries where accounting and tax are less aligned. Finally,

Aharony et al. (2010) focus on three accounting information items for which measurements under IAS/IFRS are likely to differ considerably from measurements under domestic GAAP: goodwill, research and development expenses (R&D), and asset revaluation. By using valuation models that include these three variables in addition to book value of equity and earnings, Aharony et al. show that adopting IAS/IFRS increases their value-relevance to investors. However, findings also provide additional evidence of cross-country differences in the incremental value-relevance of IAS/IFRS, with investors benefitting most from the implementation of IAS/IFRS for such items in the European Union countries where local standards deviated more from IAS/IFRS.

These results are in line with Kvaal and Nobes (2010), who find significant evidence that pre-IAS/IFRS national practices continue where this is allowed within IAS/IFRS, thus documenting the existence of national patterns of accounting within IAS/IFRS.

Taken as a whole, empirical evidence suggests that if, on the one hand, there are arguments to support an improvement in accounting quality under IAS/IFRS, on the other hand, there are also reasons to think that mandatory adoption by itself is not sufficient to increase the quality of financial reporting. Accounting quality is not only the result of the quality of accounting standards, but also the result of the countries' legal and political systems as well as financial reporting incentives.

This conclusion also finds support in the research stream that investigates the role of legal and political frameworks in shaping financial information and investor protection. Cairns (1999) and Street and Gray (2001), for instance, provide early evidence that lax enforcement results in limited compliance with IAS, thereby limiting their effectiveness. La Porta et al. (1998, 2000, 2002, 2006), Francis and Wang (2008) as well as Ball et al. (2003) also suggest that adopting high quality standards might be a necessary condition for having high quality information, without being a sufficient one. Ding et al. (2007) document that simply adopting IAS/IFRS may not necessarily improve national accounting systems unless countries implement profound changes in economic development policy, corporate governance mechanisms, and financial market functioning in general.

Along the same lines, Ball (2006) provides a list of important dimensions in which the world still looks considerably more local than global, with the important effect of making IAS/IFRS adoption uneven. Some of these relate to political, legal, and enforcement systems, some others are due to different historical and cultural backgrounds, and still, others are the result of some, or all these factors. Local dimensions include, for instance, the extent and nature of government involvement in the economy; government involvement in financial reporting practices such as the political influence of managers, corporations, labor unions and banks; legal systems such as common law versus code law and shareholder litigation rules; securities regulation and regulatory bodies; the structure of corporate governance such as relative roles of labor, management and capital; the extent of private versus public ownership of corporations, of family-controlled businesses and of corporate membership in related company groups; the extent of financial intermediation; the role of small shareholders versus institutions and corporate insiders; the use of financial statement information, including earnings, in management compensation; the status, independence, training and compensation of auditors. The above list is far from complete, but it gives some sense of the fact that the primary driving forces behind the majority of actual accounting practices are domestic. As a result, cross-country differences in accounting quality are likely to remain after IAS/IFRS unless institutional differences are also removed.

Research examining other dimension of accounting quality has also come to the same conclusions. Leuz et al. (2003), for instance, document that countries with stronger investor protection enact and enforce accounting and securities standards in a way that reduces earnings management. Burgstahler et al. (2006) also report that strong legal systems are associated with less earnings management. Likewise, Cai et al. (2008) indicate that countries with stronger enforcement mechanisms generally have less earnings management after IAS/IFRS adoption. Additionally, IAS/IFRS adoption in countries with weak enforcement mechanisms damages their perceived quality of IAS/IFRS, whereas strong IAS/IFRS enforcement regimes put great pressure on management and auditors to act faithfully and truthfully to comply with the standards (Sunder, 1997). Evidence therefore suggests that changes in accounting standards can play a role, but only coupled with proper reporting incentives and legal enforcement.

5. Conclusions

This paper discusses extant empirical research on the effects of IAS/IFRS adoption on financial reporting quality. It adopts a value-relevance perspective and focuses on the European experience, where IAS/IFRS have been mandated for consolidated financial statements of listed companies starting from 2005.

This literary review yields two main findings: First, viewed together, empirical evidence suggests some beneficial effects from the mandatory adoption of IAS/IFRS in Europe. In fact, empirical studies provide some support to the notion that adopting IAS/IFRS improves the quality of financial reporting, thereby increasing its usefulness to investors. The second main finding is that these effects differ according to the institutional setting of firms adopting IAS/IFRS. Factors different from accounting regulation play a key role in determining financial reporting quality and have actually led to an application of IAS/IFRS, which is not uniform across Europe, with consequences on accounting quality both in absolute and relative terms. Empirical findings suggest that cross-country differences in accounting are also likely to remain after IAS/IFRS adoption.

This paper also shows that academic research is a valuable resource which can help standard setters and policymakers better understand the possible effects of accounting standards. Accounting research cannot answer the question: what should the standard be? Rather, research aids in identifying issues, helps standard setters structure their thinking about such issues and provide evidence that can inform the debate.

According to this view, this paper concludes by providing some guidance for future research and the policymaking debate.

First of all, this paper argues that, while empirical evidence on the role of institutional settings and firms' incentives in shaping accounting quality is quite compelling, some caution must be shown in drawing definite conclusions on the effects of mandatory IAS/IFRS adoption on financial reporting quality. Although the literature on mandatory IAS/IFRS adoption in Europe has developed rapidly over the past years, it is still immature. In fact, extant research generally covers the period immediately subsequent to IAS/IFRS adoption in Europe, whereas it leaves the recent financial crisis out.

One of the mechanisms through which IAS/IFRS are expected to affect the quality of financial reporting is fair value accounting. Fair value accounting is supposed to ensure a higher degree of transparency in financial statements, which should lead to a higher value-relevance of accounting data and a better capability of financial markets to reflect the actual value of a firm. However, critics argue that fair value accounting based on models is not reliable, therefore raising some doubts regarding its usefulness to investors (Penman, 2007; Benston, 2008; Kolev, 2009; Goh et al., 2009; Palea and Maino, in press).

The value-relevance of financial reporting under IAS/IFRS in Europe during the recent economic crisis and its specific link to fair value accounting is a key issue, especially with respect to the banking sector, which has not yet been investigated completely. Many papers have discussed the role of fair value accounting in the financial crisis (e.g. Bank for International Settlements, 2009; Novoa et al., 2009; Laux and Leuz, 2009; Shaffer, 2010; Pinnuck, 2012), but none of these report specific evidence on fair value accounting usefulness to investors. This paper argues that, in order to fully evaluate the effects of mandatory IAS/IFRS adoption in Europe on the quality of financial reporting, more analysis is needed. Empirical research covering a longer period, which includes both economic upturns and downturns, as well as financial market turmoil, is necessary to draw more definite conclusions on this issue. In fact, as many have argued (e.g. Milburn, 2008; Song et al., 2010; Palea and Maino, in press), when liquid market prices are not available, mark-to-model accounting introduces "model noise", due to imperfect pricing models and imperfect estimates of model parameters. Consistent with this view, prior research has shown that investors are aware of that and therefore assign less relevance to fair value estimates, which are considered as less trustworthy (e.g. Petroni and Wahlen, 1995; Nelson, 1996; Eccher et al., 1996).

Another topic which deserves further scrutiny is the relative informativeness of IAS/IFRS versus US GAAP. European Regulation 1606/2002 states that "*it is important for the competitiveness of capital markets to achieve convergence (…) This implies an increasing convergence of accounting standards currently used internationally with the ultimate objective of achieving a single set of global accounting standards*". Under this perspective, IASB has long been working closely with the US standard-setter, FASB, to converge the IAS/IFRS and US GAAP requirements. As a result, today the two sets of accounting standards are more aligned than they were a decade ago. For this reason, the US Security Exchange Commission (SEC) allows non-US firms listed on the US stock market to use IFRS. However, while research indicates that accounting quality under

IAS/IFRS generally exceeds that of domestic standards-based accounting amounts, empirical studies on the relative informativeness of IAS/IFRS versus US GAAP have provided mixed evidence (e.g. Bartov et al., 2005; Gordon et al., 2010; Harris and Muller, 1999; Hughes and Sander, 2007; Van der Meulen et al., 2007). Moreover, many of the differences investigated have been eliminated in the meantime. As a result, this literature needs substantial updating.

The only recent study related to this topic is that provided by Barth et al. (2012), who find that value-relevance comparability between IAS/IFRS and US GAAP has increased over time, although some differences still persist, thus providing some support to the standard setters' efforts. Barth et al. however focus their analysis only on net income, book value and cash flows. This paper argues that a key challenge is now to ensure that standard setting activities – especially major agenda decisions and discussion papers – are preceded by an effective evidence-gathering phase. Constructive engagement between academic research and standard setters is essential to make informed decisions. In this perspective, this paper claims that research should now focus on specific financial statement items. A single set of global accounting standards should be the result of those single accounting standards which are found to be most value-relevant, that is to best suit the information needs of investors. As a result, empirical research should turn to the specific IASB and FASB joint projects, with the purpose of providing evidence which can support standard setting decisions on specific issues. For instance, accounting for financial instruments, revenue recognition and lease accounting are currently up for discussion and therefore deserve attention from academic research.

Finally, as highlighted by Ball (2006), a single set of high quality global accounting standards would provide different advantages. It would provide easier access to foreign capital markets and would make cross-border acquisitions and divestitures easier. Moreover, it should lower the cost of capital for companies both in absolute terms and in comparison with other firms by increasing international comparability. As a result, a single set of global accounting standards should make capital markets more efficient and level the playing field for firms worldwide. On the other hand, empirical research has widely documented that financial reporting quality is only one of the factors necessary to build a more integrated capital market. Differences in national enforcement regimes, legal systems, auditing practices, corporate governance, ethical norms and financial service industries raise doubts on how much a single set of accounting standards can achieve without the mechanisms for securing uniform implementation and enforcement.

Undoubtedly, the lack of a global regulator to ensure uniform adoption and enforcement reduces the benefits of common accounting standards. Therefore, there is a need to develop mechanisms that contribute to really making capital markets more integrated and to maximizing the efficacy of international accounting standards.

If building an integrated capital market both at a European and global level is a real desirable goal, then convergence in at least some aspects of the regulatory framework, such as investor protection, market supervision and regulation, tax regulation, or corporate governance standards, should be further promoted starting from Europe itself. This paper therefore argues that, in line with the European Commission's goals, market integration at a European Union level should be further fostered in order to complete the creation of a single market. Harmonization of the legal enforcement systems, competition rules, market access conditions and effectiveness of the legal systems are factors that appear better able to guarantee comparable accounting practices across countries. This is a key issue which deserves further scrutiny and discussion not only at an academic but most of all at a policymaking level.

The G20 governments also have a key role to play in this process, as do national and regional standard setters and regulators. The G20 governments have endorsed the aim of establishing a single set of high quality global accounting standards at their London summit in April 2009, in the early days of the global financial crisis, and they have reiterated it several times. Effective political support is critical to this project, as whether the world gets a single set of accounting standards will be determined by governments, not by standard setters.

Having said this, it must also be taken into account that IAS/IFRS will in any case be a global language with many different dialects. An important feature of IAS/IFRS is in fact that they are primarily principle-based, that is they establish broad rules and guidance on a conceptual basis for accountants to follow, instead of specifically outlined rules. IAS/IFRS are quite open and flexible, and therefore able to fit diverse institutional settings and traditions. This is critical when applying IAS/IFRS on an international scale, as effective use of IAS/IFRS varies greatly with the context. As a result, differences in IAS/IFRS implementation will no

doubt persist as we do not live in a homogeneous world. However, as long as high accounting standard quality is maintained, we should not worry about the emergence of local dialects, so long as they are close enough to their mother tongue to be understood without difficulty.

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Determinants and features of voluntary disclosure in the Chinese stock market

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A B S T R A C T

This paper offers in-depth analysis of the determinants and features of voluntary disclosure based on information in the annual reports of 1066 Chinese firms listed on the Shanghai and Shenzhen Stock Exchanges. This extensive sample represents about 80% of all public companies in China. Our findings suggest that voluntary disclosure in China is positively related to firm size, leverage, assets-in-place, and return on equity and is negatively related to auditor type and the level of maturity or sophistication of the intermediary and legal environments. We also find some evidence to suggest a quadratic convex association between state ownership and voluntary disclosure. However, our analysis provides no evidence that extensive disclosure benefits public companies in China in the form of a lower cost of equity.

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1. Introduction

Voluntary disclosure is a common way for a public company to disseminate company information not required by mandatory disclosure requirements to its investors and the general public. Earlier studies have suggested that this type of disclosure may benefit both investors and the public companies themselves in

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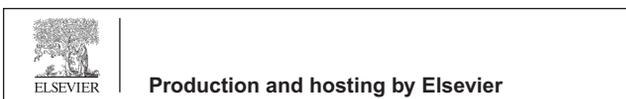
specific areas. For example, Diamond and Verrecchia (1991) and Kim and Verrecchia (1994) claim that voluntary disclosure can reduce information asymmetry between informed and uninformed investors. Moreover, empirical studies carried out by Barry and Brown (1986), Botosan (1997) and Piotroski (1999) demonstrate, among other things, that voluntary disclosure helps to reduce the cost of equity.

However, more recent studies have indicated that the abovementioned benefits may not hold for all stock markets. Using a dataset comprising 110 public companies with both A- and B-share listings in China, Wang et al. (2008) investigate the effects of voluntary disclosure and find no evidence that these companies benefited from that disclosure in the form of a lower cost of debt capital. Their analysis suggests that voluntary disclosure in the Chinese stock market exhibits determinants and characteristics that may be very different from those found in the stock markets of developed countries.

We intend to carry this line of thought further by investigating more closely the determinants and consequences of voluntary disclosure in the Chinese stock market using a much larger dataset – 1066 Chinese public companies – than that used in Wang et al. (2008). This extensive dataset represents about 80% of public companies listed on the Chinese stock exchanges that have a relatively complete historical record of annual reports.

Our investigation is motivated by two considerations. First, since their establishment in 1990 and 1991, respectively, the Shanghai and Shenzhen Stock Exchanges have become major global stock exchanges in terms of total capitalization, trading volume and the rapid pace of growth in the number and size of public companies. Also, a large individual investor population trades shares on both exchanges and China boasts an ever-increasing number of institutional investors. Further, foreign investors with Qualified Foreign Institutional Investor (QFII) status have also begun to invest directly in the Chinese stock market. Previous studies have found that both individual and institutional investors in China are less experienced and more restricted than their counterparts in developed countries such as the United States (Chen et al., 2004; Bailey et al., 2009; Deng and Xu, 2011), which may influence their understanding of financial reports and, in turn, affect the disclosure motivation of listed firms. The growing complexity of China's stock market calls for a better understanding of the key aspects involved, which will benefit investors, public companies, and regulators alike. Voluntary disclosure is one such key aspect, the effects of which concern all of these market players.

Second, China has a distinct political and geographical environment. As an emerging economy, China's capital market is not as efficient as those in developed countries, such as the United States. Moreover, the country's regulatory environment is less mature than those in developed countries, which have taken half a century or more to develop. Also different from more mature economies, the majority of listed companies on the Chinese stock exchanges are ultimately controlled by the central or local governments owing to the country's long history of a planned economy. These firms are called state-owned enterprises (SOEs). A large percentage of SOEs are in essential industries, rich in resources, and directly responsible to the government, and often enjoy rights and privileges unavailable to private companies. Consequently, they have different corporate governance mechanisms compared to firms listed in the United States, most of which are privately controlled (Xu and Wang, 1999; Qiang, 2003; Clarke, 2003; Wang et al., 2004). These corporate governance mechanisms result in the Chinese stock market having a number of distinct characteristics that in turn influence the determinants and consequences of voluntary disclosure by the public companies listed in China.

These two considerations suggest both the necessity and the particularity of an in-depth, thorough investigation aimed at reaching a better understanding of the nature and effects of voluntary disclosure in the Chinese stock market.

Some studies have been conducted in this and related areas. Ferguson et al. (2002) examine voluntary disclosures in the annual reports of SOEs listed on the Hong Kong Stock Exchange and conclude that these companies tend to disclose significantly more information than other companies listed on the same exchange. Using a dataset of the 300 largest public companies at that time, Xiao et al. (2004) analyzes the factors behind Chinese listed companies' voluntary adoption of Internet-based financial reporting and the extent of their disclosure. Wang et al. (2008) conduct a more focused study to test the determinants and consequences of voluntary disclosure in China using a relatively small sample comprising only firms issuing both A and B

shares. Our study can thus be viewed as a natural step forward in offering more extensive analysis based on a greatly expanded dataset.

The dataset we use includes all companies listed on the Shanghai and Shenzhen Stock Exchanges at the end of 2006, with the exception of banks and insurance companies. The level of voluntary disclosure is modeled by DSCORE, an index score generated on the basis of the voluntary information released in firms' annual reports. This score has its origins in earlier studies, such as those of Botosan (1997), and is tailored to the Chinese context.

A set of factors commonly investigated in the literature, including firm size, leverage, liquidity, assets-in-place, return on equity (ROE), auditor type, and ownership diffusion, among others, is analyzed to determine the effects of each on voluntary disclosure. Our statistical analysis reveals that firm size, leverage, assets-in-place, ROE, ownership diffusion, and auditor type are significantly associated with voluntary disclosure, with auditor type strongly associated. However, our findings suggest that liquidity and the proportion of non-executive directors on the board have no significant influence on voluntary disclosure. We also add two Chinese market-specific factors, the intermediary and legal environments and state ownership, to the regression to test whether they play any role in the voluntary disclosure decision. Although most of the foregoing general factors remain significant in this regression, we find a negative and significant relationship between the intermediary and legal environments and voluntary disclosure.

With regard to state ownership, we conjecture that it has a quadratic convex relationship with the level of disclosure, as there is both theoretical and empirical evidence to suggest a more complicated association between the two than a linear relationship. To further test the influence of state ownership and governance, we carry out another test by first dividing the sample into two subsets based on the firms' ultimate owners and then performing the regression separately on each subset.

In this test, many of the aforementioned factors lose their significance in one or both subsets. For firms ultimately controlled by the government, firm size, ROE, auditor type, the intermediary and legal environments, and state ownership remain significant and in the same direction as those in the general regression. For firms ultimately controlled by private families, leverage, auditor type, ownership diffusion, and state ownership remain significant. This evidence demonstrates the different characteristics underlying the disclosure preferences of different types of firms. What is particularly notable is that the signs of the coefficients of state ownership in the two regressions are opposite: the level of disclosure decreases with state ownership in privately controlled firms, but increases in government-controlled firms. These results reveal a clear quadratic association between state ownership and voluntary disclosure, as predicted.

To test the relevance of voluntary disclosure to the cost of equity in the capital market, we construct an ordinary least squares (OLS) model between the two. The results of the model reveal no evidence that firms benefit from extensive voluntary disclosure in terms of a lower cost of equity, which is contrary to the claims made in studies of stock markets in developed countries. In China, voluntary disclosure appears to have no significant influence on the cost of equity.

This study contributes to a better understanding of the determinants and features of voluntary disclosure in the fast-growing Chinese stock market. By examining a much larger dataset than previous studies and testing a wider range of factors, we are able to report relatively reliable, more general results and to offer useful insights into investors, public companies, and regulators with regard to voluntary disclosure in the Chinese context.

The remainder of the paper is organized as follows: Section 2 develops our hypotheses with the help of prior theoretical results. Section 3 describes the sample dataset and test methods, and Section 4 reports the empirical test results. Section 5 analyses the regression results and Section 6 concludes the paper.

2. Hypothesis development

This section develops 11 hypotheses that are subjected to statistical testing. These hypotheses are developed with reference to two well-known theories, agency theory, and signaling theory, which are briefly reviewed here in the context of voluntary disclosure. The section also offers a discussion of relevant issues such as corporate governance, litigation risk, and proprietary costs. This review and discussion provide the foundation and justification for the explanatory variables extracted and considered in our hypothesis development.

2.1. Agency theory variables

Agency theory suggests the existence of information asymmetry, and thus possible conflicts of interest, between investors and firm management. Consistent with this theory, management's incentive to engage in voluntary disclosure has been shown to be influenced by such factors as leverage and assets-in-place (Jensen and Meckling, 1976; Chow and Wong-Boren, 1987; Lang and Lundholm, 1993; Hossain et al., 1995).

2.1.1. Leverage

Previous studies have provided mixed evidence on the relationship between leverage and the level of voluntary disclosure. Belkaoui and Kahl (1978), Fries et al. (1993), Hossain et al. (1995) and Barako et al. (2006) suggest that the two are positively related in developed markets and in some emerging markets, and Francis et al. (2005) obtain results consistent with this suggestion using a multinational database. Chow and Wong-Boren (1987) and El-Gazzar et al. (2008), in contrast, claim that leverage is not a determinant of voluntary disclosure, as they find no significant relationship between the two in their analysis. Eng and Mak (2003) find a negative relationship between leverage and voluntary disclosure using a Singaporean sample.

However, the widely held view remains that firms with a higher degree of leverage suffer serious agency problems and incur higher agency costs. Leveraged firms are more likely to disclose more information voluntarily to satisfy the information acquisition requirements of creditors and to lower the cost of raising capital. Fama and Miller (1972) provide a classic result along this line, showing that a positive relationship exists between firms' voluntary disclosure and the degree of leverage owing to high agency costs. Using the ratio of total debt to total assets as a measure of leverage, we develop the following hypothesis to test our conjecture that there is a positive relationship between leverage and the level of voluntary disclosure among Chinese public companies.

H1. A firm's disclosure level is positively related to its degree of leverage.

2.1.2. Assets-in-place

Myers (1977) asserts that the degree of difficulty a firm has in transferring wealth between shareholders and debt-holders grows with larger assets-in-place. The implication is that fewer agency problems and less information asymmetry may exist in firms with larger assets-in-place, thus indicating a positive relationship between assets-in-place and disclosure.

An alternative explanatory theory is proprietary cost theory, which posits that the potential entry of new competitors into a market influences the future profitability of established firms in a given industry. Therefore, firms that are protected in their sectors by high entry barriers are likely to disclose more information than firms that are not.[1] Fixed assets are usually employed to measure proprietary costs, as they are an easily measurable indicator of barriers to entry. It thus appears likely that a positive relationship exists between larger fixed assets and voluntary disclosure.

However, the existing empirical research reports conflicting evidence from different countries. Bradbury (1992) and Hossain et al. (1995) find no significant relationship between assets-in-place and the extent of voluntary disclosure in New Zealand, whereas Haniffa and Coode (2002) report a positive relationship in Malaysia.

As China is still in the early stages of a market economy, the assets-in-place barrier is very important to many firms, as it protects them from potential competitors. Thus, we conjecture that there is a positive relationship between assets-in-place and voluntary disclosure across the board in Chinese public companies, as stated in our second hypothesis. Note that we use the ratio of fixed assets to total assets as our measurement of assets-in-place.

H2. The disclosure level is positively related to assets-in-place.

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[1] Proprietary costs can be measured by barriers to entry. More details can be found in Darrough and Stoughton (1990) and Darrough (1995).

2.2. Signaling theory variables

Signaling theory posits that firms with good performance tend to make voluntary disclosures more readily, as doing so is regarded as an easy means of distinguishing themselves from others in the marketplace. Hence, we conjecture that voluntary disclosure is positively related to firm performance and quality. Both Chow and Wong-Boren (1987) and Lang and Lundholm (1993) provide empirical support for this supposition.

2.2.1. Liquidity

Liquidity represents a firm's ability to meet its short-term liabilities. Firms with greater liquidity are considered to be operating better businesses. In accordance with signaling theory, these firms are prone to disclose more information voluntarily (Cooke, 1989).[2] Agency theory, in contrast, suggests the opposite conclusion: to alleviate information asymmetry, firms with less liquidity are likely to release more information to investors, creditors in particular. Indeed, several studies (e.g., Wallace et al., 1994) claim that weak liquidity may prompt firms to amplify their disclosure to justify their liquidity status.

The empirical findings on the liquidity-disclosure relationship are also inconclusive. Wallace et al. (1994) document a negative relationship between liquidity and disclosure in both listed and unlisted Spanish companies, whereas Alsaeed (2006) and Barako et al. (2006) find no significant relationship in Saudi Arabia or Kenya. No previous study in China has taken liquidity into consideration. Using the current ratio as a proxy for liquidity, we conjecture that there is generally a positive relationship between the two in Chinese public companies, as stated in the following hypothesis.

H3. The disclosure level is positively related to liquidity.

2.2.2. ROE and auditor type

Under the signaling theory framework, firms with strong performance and good quality have more incentives to voluntarily disclose information to distinguish themselves from underperforming firms. Singhvi and Desai (1971) claim that greater profitability may induce management to supply more information, to illustrate its ability, to maximize shareholder value, and to elevate managerial compensation.

Auditor type (or rank) is popularly employed as a signal to the market. Financial reports audited by higher ranking auditors are regarded as better in quality and more credible. However, the literature provides mixed evidence in this respect. Using a relatively small dataset, Xiao et al. (2004) find a positive relationship between the Big 5 (or Big 4) auditors and internet-based voluntary disclosure in China.[3] However, several studies (Hossain et al., 1995; Depoers, 2000; Alsaeed, 2006) have shown that neither Big 5 (nor Big 6) auditors nor ROE have a significant influence on management's disclosure decision.

We use both auditor type and ROE as proxies of firms' performance quality and posit a positive relationship between both proxies and voluntary disclosure in Chinese public companies, as stated in the two following hypotheses.

H4. The disclosure level is positively related to a firm's ROE.

H5. Firms audited by the Big 4 are more likely to disclose information voluntarily.

2.3. Corporate governance variables

Firms' level of corporate governance also appears to be an important influential factor in their decision to make voluntary disclosures. As many studies argue, sound corporate governance mechanisms are treated as a sign that the firm in question has strong management and better monitoring in place, which in turn leads to

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[2] Cooke (1989) provides evidence to show that firms with a higher degree of liquidity enjoy a sounder financial position. Therefore, they are more willing to disclose information than those suffering a low degree of liquidity.

[3] The sample used by Xiao et al. (2004) is made up of the 300 largest listed companies in China, which is a much smaller sample than that used in this research.

more voluntary disclosures. Jaggi and Yee Low (2000), Eng and Mak (2003) and Chen et al. (2008) find some evidence to support that argument in Singapore and the United States.

2.3.1. Ownership diffusion

Ownership diffusion is a variable used to measure a firm's governance mechanism. The more diffuse its ownership is, the better able its owners are to monitor managerial behavior and thus require greater information disclosure. Alsaeed (2006) finds a positive relationship between the extent of voluntary disclosure and the ownership diffusion in Saudi Arabian companies. Hossain et al. (1994) and Haniffa and Coode (2002), in contrast, show that the level of disclosure among Malaysian companies is inversely related to their ownership diffusion level. Many other empirical studies have failed to find a statistically significant relationship.[4]

We use the average shareholding proportion, which is the total number of shares divided by the total number of shareholders for each individual firm, as a measure of ownership diffusion. Informed by corporate governance theory, we hypothesize a positive diffusion-disclosure relationship in the Chinese stock market.

H6. A firm's disclosure level is positively related to its degree of ownership diffusion.

2.3.2. Proportion of non-executive directors on the board

Similar to ownership diffusion, the proportion of non-executive directors on the board are also a measure of corporate governance or monitoring capability. Non-executive directors are less aligned with management and are therefore more inclined to encourage firms to disclose a larger amount of information to outside investors. Jaggi and Yee Low (2000) find empirical evidence to show that the proportion of independent directors have a positive influence on disclosure, and Xiao et al. (2004) produce similar results using a limited dataset in China. We conjecture that the same relationship holds for Chinese public companies more generally and test this conjecture using a much larger and more general dataset than that used by Xiao et al. (2004).

H7. A firm's disclosure level is positively related to the proportion of non-executive directors on its board.

2.3.3. State ownership

State ownership is a somewhat distinct feature of the Chinese stock market. Before China implemented market reforms and adopted an open-door policy, almost all firms in the country were totally owned by the government. These firms are referred to as SOEs. It was only after 1978, and especially after 1990 when the Shanghai and Shenzhen Stock Exchanges were established, that the Chinese government began to encourage private business and, at the same time, took a series of actions to promote the privatization of SOEs. Although an increasing number of public companies are owned by non-government entities, a majority of listed companies on the Shenzhen and Shanghai Stock Exchanges remain ultimately owned by the central or local governments.[5] Even in firms that are ultimately controlled by a private family, state ownership still plays an important role.

Compared with other types of firms in China, particularly private firms, state-owned firms tend to be perceived as suffering from more severe information asymmetry, agency problems, and adverse selection costs. Such a perception may prompt the management of these firms to disclose additional information to ease investors' concerns regarding their quality, the role of the government as a major shareholder, and other issues. Wang et al. (2008) indeed find the level of disclosure to be positively related to the proportion of state ownership.

In contrast, Ferguson et al. (2002) argue that because red-chip firms face a more uncertain situation and higher competition costs on the Hong Kong Stock Exchange, they seem to disclose less information than H-share firms. State ownership has also been associated with a lack of emphasis on efficiency and profitability, which suggests a negative relationship between state ownership and disclosure. Consistent with this argument, Xiao et al. (2004) find that companies with a higher proportion of state ownership make fewer internet-based

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[4] See, for example, Raffournier (1995) and Donnelly and Mulcahy (2008).

[5] In our sample, 722 of the 1058 firms were ultimately controlled by the government, with the other 366 ultimately controlled by private families.

disclosures to the public. These inconclusive empirical results motivate us to conjecture that rather than a common linear relationship, and there may be a more complicated association between state ownership and voluntary disclosure. Tian and Estrin (2008) find that the relationship between state ownership and corporate value is U-shaped, and Fan et al. (2006) find that most Chinese listed firms are ultimately controlled by local governments and private entrepreneurs. We posit that when the proportion of state ownership is relatively small (usually in privately controlled firms), less state ownership means more uncertainty and more competition, which induces firms to disclose more information voluntarily. After a certain point, however, when state ownership accounts for a large proportion of total shares (usually in state-controlled firms), agency theory starts to apply. Thus, the higher the proportion of state ownership, the more severe the agency problem and the more voluntary disclosure there is to alleviate that problem and lower the cost of capital.

H8. A quadratic relationship exists between state ownership and the disclosure level: the disclosure level initially decreases with state ownership, but then increases with ownership after it reaches a certain point.

2.4. Litigation risk-related variables

Litigation risk also tends to prompt firms to make voluntary disclosures. Previous studies show that litigation risk is always under consideration when the management of a firm makes a voluntary disclosure decision. Field et al. (2005), for example, show that firms with greater litigation risk tend to voluntarily release more information. There is also some evidence that firms with bad news are more willing to disclose information to avoid possible lawsuits.

2.4.1. Intermediary and legal environments

The legal environment obviously affects the voluntary disclosure level of the firms operating therein. La Porta et al. (1998) claim that when investors have relatively few legal rights, managers can be induced to return money to them if one or a very small number of them owns the majority of shares. Evidence from Jaggi and Yee Low (2000) suggests that firms from common law countries are associated with higher levels of financial disclosure relative to firms from code law countries.[6]

However, previous studies on voluntary disclosure have paid insufficient attention to the legal and intermediary environments of listed companies, single-nation research in particular. For reasons to be stated, it seems that the legal environment may have a strong bearing on the voluntary disclosure behavior of public companies, particularly in China. China has a more diverse geographical range than many other countries, leading to a more diversified market and greater regional disparities in the legal environment. At the same time, for reasons of policy and history, the development levels in China's various regions and provinces have not been even. For instance, different provinces may have different preferential policies or rules to encourage investment and the growth of local niche sectors. Such unevenness contributes to a distinct legal environment in China, and it is in this environment that Chinese public companies must operate.

The legal environment also shapes the development of an intermediary environment, the sophistication of which obviously plays an important role in shaping the behavior of public companies. In a more advanced intermediary environment, firms tend to disclose more information to satisfy intermediary institutions' requirements for more information. Fan et al. (2007) create an index to measure the development of a combined intermediary and legal environment for each province in China. We use their index for 2006 in this study. Based on the foregoing arguments, we predict the intermediary and legal environments to have positive effects on firm disclosure. Consistent with Jaggi and Yee Low (2000), we also predict that intermediary advancement and legal system development have positive effects on voluntary disclosure.

H9. The disclosure level is positively related to the level of development in the intermediary and legal environments in which a firm operates.

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[6] La Porta et al. (1998) claims that "relatively speaking, common law countries protect investors the most, and French civil law countries protect them the least. German civil law countries are in the middle, though probably closer to the civil law group."

2.5. Proprietary theory variables

Voluntary disclosure may burden the disclosing firm with the so-called proprietary costs. Verrecchia (1983) was the first to take proprietary costs into consideration when modeling management's disclosure decisions. When information that may reveal certain crucial aspects of a firm's operations is disclosed to investors, it is also disclosed to the firm's competitors, which may disadvantage it competitively (Lev, 1992; Darrough, 1995). In this regard, firms tend to hide information when proprietary costs are sufficiently high.

2.5.1. Firm size

King et al. (1990) investigate the relationship between disclosure and firm size. Their study of the so-called transaction cost hypothesis indicates that the level of disclosure increases with firm size, as the incentives for private information acquisition are greater for large firms. An alternative explanation is the legal cost hypothesis (Skinner, 1992), which posits that disclosure increases with firm size because the dollar value of securities litigation damages is a function of firm size.

Other work has produced similar results. Lang and Lundholm (1993), for example, find evidence to show that larger firms tend to disclose more information in the United States. Chow and Wong-Boren (1987), Cooke (1989), Hossain et al. (1994, 1995), Depoers (2000) and Eng and Mak (2003) report similar results for Mexico, Sweden, New Zealand, France, and Singapore, respectively. A previous study in the Chinese market using a sample of listed firms issuing both A and B shares (Wang et al., 2008) suggests a positive relationship between firm size and disclosure.

Drawing on signaling theory, we predict a positive relationship between firm size and disclosure in the Chinese stock market in general, not just in particular sections of the market. To test this prediction, we develop the following hypothesis and use the natural log of a firm's total market value as our measure of firm size.

H10. The disclosure level is positively related to firm size.

2.6. Cost of equity

With reference to agency theory, Barry and Brown (1986) conclude that firms with a high level of disclosure are more likely to have a lower cost of capital, and a number of empirical studies have produced results consistent with that conclusion. Botosan (1997) finds that in firms with low analyst following, there is a negative relationship between the cost of equity and the extent of voluntary disclosure. Francis et al. (2005) also find that firms engaging in more extensive disclosure have a lower cost of both debt and equity after controlling for cross-country institutional differences in legal and financial systems.

As the Chinese stock market is still in its early stages of development, whether agency theory, which applies in the United States, holds among Chinese public companies is an empirical question. Wang et al. (2008) test the relationship between disclosure and the cost of debt using a partial Chinese dataset and find no significant association. We carry out a similar test in this study using a large sample of firms in the Chinese stock market to determine whether there is any association between the cost of equity and voluntary disclosure in the Chinese context. Our final hypothesis is as follows:

H11. The cost of equity is negatively related to the disclosure level.

3. Methodology

3.1. Sample selection

The firms included in this study were selected from the entire list of companies that traded shares on the Shanghai and Shenzhen Stock Exchanges at the end of 2006. As of December 31, 2006, there were 576 firms listed on the Shenzhen Stock Exchange and 824 firms listed on the Shanghai Stock Exchange. Banks and insurance firms were excluded because their business activities and financial reports are not comparable with those of firms in other industries. A few additional firms were also excluded, as they lacked some of the

Table 1
Sample description.

	Number of firms	%
Panel A: Industry distribution		
Real estate	117	10.98
Commercial	74	6.94
Public service	72	6.75
Industrial firms	730	68.48
Other	73	6.85
Total	1066	100.00
Panel B: Ultimate ownership		
State-controlled	722	67.73
Private-controlled	336	31.52
Foreign firm-controlled	8	0.75
Total	1066	100.00

required data. The final sample thus includes 653 firms listed on the Shanghai Stock Exchange and 422 listed on the Shenzhen Stock Exchange. These firms represent more than 80% of all public companies in China in 2006.

Disclosure level information was collected for each firm from the annual reports published by the two stock exchanges. Information about their attributes and cost of equity was collected from the WIND and GTA databases. Table 1 presents the industry and ultimate controller categories of the sample firms.

3.2. Variable measurement

3.2.1. Dependent variable: disclosure index

Following previous studies (Chow and Wong-Boren, 1987; Cooke and Wallace, 1989; Ferguson et al., 2002; Gray et al., 1995; Hossain et al., 1995; Botosan, 1997; Xiao et al., 2004; Wang et al., 2008), we use a two-step approach to develop a disclosure index for the sample firms:

Step 1. Generate a preliminary list of 136 items as the initial disclosure index.
Step 2. Use Chinese accounting standards to select discretionary items from the 136-item list to create the final disclosure index.

As a result, 17 items related to mandatory disclosure are eliminated. The final voluntary disclosure index thus includes 119 items, all of which are evaluated with the corresponding information disclosed in the sample firms' annual reports, and serves to measure the extent of voluntary disclosure.[7]

For most of the items, the following quantitative measure is used. If a firm disclosed an item from the list, it receives a score of 1 and 0 otherwise. For forecast items, the following quantitative measure is adopted. A score of 2 is assigned for these items if a firm provided a point estimate, a score of 1 if it provided interval estimates and a score of 0 if it provided no forecast of any kind. The sum of the scores that a firm received for all items was its raw score. Because we focus on all users of corporate annual reports rather than any specific user group requiring specialized information, we do not assign different weights to different items, but assume that each item is equally important when computing the raw score (see Cooke, 1989; Gray et al., 1995). Similar to Botosan (1997), we calculate the disclosure score by a relative value, which is the raw score of an individual firm divided by the maximum raw score in the sample and multiplied by 1/5, as follows:

$$DSCORE^{i} = \frac{RAW\ SCORE^{i}}{MAX\ SCORE} * 20\%$$

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[7] See Appendix A.

Table 2
Explanation of independent variables.

Firm size (LMV)	Natural log of total assets at year-end
Leverage (D/A)	Ratio of total debt to total assets at year-end
Assets-in-place (FA/A)	Ratio of fixed assets to total assets at year-end
Liquidity (Liquidity)	Current ratio of firm at year-end
Return on equity (ROE)	Net income divided by shareholders' equity at year-end
Auditor type (Audit)	Dummy variable, where 1 represents a firm audited by the BIG-4, and 0 otherwise
Ownership diffusion (Avershare)	Average proportion of shares held by each individual investor
Non-executive directors (NED)	Proportion of non-executive directors on the board
State ownership (State)	Proportion of shares held by the government
Intermediary and legal environments (I&L)	Index developed by Fan et al. (2007) that represents the development of the intermediary and legal environment of China's provinces

3.2.2. Independent variables

The independent variables are firm attributes that we judge to be possible determinants of a firm's disclosure level. These variables, listed in Table 2, were measured using 2006 year-end data from the WIND and GTA databases.

3.2.3. Cost of equity

A variety of methods have been developed to measure the cost of equity. Typical among these are the dividend discount model (Botosan, 1997; Botosan and Plumlee, 2002; Francis et al., 2008), applied cost of capital model (Ashton, 2005) and generalized least squares (GLS) model (Gebhardt et al., 2001). As the first two of these rely on forecast and value-line information, which are unavailable in China, we adopt the GLS model developed by Gebhardt et al. (2001). The model structure is as follows:

$$P_t = B_t + \frac{\text{FROE}_{t+1} - r_t}{(1 + r_t)} B_t + \frac{\text{FROE}_{t+2} - r_t}{(1 + r_t)^2} B_{t+1} + \text{TV}$$

where $B_t =$ the book value of the firm in 2006 divided by the number of shares outstanding in each period, $r_t =$ the cost of equity, and $\text{FORE}_{t+I} =$ the forecast ROE for period $t + i$. For the first six periods,[8] we obtain the values directly from the firms' annual reports. Beyond the sixth period, we forecast FORE using a linear interpolation to the industry median ROE. $B_{t+I} = B_{t+i-1} + \text{FEPS}_{t+I} - \text{FDPS}_{t+i}$, where FDPS_{t+i} is the forecast dividend per share for period $t + i$, estimated using the current dividend payout ratio (k). We assume $\text{FDPS}_{t+i} = \text{FEPS}_{t+i} * k$. Finally, TV refers to the terminal value of the firm. For any horizon T, the terminal value calculation is given as

$$\text{TV} = \sum_{i=3}^{T-1} \frac{\text{FROE}_{t+i} - r_t}{(1 + r_t)^i} B_{t+i} + \frac{\text{FROE}_{t+T} - r_t}{r_t(1 + r_t)^{T-1}} B_{t+T}$$

Consistent with Gebhardt et al. (2001), we forecast earnings for up to 12 periods and estimate a terminal value, TV, for cash flows beyond period 6. The industry target ROE is a moving median of the ROEs of all firms in a given industry in the 10 years prior to 2006. We exclude loss firms on the assumption that the population of profitable firms better reflects long-term industry equilibrium rates of returns. The dividend payout ratio (k) is calculated as the average dividend payout ratio over the past 10 years or as long as the firm remains listed.

4. Results

4.1. Descriptive statistics

Panel A of Table 3 reports the descriptive statistics of the dependent and independent variables in this study. The raw score ranges from 23 to 70 and DSCORE from 1.6429 to 5. The overall mean for DSCORE

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[8] We calculate the cost of equity over a quarterly horizon.

Table 3
Summary statistics.

Variable	Mean	Median	Maximum	Minimum	Standard deviation
Panel A: Descriptive statistics, N = 1066					
Raw score	41.4545	42	70	23	7.3036
DSCORE	0.1184	0.12	0.2	0.0657	0.0209
LMV	21.4583	21.2699	27.3962	19.4364	1.0256
D/A	0.5074	0.5198	5.4936	0.0207	0.2354
Liquidity	0.8571	0.9291	1	0.0524	0.1766
FA/A	0.3240	0.2947	0.9564	0.0005	0.1911
ROE	8.0173	7.17	104.49	-175.5	14.7212
Audit	0.0732	0	1	0	0.2605
Avershare	0.0546	0.0405	0.3432	0.0016	0.0484
NED	0.3558	0.3333	1	0.1111	0.0656
I&L	6.6287	5.52	13.07	1.49	3.2219
State	0.3158	0.3401	0.8375	0	0.2300

Variable	Raw score	DSCORE	LMV	D/A	FA/A	Liquidity	ROE	Audit	Aver-share	NED	I&L	State
Panel B: Correlation matrix												
Raw score	1.00											
DSCORE	0.99*	1.00										
LMV	0.11*	0.1021*	1.00									
D/A	−0.01	−0.01	−0.06*	1.00								
FA/A	0.08*	0.0922*	0.11*	−0.01	1.00							
Liquidity	−0.10*	−0.0834*	−0.23*	−0.14*	−0.34*	1.00						
ROE	0.10*	0.0896*	0.30*	−0.13*	−0.08*	−0.03*	1.00					
Audit	−0.06	−0.06	0.44*	−0.04*	0.09*	−0.15*	0.04	1.00				
Avershare	0.02	0.02	−0.14*	0.01	−0.15*	0.16*	0.17*	−0.08*	1.00			
NED	−0.04	−0.04	−0.04	0.001	−0.04*	0.02	−0.00	−0.00	0.04*	1.00		
I& L	−0.11*	−0.0972*	0.17*	−0.03*	−0.19*	0.08*	0.04*	0.17*	0.03*	0.04*	1.00	
State	0.04	0.03	0.27*	0.02	0.17*	−0.16*	0.02*	0.09*	−0.22*	−0.06*	−0.05*	1.00

* Statistically significant at the 0.05 level.

is 2.9610, which is an approximation of the median value. Only a small proportion, just 7.32%, of the sample firms were audited by Big 4 auditors. A relatively high proportion of shares in the sample firms were held by the government (the mean value is 31.58%).

Panel B of Table 3 presents the Pearson correlation between each pair of independent variables. It is generally accepted that correlations between independent variables are not harmful in multivariate analysis unless they exceed 0.80 or 0.90 (Gujarati, 1988). The Pearson correlation values shown in Panel B suggest that multicollinearity between the independent variables is unlikely to pose a serious problem in interpreting the results of our multivariate analysis, as they are all less than the stated threshold.

4.2. Multivariate tests

4.2.1. Results for commonly tested factors in China

Of the independent variables included in this study, the most commonly tested in the Chinese context are firm size, leverage, assets-in-place, liquidity, ROE, auditor type, ownership diffusion, and the proportion of non-executive directors. We use an OLS model as a multivariate test to assess the effect of each of these variables on voluntary disclosure in the Chinese market. Our test is based on the following model.

$$\text{DSCORE} = \beta_0 + \beta_1 \text{LMV} + \beta_2 \text{D/E} + \beta_3 \text{FA/A} + \beta_4 \text{Liquidity} + \beta_5 \text{ROE} + \beta_6 \text{Audit} + \beta_7 \text{Avershare} + \beta_8 \text{NED} + e$$

To account for differences in voluntary disclosure in different industries, an additional test is performed using the adjusted disclosure score (Adj-DSCORE) rather than DSCORE. A firm's Adj-DSCORE is equal to its DSCORE minus the average DSCORE of the industry to which it belongs. The adjusted model is as follows:

$$\text{Adj-DSCORE} = \beta_0 + \beta_1 \text{LMV} + \beta_2 \text{D/E} + \beta_3 \text{FA/A} + \beta_4 \text{Liquidity} + \beta_5 \text{ROE} + \beta_6 \text{Audit} + \beta_7 \text{Avershare}$$
$$+ \beta_8 \text{NED} + e$$

The results of these tests are summarized in Table 4, which shows that the general regression and industry-adjusted regression results are consistent for most of the variables, implying that they are quite robust. The coefficients of firm size and assets-in-place are highly significant, whereas those for leverage, ROE, and ownership diffusion are only marginally significant. These findings are consistent with both existing theories and our hypotheses. The sign of auditor type, in contrast, is significantly negative, which is inconsistent with our prediction, prior empirical findings (Xiao et al., 2004; Wang et al., 2008) and traditional signaling theory. It is possible that firms audited by the Big 4 attract more attention than other firms and release more information through other channels, such as the media, and therefore rely less on voluntary disclosure in annual reports. The coefficient of liquidity is negative and marginally significant in the general regression, but loses its significance in the industry-adjusted regression. These test results indicate that we can take liquidity and the proportion of non-executive directors on the board as insignificant variables in explaining voluntary disclosure levels.

4.2.2. Specific roles of intermediary and legal environments and state ownership

China stands out from other counties in terms of its large and diversified regions and the state ownership of its firms. We test H8 and H9 to determine the influence of the intermediary and legal environments (I&L) and state ownership (State) on the disclosure level. We add these two variables into the equation to determine whether they have additional explanatory power. As previous empirical studies have reported inconsistent evidence concerning the sign of state ownership, we hypothesize a convex quadratic association between State and DSCORE. The models we test are as follows:

$$\text{DSCORE} = \beta_0 + \beta_1 \text{LMV} + \beta_2 \text{D/E} + \beta_3 \text{FA/A} + \beta_4 \text{Liquidity} + \beta_5 \text{ROE} + \beta_6 \text{Audit} + \beta_7 \text{Avershare}$$
$$+ \beta_8 \text{NED} + \beta_9 \text{I\&L} + \beta_{10} \text{State} + \beta_{11} \text{State}^2 + e$$

Table 4
Relationship between general factors and voluntary disclosure level.

Variable	Expected sign	General regression	Industry-adjusted regression
LMV	+	0.0026***	0.0357***
		(3.51)	(3.42)
D/A	+	0.0071*	0.1052**
		(1.92)	(2.05)
FA/A	+	0.0072**	0.1251**
		(1.99)	(2.49)
Liquidity	+	−0.0068*	−0.0642
		(−1.72)	(−1.15)
ROE	+	0.0001*	0.0012*
		(1.89)	(1.85)
Audit	+	−0.0098***	−0.1383**
		(−3.59)	(−3.61)
Avershare	+	0.0248*	0.3320*
		(1.77)	(1.70)
NED	+	−0.0061	−0.0923
		(−0.57)	(−0.63)
Constant		1.5881	−0.7878
		(3.59)	(−3.21)
Obs.		1038	1038
Adjusted R^2		0.0348	0.0337
F-stat		5.68	5.53
p-Value		(0.0000)	(0.0000)

* Statistically significant at the 0.10 level.
** Statistically significant at the 0.05 level.
*** Statistically significant at the 0.01 level.

$$\text{Adj-DSCORE} = \beta_0 + \beta_1\text{LMV} + \beta_2\text{D/E} + \beta_3\text{FA/A} + \beta_4\text{Liquidity} + \beta_5\text{ROE} + \beta_6\text{Audit}$$
$$+ \beta_7\text{Avershare} + \beta_8\text{NED} + \beta_9\text{I\&L} + \beta_{10}\text{State} + \beta_{11}\text{State}^2 + e$$

The results are summarized in Table 5. When I&L and State are added to the equation, assets-in-place loses its significance in the general regression, and ownership diffusion becomes insignificant in both regressions. The signs and significance of the other common factors remain the same as those reported in Section 4.2.1. These results are consistent with both independence between these factors and between I&L and state ownership.

The coefficient of I&L, $-0.0007/-0.0079$ ($p < 0.01$), is not in the hypothesized direction, which suggests that firms operating in provinces with a more advanced market and better legal environment disclose less information than those in less developed environments. One explanation for the negative statistical association between I&L and DSCORE is that there may be some substitution effect between I&L and voluntary disclosure. The overall legal environment in China is incomplete, and thus, management rarely focuses on litigation risk and legal rights. At the same time, intermediary institutions may not put pressure on firms to disclose more information in annual reports. However, voluntary disclosure and legal advances compensate for each other. Hence, companies in regions with an advanced legal environment tend to disclose less information because the environment itself serves as a signal of a good reputation and transparency.

The coefficients of State and State^2 are highly significant ($p < 0.05$) in both regressions, and their directions are consistent with H8. This convex association suggests that the disclosure level initially decreases with state ownership, but after a certain point, it increases with an increase in state ownership. This finding is largely consistent with those of previous studies on state ownership in the Chinese market (Ferguson et al., 2002). To further verify it, we conduct another test, as reported in the next section.

Table 5
Relationship between I&L, state ownership and voluntary disclosure level.

Variable	Expected sign	General regression	Industry-adjusted regression
LMV	+	0.0026*** (3.35)	0.0363*** (3.32)
D/A	+	0.0073** (2.00)	0.1082** (2.11)
FA/A	+	0.0050 (1.37)	0.1005** (1.97)
Liquidity	+	−0.0063 (−1.59)	−0.0586 (−1.05)
ROE	+	0.0001* (1.87)	0.0012* (1.83)
Audit	+	−0.0086*** (−3.12)	−0.1239*** (−3.22)
Avershare	+	0.0205 (1.44)	0.2743 (1.37)
NED	+	−0.0045 (−0.43)	−0.0761 (−0.52)
I&L	+	−0.0007*** (−3.16)	−0.0079*** (−2.69)
State	−	−0.0215** (−2.28)	−0.2615** (−1.99)
State^2	+	0.0349** (2.40)	0.4097** (2.01)
Constant		0.0691 (3.84)	−0.7303 (−2.90)
Obs.		1038	1038
Adjusted $R2$		0.0459	0.0409
F-stat		5.53	5.02
p-Value		(0.0000)	(0.0000)

* Statistically significant at the 0.10 level.
** Statistically significant at the 0.05 level.
*** Statistically significant at the 0.01 level.

4.2.3. Difference between firms ultimately controlled by the government and those controlled by private families

The evidence in Section 4.2.2 suggests a convex quadratic association between the disclosure level and the proportion of government ownership. At-test and multiple-OLS regression are now used to further investigate the underlying relationship.

Panel A of Table 6 reports the results of a *t*-test between the subgroup of firms ultimately controlled by the government and those ultimately controlled by private families. The null hypothesis that there is no difference in the proportion of government ownership between the two groups (H0: diff = 0) is rejected at the $p = 0.01$ level, indicating that a statistically significant difference does exist. This difference is −0.3693, which suggests that firms ultimately controlled by the government have a much larger proportion of their shares in government hands (36.93%). This finding is consistent with our analysis in Section 4.2.2.

In performing separate multiple regressions for these two groups, many disparities emerge. Firm size and ROE become insignificant for the privately controlled firms, whereas they remain highly significant for government-controlled firms. Debt becomes an insignificant variable for the latter. This is an unsurprising finding in the Chinese context, where state-owned companies are more likely to obtain bank loans because of the

Table 6
State ownership and voluntary disclosure level.

Group	Observ.	Mean	Std. dev.	
Panel A: T-test of the difference in state ownership between privately controlled and government-controlled firms				
0	336	0.0656	0.1329	
1	722	0.4349	0.1603	$t = -36.7576^{***}$
Variable	Private controller		Government controller	
	General regression	Industry-adjusted regression	General regression	Industry-adjusted regression
Panel B: Regression results				
LMV	0.0013	0.0155	0.0029***	0.0401***
	(0.83)	(0.73)	(3.05)	(3.03)
D/A	0.0140**	0.2143**	0.0047	0.0657
	(2.10)	(2.33)	(1.05)	(1.04)
FA/A	0.0040	0.0730	0.0028	0.0785
	(0.55)	(0.72)	(0.66)	(1.29)
Liquidity	0.00002	0.0234	−0.0075*	−0.0734
	(0.00)	(0.19)	(−1.66)	(−1.15)
ROE	0.00002	0.0001	0 .0001**	0.0020**
	(0.27)	(0.11)	(2.11)	(2.27)
Audit	−0.0093	−0.1412*	−0.0075**	−0.1080**
	(−1.56)	(−1.72)	(−2.30)	(−2.36)
Avershare	0.0459**	0.5903**	−0.0088	−0.0294
	(2.31)	(2.15)	(−0.40)	(−0.09)
NED	−0.0220	−0.2990	−0.0028	−0.0546
	(−0.95)	(−0.93)	(−0.24)	(−0.33)
I&L	0.0001	0.0002	−0.0010***	−0.0118***
	(0.31)	(0.04)	(−4.08)	(−3.31)
State	−0.0152*	−0.2101*	0.0092*	0.0948
	(−1.77)	(−1.77)	(1.83)	(1.33)
Constant	0.0890 **	−0.3905	0.0634 ***	−0.8142***
	(2.46)	(−0.78)	(3.01)	(−2.74)
Obs.	328	328	702	702
Adjusted R^2	0.0189	0.0190	0.0688	0.0581
F-stat	1.63	1.63	6.18	5.33
p-Value	(0.0972)	(0.0963)	(0.0000)	(0.0000)

Notes: A firm belongs to group 0 if it is ultimately controlled by a private family and to group 1 if it is ultimately controlled by the government.
* Statistically significant at the 0.10 level.
** Statistically significant at the 0.05 level.
*** Statistically significant at the 0.01 level.

preferential lending policy exercised by the country's government-controlled banks. However, this weakens the potential relationship between debt and the disclosure level.

The roles of assets-in-place and liquidity are not very significant in either group when tested separately. Ownership diffusion, measured by Avershare, is significantly positive for privately controlled firms, whereas no significant relationship is found in government-controlled firms. This result is consistent with monitoring theory. When the government takes primary responsibility for monitoring state-owned firms, ownership diffusion becomes less important.

Auditor type remains negatively and significantly related to the disclosure level, whereas the proportion of non-executive directors on the board remain in significant in both regressions. It is a not very surprising that I&L becomes in significant for privately controlled firms, and no existing theory provides a satisfactory explanation. The coefficient of state ownership in the regression on the private subgroup is −0.0152 (−0.2101) and highly significant ($p < 0.1$). The same coefficient in the general regression on the government group is 0.0092 and significant at the 0.1 level, whereas in the industry-adjusted regression on this group, it is 0.0948, which is less significant than that in the general regression. This finding further verifies our conjecture in Section 4.2.2 that the type of ultimate controller explains the quadratic association between state ownership and the disclosure level, at least in part.

5. Cost of equity

Establishing the relationship between the cost of equity and voluntary disclosure affords a deeper understanding of the economic consequences of such disclosure. To determine this critical relationship, we perform the following OLS regression.

$$\text{Cost} = \beta_0 + \beta_1 \text{Adj-DSCORE} + \beta_2 \text{LA} + \beta_3 \text{D/E} + \beta_4 \text{Beta} + \beta_5 \text{ROA} + \beta_6 \text{Analyst} + e$$

where LA is the natural log of the book value of total assets; D/E is the market value of debt divided by equity; Beta is the beta value in the past 100 days; ROA is return on assets; and Analyst is the number of analysts following the firm.

Table 7
Regression results for the cost of equity model.

Variable	General regression	adjusted for industry cluster
Adj-DSCORE	−0.0006	−0.0006
	(−0.20)	(−0.23)
LA	0.0124***	0.0124***
	(10.31)	(6.11)
D/E	−0.0006	−0.0006
	(−0.44)	(−0.24)
Beta	0.0073*	0.0073
	(1.82)	(1.49)
Analyst	−0.0015***	−0.0015***
	(−8.53)	(−5.38)
ROA	−0.0591***	−0.0591**
	(−3.15)	(−2.66)
Constant	−0.2210***	−0.2210***
	(−8.03)	(−5.86)
Control industry	Yes	Yes
Obs.	760	760
Adjusted R^2	0.3400	0.3621
F-stat	16.10	
p-Value	(0.0000)	

* Statistically significant at the 0.10 level.
** Statistically significant at the 0.05 level.
*** Statistically significant at the 0.01 level.

It is possible that investors prefer the stocks of firms in a specific industry. The industry-adjusted disclosure score was thus employed in this equation to alleviate any industry influence on the cost of equity. LA and ROA are adopted to control for the effects of firm size and performance on the cost of equity, and the D/E ratio is used to measure the leverage risk of individual firms. These three factors are the same as those used by Wang et al. (2008). In addition to these firm-specific characteristics, we add two other factors in the regression: Beta and Analyst. Beta is a proxy for the relative market risk of individual firms, and Analyst represents the public attention paid to a firm. Both have been verified as relevant to the cost of equity (Botosan and Plumlee, 2002; Francis et al., 2008). We also control for industry effects using dummy variables. Table 7 reports the results of this regression analysis, including the general regression and standard errors adjusted for industry clustering.

The Wang et al. (2008) OLS model has very little explanatory power, whereas the adjusted R^2 in our test is 16.1%, which is suggestive of better explanatory power. Contrary to our hypothesis, the coefficient of Adj-DSCORE is not significant, which is consistent with the evidence in Wang et al. (2008) and suggests that investors in China do not rely too much on the voluntary disclosure information in annual reports. In other words, such information is not a credible predictor of stock price movements. LA, Beta, and Analyst, in contrast, all have significant explanatory power in our model. Our findings suggest that larger firms face a higher cost of equity, which is contrary to the findings of most studies. The coefficient of Beta is positive and marginally significant, whereas that of Analyst is negative and highly significantly related to the cost of capital.

6. Conclusion

This study investigates the determinants and features of voluntary disclosure among companies listed on the Chinese stock market. Using a sample representing more than 80% of all public companies in China, we find evidence that differs from the findings of previous studies employing smaller samples, indicating that the Chinese stock market has a number of distinct features in connection with voluntary disclosure.

In tests of the entire sample, we find that firm size, leverage, assets-in-place, ROE, and ownership diffusion are significantly associated with voluntary disclosure and that auditor type and the intermediary and legal environments are highly significantly associated with voluntary disclosure. The sign on auditor type does not conform to previous studies, suggesting a different situation in China. We also find a quadratic convex association between state ownership and disclosure level, which helps to explain the inclusive empirical evidence presented by Xiao et al. (2004) and Wang et al. (2008).

When subsamples are tested, many of the explanatory variables lose their significance in one or both groups. This disparity suggests a significant difference in firm characteristics and accounting policy preferences between government and privately controlled firms. More importantly, the signs of the coefficients of state ownership in these two regressions are in opposite directions. The disclosure level decreases with state ownership in the privately controlled subsample, but increases with it in the government-controlled subsample, revealing a clear quadratic relationship. Furthermore, voluntary disclosure exerts no significant influence on the cost of equity, which casts doubt on the relevance of the voluntary information disclosed in annual reports to investors' decisions in the Chinese context.

The findings of this study will help Chinese regulators to fine-tune the country's regulatory policies to better suit the needs of the market. For instance, both state-owned businesses with a lower proportion of state ownership and private businesses with a higher proportion of such ownership may require more regulation to guarantee transparency. The findings will also benefit investors by providing them with a better understanding of the credibility of the annual reports supplied by companies with certain characteristics. The irrelevance of voluntary disclosure to the cost of equity reveals several deficiencies in the Chinese stock market and points to the need for better regulation and reform.

These potential implications of our findings suggest the desirability of future research that further refines and broadens our analysis. Three limitations of the study are particularly worth mentioning. First, the study involved a one-year test. Although industry and ultimate controller biases are controlled for, it is possible that there are year-specific influences, particularly with regard to the cost of equity. Second, although most of our regression models are statistically significant, their range of adjusted *R*-squares suggests that other potential determinants of voluntary disclosure may exist. Finally, we focus on only one form of disclosure vehicle, the

annual report. Additional studies could be conducted to analyze other vehicles, such as quarterly reports and press releases.

What is the benefit of voluntary disclosure for Chinese firms? We posit two possible benefits for testing in further research: future seasoned equity offerings (SEOs) and a lower cost of equity in the future. First, as Chen and Wang (2007) report, Chinese listed firms prefer to issue additional shares after their initial public offering through SEOs. To attract investors for future SEOs, firms have the motivation to disclose more information than is mandatory. Second, although we are unable to find any evidence to indicate that voluntary disclosure affects the cost of equity in this study, the Chinese stock market is developing very quickly. As investors become more experienced, it is likely that firms engaging in more extensive voluntary disclosure will benefit in terms of a lower cost of equity in the future.

Acknowledgments

Appendix A

List of voluntary disclosure items

General information
1. Corporate history
2. Corporate structure
3. Statement of strategy and objectives: general
4. Statement of strategy and objectives: financial
5. Statement of strategy and objectives: marketing
6. Statement of strategy and objectives: social
7. Detailed strategic plan and barriers

Financial information
  (a) Macro economic analysis
8. Index of selling prices
9. Index of raw material prices
10. Impacts of environment, policy and law

  (b) Industry analysis
11. Industry trend analysis
12. Competitor analysis

  (c) Trend analysis
13. Discussion of industry trends: prior
14. Discussion of industry trends: future

  (d) Financial review data
15. Net profit
16. Gearing ratios
17. Current ratios
18. Return on equity
19. Other ratios
20. Increase in income

21. Increase in sales
22. Increase in net profits
23. Increase in ROA

(e) Analysis of financial performance
24. Analysis of why income has changed
25. Analysis of why sales have changed
26. Analysis of why costs have changed
27. Analysis of why gross profits have changed
28. Analysis of why gross margins have changed
29. Analysis of why net profits have changed
30. Analysis of why core business profits have changed
31. Analysis of why core business incomes have changed
32. Analysis of why core business costs have changed
33. Analysis of why income from other businesses has changed
34. Analysis of why non-operating income has changed
35. Analysis of why non-operating expenditures have changed
36. Analysis of why administrative costs have changed
37. Analysis of why operational costs have changed
38. Analysis of why financial costs have changed
39. Analysis of why interest income (or cost) has changed
40. Analysis of why inventories have changed
41. Analysis of why construction in process has changed
42. Analysis of why engineering materials have changed
43. Analysis of why accounts receivable have changed
44. Analysis of why accounts payable have changed
45. Analysis of why notes receivable have changed
46. Analysis of why other accounts receivable have changed
47. Analysis of why other accounts payable have changed
48. Analysis of why notes payable have changed
49. Analysis of why accounts payable in advance have changed
50. Analysis of why pre-paid accounts have changed
51. Analysis of why capital expenditures have changed
52. Analysis of why R&D expenditures have changed
53. Analysis of why return on investment has changed
54. Analysis of why market shares have changed
55. Analysis of why cash flows have changed
56. Analysis of why cash and cash equivalents have changed
57. Analysis of why currency assets have changed
58. Analysis of why intangible assets have changed
59. Analysis of why debts have changed
60. Analysis of why total assets have changed
61. Analysis of why debts due in one year have changed
62. Analysis of why fixed assets have changed
63. Analysis of why ROE has changed
64. Analysis of why long-term investment has changed
65. Analysis of why short-term investment has changed
66. Analysis of why taxes payable have changed
67. Analysis of why wages or welfare payable have changed
68. Analysis of why short-term debts have changed
69. Analysis of why long-term debts have changed

70. Analysis of why long-term deferred expenses have changed
71. Analysis of why accrued expenses have changed
72. Analysis of why long-term payables have changed

(f) Comments on financial performance
73. Comments on income ratios
74. Comments on gearing ratios
75. Comments on current ratios
76. Comments on other ratios

(g) Forecast information
77. Difference between last-period forecasts of revenue and actual revenue
78. Difference between last-period forecasts of costs and actual costs
79. Difference between last-period forecasts of sales and actual sales
80. Forecasts of the market value of stocks
81. Forecasts of cash flows
82. Forecasts of capital expenditures
83. Forecasts of returns on R&D expenditures
84. Forecasts of revenue
85. Forecasts of sales
86. Forecasts of revenues from main business
87. Forecasts of costs
88. Forecasts of product quantities
89. Forecasts of profits
90. Effects of future opportunities on sales and profits
91. Effects of future risks on sales and profits

Non-financial information
  (a) Analysis of products and markets
92. Discussion of product development
93. Description of marketing network: domestic
94. Description of marketing network: foreign

  (b) Business issues
95. Description of business issues
96. Description of plans to resolve issues
97. Description of consequences of issues
98. Comments on issues

  (c) Managerial information
99. Structure of the board of directors
100. General information about directors and senior managers
101. Work experience of directors and senior managers
102. Shares held by directors and senior managers
103. Pay packages of directors and senior managers
104. Description of reasons for board member changes

  (d) Shareholder information
105. Description of top-10 shareholders
106. Description of institutional shareholder relationship
107. Description of ultimate controllers
108. Description of other shareholders holding more than 10% of total shares

(e) Analysis of capital market
109. Description of IPO
110. Description of year-end market value
111. Analysis of fluctuation in stock prices
112. Analysis of changes in dividend policy

(f) Analysis of employees
113. General information about employees
114. Employee training and welfare
115. Description of safety issues and costs

(g) Others
116. Description of important matters concerning guarantees
117. Description of investment performance and comments on any changes
118. Description of utilization of raised funds
119. Description of utilization of non-raised funds

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Accrual components and stock trading costs [☆]

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ABSTRACT

This paper examines the relationship between accrual components and stock trading costs in China and finds that both abnormal and normal accruals are associated with these costs. Moreover, negative accruals, both abnormal and normal, have a greater influence on stock trading costs than positive accruals because of short-selling constraints in the Chinese stock market. Further analysis reveals that investors who are fixated on accruals are unable to separate positive or negative abnormal accruals from earnings in general. Additionally, investors overestimate the persistence of both positive and negative normal accruals. These findings constitute further evidence of the low degree of market efficiency in China. Chinese investors seem to overestimate firm value when abnormal and normal accruals are positive and underestimate it when they are negative, thus leading to an asymmetric effect on trading costs between positive and negative accruals in the face of short-selling constraints in the Chinese stock market.

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1. Introduction

Trading cost savings are conducive to the efficient allocation of capital in economic systems. Biais et al. (2005) argue that the volume of transactions renders the overall economic system non-trivial, although the trading cost involved in each transaction is small. The issue of trading cost savings is particularly significant in China because of its speculative stock market and high stock turnover rate. Such savings are also conducive to investment returns. Korajczyk and Sadka (2004) evaluate the performance of momentum trading

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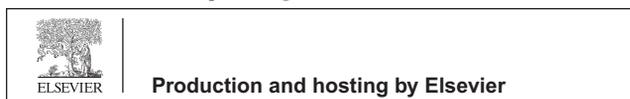
strategies with proportional transaction costs and find that the return net of effective spread (quoted spread) is 0.0061 (0.0054) in an equal-weighted momentum strategy, about 76.25% (67.50%) of the raw return (0.0080).

The issue of whether the mispricing of accruals is costly to investors is of significant importance to academics, practitioners, and regulators. Accruals provide investors with information on firm value, and their use can alter the timing of cash flow recognition in earnings, thereby mitigating the problem of noisy cash flow measurement and improving the accuracy of firm performance measurement, particularly when the interval of the latter measurement is short, the volatility of the firm's working capital requirements and investment and financing activities is great, and its operating cycle is long (Dechow, 1994). Some evidence suggests that investors have difficulty understanding the real firm value information embedded in accruals (Sloan, 1996; Xie, 2001; Richardson et al., 2005), which can increase stock trading costs because of information asymmetry between informed and uninformed traders.

Several papers discuss the relationship between accrual quality and the bid-ask spread, but few consider that between accrual components and stock trading costs. In addition, there is little research on the effects of normal accruals on stock trading costs or those of short-selling constraints on the relationship between abnormal and normal accruals and these trading costs. Using A-share listed firms on Chinese stock exchanges between 2004 and 2011, this paper empirically examines the relationship between accrual components and stock trading costs in the face of short-selling constraints. The results show that (1) both abnormal and normal accruals are associated with stock trading costs and (2) that negative abnormal and normal accruals have stronger effects on these costs than positive abnormal and normal accruals. This paper contributes to the literature by showing how short-selling constraints affect the relationship between accruals and stock trading costs.

The results of this paper also have several implications for accounting theory. First, accounting is an information and measurement system that identifies, records, and communicates relevant, reliable, and comparable information about an organization's real business activities (Ge, 2003). Many papers investigate the quality of earnings in terms of their relevance, reliability, and comparability, but few document the real accounting goal of reflecting an organization's real business activities. The results reported in this paper indicate that trading costs in the securities market increase if investors cannot understand an organization's real business activities (such as normal accruals). Second, in accrual-based accounting, accruals include numerous subjective judgments and measurement errors. This paper provides empirical evidence showing that investors' estimation of firm value is biased by accrual measurement errors. Third, it also offers empirical evidence to show that the full disclosure suggested by the information perspective, regardless of the disclosure form, is limited under weak-form stock market efficiency. Both the information and measurement perspectives should be considered when examining accounting information.

This paper also has implications for securities regulation. For example, listed firms in China need to strengthen their disclosure quality (e.g., by providing information on measurement methods and fundamental earnings conditions) because of the country's low degree of market efficiency. Doing so will reduce the information asymmetry between informed and uninformed investors and lower stock market trading costs.

The remainder of the paper is organized as follows.: Section 2 reviews the relevant literature. Section 3 presents the relevant background and posits hypotheses on the effects of accrual components on stock trading costs. The research design is discussed in Section 4. Section 5 presents the empirical results. Section 6 reports the results of additional analyses and robustness tests, and Section 7 concludes the paper.

2. Literature review

2.1. Literature on accrual mispricing

A number of studies present evidence to show that investors are naïve and do not use the information available correctly in forecasting future firm performance (e.g., Bernard and Thomas, 1990; Maines and Hand, 1996). Recent studies provide further empirical evidence of investors' naïve fixation on reported earnings by identifying the role of the information in the accrual components of current earnings in future earnings forecasts. This evidence indicates that investors are unable to fully capture the information contained in var-

ious accrual metrics and components (Sloan, 1996; Xie, 2001; Richardson et al., 2005). Sloan (1996) reports an accrual anomaly in the stock market, presenting evidence showing that stock prices place too great a weight on accruals. Drawing on Mishkin (1983) and the hedge-portfolio test methods in Sloan (1996), Xie (2001) finds the market to overestimate the persistence, or one-year-ahead earnings implications, of abnormal accruals, consequently overpricing them. Richardson et al. (2005) extend Sloan (1996) work by linking accrual reliability to earnings persistence. They show that less reliable accruals lead to less earnings persistence and that investors do not fully anticipate this lower degree of persistence, which leads to significant security mispricing. Chan et al. (2006) also investigate the market mispricing of accruals, finding that the mispricing of inventory accruals is most serious of all accrual components. Examining the Chinese stock market, Zhang and Zhao (2008) find that Chinese investors also misprice less reliable accruals. Using the methods of Fama–MacBeth, Song and Li (2009) find that there is also an accrual anomaly in this stock market, although the mispricing of earnings and earnings components are inconsistent with those in the US stock market.

2.2. Literature on accruals and stock trading costs

Accruals contain many subjective judgments, thus leading to information asymmetry between investors and listed firms. Endogenous information acquisition theories hold that the incentives to acquire and exploit private information are inversely related to the informativeness of public information (Grossman and Stiglitz, 1980; Verrecchia, 1982; Diamond, 1985; Baiman and Verrecchia, 1996; Easley and O'Hara, 2004). The relationship between trading costs and accrual components depends on the extent to which accruals contain measurement error and the degree to which investors are unable to correctly interpret the fundamental earnings component.

Only a few papers examine the relationship between accruals and stock trading costs either directly or indirectly. Bhattacharya et al. (2008) demonstrate that poor earnings quality increases adverse selection risk, as manifested in trading costs, and reduces liquidity in financial markets. Both the innate and discretionary components of earnings quality contribute significantly to information asymmetry. Further, poor earnings quality exacerbates information asymmetry around earnings announcements, particularly for firms whose earnings represent the principal source of information available to market participants. Several papers investigate the economic consequences of earnings quality using the bid-ask spread and the price impact as dependent variables. Affleck-Graves et al. (2002), for example, explore the relationship among earnings predictability, information asymmetry, and the behavior of the adverse selection cost component of the bid-ask spread around the quarterly earnings announcements of NASDAQ firms. They find an increase in this component on the day of and day prior to these announcements for firms with less predictable earnings. However, they find no evidence of such a change among firms with more predictable earnings. Jayaraman (2008) reports that bid-ask spreads and the probability of informed trading are higher both when earnings are smoother than cash flows and when they are more volatile than cash flows. His additional tests suggest that managers' discretionary choices lead to smoother or more volatile earnings to a greater extent than cash flows garble information, although their non-discretionary choices do not. Lang et al. (2012) document lower transaction costs and greater liquidity for firms with greater transparency, and find that the transparency–liquidity relationship is more pronounced when overall investor uncertainty is greater.

3. Institutional background and hypothesis development

Dechow et al. (2010) show that reported accrual-based earnings are a function of unobservable fundamental earnings and the accounting measurement error term. Fundamental earnings, alternatively referred to as perpetual earnings, can be thought of as the expected cash flows generated during a period that can be annuitized to obtain the fundamental value of the firm. The error term represents the ability of the accounting system to measure the firm's fundamental earnings process. Similarly, the accrual component of earnings also contains two components: fundamental accruals and error accruals.

Abnormal accruals are an important type of accounting measurement error. Some researchers argue that managers communicate private information using abnormal accruals. Subramanyam (1996), for example, uses the modified Jones model to measure abnormal accruals and finds them to have incremental information con-

tent. He interprets this finding as evidence that abnormal accruals are not opportunistic, but rather communicate private information on equity value. However, most work in this arena reports that managers use abnormal accruals to manage earnings for their own private benefit, thereby increasing the firm's agency costs (Francis et al., 1999) and the degree of information asymmetry between investors. Abnormal accruals in China, in particular, appear to be opportunistic owing to the country's weak investor protection and special institutional arrangements (such as IPOs, SEOs, and ST). Wang and Lian (2010), for example, document significant abnormal accrual increases after China implemented a sponsor system, and Zhang (2010) finds evidence of earnings management before private offerings. He finds that the type of earnings management is related to the type of private offering. Zhang and Hu (2008) report that loss-making firms are more likely to take "a big bath" in fourth-quarter financial statements. Lei and Liu (2007) empirically test the relationship between controlling shareholders' tunneling behavior and negative earnings management when firms experience a loss in their first year. They find that negative earnings management is serious when controlling shareholders occupy funds. Overall, abnormal accruals are opportunistic in China, which garbles information. Investors cannot correctly price obscure abnormal accruals if they are naïve and fixated on earnings (Xie, 2001), thereby leading to severe information asymmetry between informed and uninformed investors.

However, the accrual anomaly identified by Sloan (1996) cannot be explained by the mispricing of abnormal accruals alone. Normal accruals (non-discretionary accruals) can also be mispriced (Thomas and Zhang, 2002; Bradshaw et al., 2001). Chan et al. (2006) highlights two possible interpretations of the mispricing of normal accruals. First, the psychology perspective suggests that individuals extrapolate past trends from short histories too far into the future (Shleifer, 2000). For example, analysts and investors tend to weigh past growth too heavily in their forecasts and valuations (e.g., De Bondt and Thaler, 1990; Chan et al., 2003). Normal accruals (non-discretionary accruals) capture the influence of business conditions (Chan et al., 2006) and reflect changes in firms' net assets (Fairfield et al., 2003; Zhang, 2007). A high (low) level of normal accruals may be a reflection of strong (weak) past sales growth and investors wrongly infer that such high (low) growth trends will last for a long time. Second, the behavioral finance perspective suggests that individuals may be too slow in updating their beliefs when new evidence arrives (Edwards, 1968). A high level of normal accruals makes a firm look good even when it is facing difficulties in its operating conditions. If investors cannot extrapolate a firm's operating conditions from the components of accruals, such as changes in inventories, receivables, and payables, then the mispricing of normal accruals is likely to occur.

If investors are naïve and fixated on earnings, they generally cannot understand the real value or relevance of the information embedded in accrual components (whether abnormal or normal). However, not all investors are naïve. Some are able to acquire information before others and grasp the implications of public news (Lakonishok et al., 1992; Hand, 1990). For example, institutional investors are more sophisticated than individual investors and have a stronger capacity to acquire and process information (Grinblatt and Titman, 1989; Nofsinger and Sias, 1999; Wermers, 2000). Therefore, these informed investors are likely to be able to correctly price abnormal and normal accruals, thus leading to information asymmetry with their less sophisticated counterparts. This informed trading by informed investors increases stock trading costs.

A high absolute value of abnormal accruals generally means high levels of earnings management and information asymmetry, which lead to high trading costs. Similarly, a high absolute value of normal accruals generally means that firms are experiencing a high or low rate of growth, which renders it easy for investors to misestimate the tendency of earnings performance to reverse.

Accordingly, the first set of hypotheses areis as follows.

H1a. A higher absolute value of abnormal accruals is associated with a higher stock trading cost.

H1b. A higher absolute value of normal accruals is associated with a higher stock trading cost.

Contrary to the case in the US, short-selling is constrained in the Chinese stock market. Informed investors may thus engage in different forms of arbitrage depending on whether firm value is underestimated or overestimated. When it is underestimated, these investors can benefit from buying the firm's stocks. When it is overestimated, in contrast, they are unable to benefit from short-selling in the Chinese stock market because of short-selling constraints (Jin, 2010). Hence, more informed trading takes place when firm value is underestimated, which leads to higher stock trading costs.

The sign of abnormal accruals can be positive or negative because managers can manage earnings upward or downward. Informed investors in China are unable to benefit from positive abnormal accruals because of short-selling constraints, thus leading to less active informed trading. The stock trading costs incurred by adverse selection risk are low in this case. However, when abnormal accruals are negative, firm value is under-estimated. Informed investors can benefit from buying these firms' stocks, which leads to losses for unin-formed investors.

Similarly, there are positive and negative normal accruals. Firm may be enjoying sales growth when normal accruals are positive, meaning that investors may overestimate the persistence of that growth and, accordingly, overestimate firm value (Chan et al., 2006). When these accruals are negative, in contrast, firms may be experiencing weak sales growth, meaning that investors may overestimate the persistence of such weak growth and, accordingly, underestimate firm value. Hence, negative normal accruals attract more informed trading, leading to higher stock trading costs.

The second set of hypotheses areis thus as follows.

H2a. In the short- selling-constrained Chinese stock market, negative abnormal accruals have a greater influence on stock trading costs than positive abnormal accruals.

H2b. In the short- selling-constrained Chinese stock market, negative normal accruals have a greater influence on stock trading costs than positive normal accruals.

4. Sample selection and research design

4.1. Sample selection

The initial sample comprises all A-share firms listed on the Shanghai and Shenzhen Stock Exchanges from 2004 to 2008 according to data from the China Stock Market and Accounting Research (CSMAR) database. The sample initially included 1746 firms and 7295 observations. After eliminating 87 financial industry obser-vations, 370 IPO observations, and 358 observations with missing variables, the final sample contains 6480 firm-year observations. Following Jiang et al. (2010), all variables are winsorized at the 1% and 99% levels.

The stock return data in this paper are from the CSMAR database. Financial data are from the CSMAR and WIND databases, and high-frequency data from the China Center for Economic Research (CCER) database.

4.2. Measurement of trading costs

Trading costs constitute one measure of liquidity. If brokerage fees and transfer taxes are excluded, there are two kinds of trading costs (Korajczyk and Sadka, 2004): proportional (quoted and effective spreads) and non-proportional (price impact). Proportional trading costs are independent of the size of the portfolio traded, whereas non-proportional costs increase with the size of the portfolio.

Spreads are a more suitable measure of trading costs in the Chinese context because of the country's low degree of institutional ownership. Most trades are initiated by individual investors and are small in scale. Zhang and Liu (2006) argue that spreads can be a direct measure of trading costs when investors make small trades, although both the Shenzhen and Shanghai Stock Exchanges are electronic, order-driven exchanges. He and Niu (2009) also suggest that spreads are a typical metric of trading costs, which affect investors' invest-ment returns. This paper therefore uses quoted and effective spreads to measure trading costs in the Chinese stock market. High-frequency data are used to construct these spreads, as follows.

$$QSP_i = \frac{1}{D_i} \sum_{d=1}^{D} \frac{1}{T} \sum_{t=1}^{T} \frac{Ask_{i,t} - Bid_{i,t}}{(Ask_{i,t} + Bid_{i,t})/2} \tag{1}$$

$$ESP_i = \frac{1}{D_i} \sum_{d=1}^{D} \frac{1}{T} \sum_{t=1}^{T} 2 \times \frac{|\text{Price}_{i,t} - (Ask_{i,t} + Bid_{i,t})/2|}{(Ask_{i,t} + Bid_{i,t})/2} \tag{2}$$

where D_i is the number of trading days in the year for stock i; $Bid_{i,t}$ is the highest bid price for stock i at time t; $Ask_{i,t}$ is the lowest ask price for stock i at time t; T is the number of transactions in a day for stock i; and $Price_{i,t}$ is the price of stock i at time t.

The daily spread is first calculated as the average intraday spread. QSP and ESP are the averages of the daily spreads (quoted and effective spreads) by year. To compute the quoted and effective spreads more effectively and accurately, high-frequency data are first selected according to several Chinese institutional features: (1) trades in the call auction period are excluded because of the different character of call and continuous auctions and (2) trades that hit up or down limits are excluded because the spreads of these trades are abnormal, and (3) trades that seem to be incorrectly recorded, such as those for which the highest bid price is larger than the lowest ask price or for which the lowest ask price is negative, are excluded.

Moreover, financial reporting for year t must be provided before April 30 of the next year in China. Therefore, trades made between May 1 of year t and April 30 of year $t + 1$ are used to calculate the spreads for year t.

4.3. Measurement of abnormal and normal accruals

Dechow et al. (1995) find the modified Jones model to exhibit the greatest power in detecting earnings management. This model is thus used to obtain abnormal and normal accruals in this paper. Model (3) is estimated for each year-industry in the sample, and the abnormal accruals in model (4) are then calculated for each firm-year in the sample using the coefficients estimated in model (3).

$$\frac{TA_{i,t}}{Asset_{i,t-1}} = a_1 \frac{1}{Asset_{i,t-1}} + a_2 \frac{\Delta REV_{i,t}}{Asset_{i,t-1}} + a_3 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \varepsilon_{i,t} \tag{3}$$

$$Abacc_{i,t} = \frac{TA_{i,t}}{Asset_{i,t-1}} - \left(a_1 \frac{1}{Asset_{i,t-1}} + a_2 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{Asset_{i,t-1}} + a_3 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \varepsilon_{i,t} \right) \tag{4}$$

In models (3) and (4), TA is total accruals, which equal operating profits minus operating cash flow, Asset is total assets, ΔREV is changes in sales, ΔREC is changes in receivables, and PPE is gross fixed assets.

4.4. Regression models

The following multivariate regressions are used to test the hypotheses.

$$\begin{aligned} Tradingcost = {} & \beta_0 + \beta_1 Accrual + \beta_2 Size + \beta_3 Price + \beta_4 Volatility + \beta_5 Volume + \beta_6 State + Year \\ & + Industry + \varepsilon \end{aligned} \tag{5}$$

$$\begin{aligned} Tradingcost = {} & \beta_0 + \beta_1 |abacc| + \beta_2 Dum1 + \beta_3 |abacc| * Dum1 + \beta_4 Size + \beta_5 Price + \beta_6 Volatility \\ & + \beta_7 Volume + \beta_8 State + Year + Industry + \varepsilon \end{aligned} \tag{6}$$

$$\begin{aligned} Tradingcost = {} & \beta_0 + \beta_1 |noracc| + \beta_2 Dum2 + \beta_3 |noracc| * Dum2 + \beta_4 Size + \beta_5 \text{Price} + \beta_6 Volatility \\ & + \beta_7 Volume + \beta_8 State + Year + Industry + \varepsilon \end{aligned} \tag{7}$$

In the regressions, $Tradingcost$ is the stock trading cost, which equals the natural logarithm of QSP and ESP; $Accrual$ is the components of accruals, which is equal to the absolute value of abnormal accruals ($|abacc|$) or normal accruals ($|noracc|$). On the basis of the foregoing analysis, the sign of $Accrual$ is predicted to be positive in Eq. (5). Eqs. (6) and (7) examine the influence of short-selling constraints in the Chinese stock market on the relationship between accrual components and stock trading costs. $Dum1$ and $Dum2$ are dummy variables. When $abacc$ is negative, $Dum1$ is 1, and otherwise 0. Similarly, when $noracc$ is negative, $Dum2$ is 1, and otherwise 0. As previously noted, when normal and abnormal accruals are positive, there is little informed trading by investors because of short-selling constraints. When they are negative, in contrast, more informed trading takes place. Therefore, negative abnormal and normal accruals exert a greater influence on stock trading costs than positive abnormal accruals. Thus, the coefficients on $|abacc| * Dum1$ and $|noracc| * Dum2$ are expected to be positive.

Table 1
Variable definitions.

Dependent variable	
Tradingcost	Stock trading cost = natural logarithm of QSP and ESP, which are calculated according to Eqs. (1) and (2)
Independent variables	
Abacc	Abnormal accruals, calculated according to Eq. (4)
|abacc|	The absolute value of abnormal accruals.
Noracc	Normal accruals, calculated according to Eq. (3)
|noracc|	The absolute value of normal accruals
*Dum*1	Dummy variable; when *abacc* is negative, *Dum1* is 1, otherwise 0
*Dum*2	Dummy variable; when *noracc* is negative, *Dum2* is 1, otherwise 0
Control variables	
Size	Firm size = natural logarithm of total assets
Price	Stock price = average stock price in the year
Volatility	Return volatility = standard deviation of stock returns in the year
Volume	Stock trading volume = natural logarithm of average trading volume in the year
State	Dummy variable; when the firm is state-owned, State is 1, otherwise 0
Year	Year fixed effects
Industry	Industry fixed effects

Prior research (e.g., Lang and Lundholm, 1993) shows a positive relationship between firm size and disclosure. Large firms attract more analysts than their smaller counterparts. Larger firms also feature a higher degree of information transparency, less severe information asymmetry, and lower trading costs. The coefficient on *Size* is therefore expected be negative. Venkatesh and Chiang (1986) document more severe information asymmetry in firms with a low stock price than in those with a high stock price. Hence, the coefficient of *Price* is expected to be negative. Moreover, firms with greater volatility face a higher market risk (Kanagaretnam et al., 2007), suggesting a positive coefficient for *Volatility*. Firms with a large trading volume have a higher level of liquidity, and thus, the predicted coefficient of *Volume* is negative. The dummy variable *State* is included to capture the difference in properties between state-owned enterprises (SOEs) and non-SOEs in China. Year and industry fixed effects are also included in the multivariate regressions.

Table 1 is the variable definitions.

5. Empirical results

Table 2 presents the summary statistics of the variables. QSP and ESP are about 0.3% in China, similar to the values calculated by Chung et al. (2010), who report an average quoted spread (effective spread) of 0.36% (0.26%) for their NYSE/AMEX sample and 2.17% (1.54%) for their NASDAQ sample. The spreads in China are much lower than those in the NASDAQ stock market, suggesting that they are lower in an order-driven

Table 2
Summary statistics.

Variables	N	Mean	Median	Std.	Min	Max	p25	p75
QSP	6480	0.0028	0.0026	0.0011	0.0010	0.0067	0.0019	0.0033
ESP	6480	0.0028	0.0027	0.0011	0.0011	0.0069	0.0020	0.0033
Abacc	6480	−0.0060	−0.0008	0.1080	−0.4081	0.3375	−0.0517	0.0460
|abacc|	6480	0.0742	0.0488	0.0788	0.0000	0.4081	0.0216	0.0964
Noracc	6480	−0.0151	−0.0220	0.0720	−0.1874	0.4363	−0.0459	0.0014
|noracc|	6480	0.0449	0.0311	0.0583	0.0000	0.4363	0.0141	0.0544
Size	6480	21.3690	21.2917	1.0757	18.8266	24.6572	20.6479	22.0085
Price	6480	9.0480	6.9313	7.0346	2.1112	42.7328	4.7560	10.6374
Volatility	6480	0.0340	0.0327	0.0096	0.0164	0.0575	0.0261	0.0417
Volume	6480	14.8160	14.8097	1.0788	12.3699	17.4565	14.0146	15.5902
State	6480	0.6662	1.0000	0.4716	0.0000	1.0000	0.0000	1.0000

market than in a quote-driven market. The mean (variance) of |abacc| is 0.0742 (0.0788), and its maximum and minimum values are 0.4081 and 0.0000, respectively, suggesting that the sample firms have very different levels of earnings management. The sign of the mean of abnormal accruals, *abacc*, is negative, which suggests that downward earnings management is widespread among Chinese listed firms.

The summary results for the control variables are as follows:. The mean of stock price is 9.0480, which is far less than that in the US. The mean of stock volatility is 0.0340, which is higher than that among NYSE/AMEX firms (0.0239) but lower than that among NASDAQ firms (0.0460) (Chung et al., 2010). The reason for the discrepancy may be the entrepreneurial nature of many firms listed on the NASDAQ, as such firms face higher risks. The mean of *State* is 0.6662, suggesting that more than half the sample firms are state-owned.

Table 3 presents the Pearson (bottom)/Spearman (top) correlations between variables. The Pearson correlation between spreads and the absolute value of abnormal accruals is significantly positive at the 1% level. The Spearman correction between spreads and the absolute value of normal accruals is also significantly positive at the 1% level. The correlations between spreads and *Size*, *Price* and *Volume* are negative, which is consistent with expectations. Surprisingly, however, those between spreads and *Volatility* are negative, contrary to expectations.

Table 4 presents the results of a grouping test. Sample firms are considered high absolute value firms if their absolute value of normal (abnormal) accruals areis higher than the median, and otherwise as low absolute value firms. The trading costs between the high and low absolute value subsamples are then compared. Consistent with expectations, QSP and ESP are significantly higher in the former, as shown in Table 4.

Table 5 presents the results of the regressions of abnormal and normal accruals on trading costs. The coefficients on |abacc| and |noracc| are significantly positive at the 1% level, which suggests that both abnormal and normal accruals increase spreads in the Chinese stock market. Among the control variables, the coefficients on *Size* are significantly negative, consistent with expectations, indicating that larger firms have less information asymmetry and lower spreads. Those on *Price* are also significantly negative, also consistent with expectations, which suggests that firms with a higher stock price have less information asymmetry and lower spreads. The coefficients on *Volume*, too, are significantly negative, suggesting that a higher trading volume can reduce spreads. Interestingly, and contrary to expectations, the coefficients on *Volatility* are negative, perhaps because investors are able to obtain more information from highly volatile firms.

Table 3
Pearson (bottom)/spearman (top) correlations between variables.

Variables	QSP	ESP	|abacc|	|noracc|	Size	Price	Volatility	Volume	State
QSP	1	0.9861 (<0.001)	0.0156 (0.209)	0.0559 (<0.001)	−0.4356 (<0.001)	−0.6202 (<0.001)	−0.4047 (<0.001)	−0.6416 (<0.001)	−0.0828 (<0.001)
ESP	0.9720 (<0.001)	1	0.0225 (0.070)	0.0560 (<0.001)	−0.4339 (<0.001)	−0.6089 (<0.001)	−0.3534 (<0.001)	−0.5959 (<0.001)	−0.0843 (<0.001)
|abacc|	0.0491 (<0.001)	0.0568 (<0.001)	1	0.148 (<0.001)	−0.0666 (<0.001)	0.0412 (<0.001)	0.119 (<0.001)	0.0266 (0.032)	−0.0816 (<0.001)
|noracc|	0.0134 (0.281)	0.0203 (0.103)	0.4314 (<0.001)	1	0.0713 (<0.001)	−0.1297 (<0.001)	0.0193 (0.121)	0.0551 (<0.001)	0.029 (0.019)
Size	−0.4485 (<0.001)	−0.4387 (<0.001)	−0.0672 (<0.001)	0.0519 (<0.001)	1	0.1895 (<0.001)	−0.0124 (0.319)	0.466 (<0.001)	0.2677 (<0.001)
Price	−0.4183 (<0.001)	−0.4021 (<0.001)	0.0677 (<0.001)	−0.0284 (0.022)	0.2256 (<0.001)	1	0.4182 (<0.001)	0.1599 (<0.001)	−0.0209 (0.093)
Volatility	−0.3732 (<0.001)	−0.3209 (<0.001)	0.1446 (<0.001)	0.1349 (<0.001)	−0.0081 (0.513)	0.3257 (<0.001)	1	0.5431 (<0.001)	−0.0797 (<0.001)
Volume	−0.6174 (<0.001)	−0.5606 (<0.001)	0.0287 (0.021)	0.0784 (<0.001)	0.5007 (<0.001)	0.0901 (<0.001)	0.5179 (<0.001)	1	0.0857 (<0.001)
State	−0.0867 (<0.001)	−0.086 (<0.001)	−0.0947 (<0.001)	−0.0302 (0.015)	0.2747 (<0.001)	−0.0194 (0.118)	−0.0779 (<0.001)	0.0929 (<0.001)	1

Table 4
Grouping test results.

	High	Low	Difference (*t*-test)
Panel A: grouping according to |abacc|			
QSP	0.0027823	0.0027326	0.0000497[*]
ESP	0.0028372	0.0027821	0.000055[**]
N	3240	3240	
Panel B: grouping according to |noracc|			
QSP	0.0028017	0.0027132	0.0000885[***]
ESP	0.0028473	0.0027719	0.0000754[***]
N	3240	3240	

[***] Indicate significance at the 1% level.
[**] Indicate significance at the 5% level.
[*] Indicate significance at the 10% level.

Table 5
Regressions of abnormal and normal accruals on stock trading costs.

Variables	lnQSP	lnQSP	lnQSP	lnESP	lnESP	lnESP
|abacc|	0.3240[***]		0.2660[***]	0.3210[***]		0.2670[***]
	(7.85)		(5.98)	(7.79)		(5.95)
|noracc|		0.3590[***]	0.2200[***]		0.3460[***]	0.2070[***]
		(6.84)	(3.89)		(6.80)	(3.73)
Size	−0.0476[***]	−0.0508[***]	−0.0486[***]	−0.0441[***]	−0.0473[***]	−0.0451[***]
	(−10.48)	(−11.13)	(−10.66)	(−9.68)	(−10.31)	(−9.85)
Price	−0.0217[***]	−0.0212[***]	−0.0215[***]	−0.0208[***]	−0.0204[***]	−0.0207[***]
	(−27.02)	(−26.48)	(−26.76)	(−26.87)	(−26.30)	(−26.59)
Volatility	−2.2740[***]	−2.0450[***]	−2.3050[***]	−1.2690[*]	−1.038	−1.2990[**]
	(−3.43)	(−3.08)	(−3.48)	(−1.93)	(−1.57)	(−1.99)
Volume	−0.1730[***]	−0.1710[***]	−0.1720[***]	−0.1580[***]	−0.1560[***]	−0.1570[***]
	(−28.62)	(−28.31)	(−28.53)	(−26.59)	(−26.29)	(−26.51)
State	−0.0044	−0.0059	−0.0043	−0.0011	−0.0027	−0.0010
	(−0.65)	(−0.90)	(−0.65)	(−0.60)	(−0.40)	(−0.15)
Year	Control	Control	Control	Control	Control	Control
Industry	Control	Control	Control	Control	Control	Control
Constant	−2.1360[***]	−2.0800[***]	−2.1210[***]	−2.4640[***]	−2.4090[***]	−2.4500[***]
	(−26.93)	(−26.14)	(−26.63)	(−31.10)	(−30.27)	(−30.78)
N	6480	6480	6480	6480	6480	6480
Adj_R2	0.642	0.641	0.643	0.575	0.573	0.575
F	518.4	513.1	496.9	350.5	345.8	335.4

The *t*-values in parentheses are based on White's (1980) adjustment for heteroskedasticity.
[***] Denote statistical significance at the 1% level.
[**] Denote statistical significance at the 5% level.
[*] Denote statistical significance at the 10% level.

As previously discussed, investors overestimate firm value when abnormal and normal accruals are positive. Stock trading costs are less influenced by positive accruals because informed investors cannot benefit from short-selling in China. When abnormal and normal accruals are negative, in contrast, investors underestimate firm value, meaning that informed investors are likely to buy stock. In this case, uninformed investors face an adverse selection risk. Spreads are increased to protect them, thus leading to higher trading costs. Table 6 presents empirical evidence to support this argument. For the sake of brevity, QSP (in log) is used as the dependent variable in these regression models, although the conclusions are the same when the dependent variable is ESP (in log). Models (1) and (4) in Table 6 are regressions of negative abnormal and normal accruals on stock trading costs. The coefficients on both |abacc| and |noracc| are positive. Models (2) and (5) are regressions of positive abnormal and normal accruals on stock trading costs. The coefficient on |abacc| is not significant, whereas that on |noracc| is significantly positive. Models (3) and (6) are regressions with the interaction vari-

Table 6
Regressions of short-selling constraints on the relationship between accruals and stock trading costs.

Variables	(1) lnQSP	(2) lnQSP	(3) lnQSP	(4) lnQSP	(5) lnQSP	(6) lnQSP
$|abacc|$	0.5350***	−0.0905	0.0051			
	(10.03)	(−1.44)	(0.08)			
$Dum1$			0.0257***			
			(3.17)			
$|abacc|*Dum1$			0.4930***			
			(6.18)			
$|noracc|$				0.7180***	0.2450***	0.2070***
				(6.56)	(3.71)	(3.79)
$Dum2$						−0.0213**
						(−2.46)
$|noracc|*Dum2$						0.6010***
						(5.13)
Size	−0.0637***	−0.0276***	−0.0477***	−0.0439***	−0.0539***	−0.0503***
	(−10.26)	(−4.28)	(−10.67)	(−8.13)	(−6.64)	(−11.01)
Price	−0.0218***	−0.0202***	−0.0204***	−0.0268***	−0.0153***	−0.0211***
	(−14.13)	(−22.08)	(−25.44)	(−20.99)	(−16.15)	(−26.23)
Volatility	−3.9440***	−1.3050	−2.7000***	−1.0500	−2.2350*	−1.9370***
	(−4.35)	(−1.35)	(−4.12)	(−1.30)	(−1.82)	(−2.92)
Volume	−0.1510***	−0.1960***	−0.1710***	−0.1610***	−0.2120***	−0.1720***
	(−18.34)	(−22.79)	(−28.71)	(−22.46)	(−20.80)	(−28.32)
State	0.0028	−0.0101	−0.0046	−0.0102	0.0054	−0.0064
	(0.31)	(−1.08)	(−0.70)	(−1.30)	(0.46)	(−0.97)
Year	Control	Control	Control	Control	Control	Control
Industry	Control	Control	Control	Control	Control	Control
Constant	−2.0690***	−2.2520***	−2.1640***	−2.3560***	−1.5100***	−2.0790***
	(−18.83)	(−20.94)	(−27.75)	(−25.00)	(−10.55)	(−26.11)
N	3262	3218	6480	4794	1686	6480
Adj_R2	0.658	0.645	0.65	0.621	0.709	0.642
F	283.3	272.7	495.5	325.4	201.9	471.9

The t-values within parentheses are based on White's (1980) adjustment for heteroskedasticity.
*** Denote statistical significance at the 1% level.
** Denote statistical significance at the 5% level.
* Denote statistical significance at the 10% level.

ables included. The coefficients on $|abacc|*Dum1$ and $|noracc|*Dum2$ are significantly positive at the 1% level, suggesting that negative accruals have a greater effect on trading costs than positive accruals. Interestingly, the coefficient on $|abacc|$ is not significant in Model (2), whereas that on $|noracc|$ is significantly positive in Model (5). A possible explanation is that some investors understand the value relevance of positive normal accruals and thus sell these stocks, leading to an increase in both information asymmetry and spreads. However, few investors understand the value relevance of positive abnormal accruals, thus the degree of information asymmetry between investors is low, and there is no significant change in spreads when these accruals increase.

6. Additional tests and robustness tests

6.1. Additional tests of Chinese stock market efficiency

As previously discussed, a low degree of market efficiency can lead to the mispricing of positive and negative abnormal accruals. If investors are naïve and fixated on earnings, they are likely to overestimate earnings with positive abnormal accruals and underestimate earnings with negative abnormal accruals. In this section, the results of market efficiency tests that distinguish positive or negative abnormal accruals from earnings in the Chinese stock market are reported. The full sample is split into two groups according to whether firms' abnormal accruals are negative or not. Each group is sorted by accounting earnings and decomposed into

30 small groups of equal size. In each of these 30 small groups, the observations are sorted by abnormal accruals and then split into two groups of the same size to ensure that there are no significant differences in earnings between the two groups but a significant difference in abnormal accruals. If no significant difference in market returns is found between the two groups, the implication is that investors in China are naïve, fixated on earnings, and unable to distinguish abnormal accruals from earnings. Table 7 presents the empirical results. Most of the t-values are insignificant, suggesting a low degree of market efficiency in China. The country's investors cannot distinguish abnormal accruals from earnings.

Weak market efficiency may also be associated with the mispricing of positive and negative normal accruals. Firms may be undergoing a growth period when these accruals are positive and investors may optimistically believe that the high rate of growth will last for a long time (Chan et al., 2006), leading to overestimation of firm value. Similarly, firms may be in financial difficulty when normal accruals are negative and investors may pessimistically believe that the difficulty will persist, leading to underestimation of firm value. Following Sloan (1996), the rational expectations model is used to test whether stock prices reflect the information on future earnings contained in positive and negative normal accruals. More specifically, Eqs. (8) and (9) are used to test the market mispricing of the persistence of positive and negative normal accruals. $Earnings_{t+1}$ is operating earnings in $t + 1$. $Cash$ is operating cash flow in year t. $Noracc^+ = Noracc$ if $Noracc > 0$, otherwise 0. $Noracc^- = Noracc$ if $Noracc < 0$, otherwise 0. AR_{t+1} is the buy- and-hold return from May 1 in year $t + 1$ to April 30 in year $t + 2$. If

Table 7
Market efficiency test distinguishing negative or positive abnormal accruals from earnings.

	$Abacc < 0$ Bhar			$Abacc \geqslant 0$ Bhar		
	Low	High	t-value	Low	High	t-value
group1	−0.2379	−0.2379	−0.79	0.0156	−0.1341	1.08
group2	−0.0889	−0.0195	−0.64	0.0867	−0.0637	1.05
group3	0.1427	0.1870	−0.25	0.1831	−0.0578	1.88*
group4	−0.0791	−0.1613	0.83	0.0158	0.1073	−0.71
group5	−0.0206	−0.0646	0.40	0.0908	0.2773	−1.17
group6	0.2218	−0.1005	2.57**	0.1819	0.0796	0.70
group7	0.0491	0.0075	0.35	0.1099	0.0393	0.53
group8	−0.1098	0.2307	−2.35**	0.0959	−0.0195	0.84
group9	0.1540	0.1878	−0.24	0.0733	−0.0472	0.96
group10	0.1008	0.1410	−0.29	0.0915	0.0822	0.07
group11	0.0659	−0.0378	0.89	0.0094	0.0335	−0.18
group12	0.0878	0.0564	0.24	0.0367	0.0916	−0.40
group13	0.3424	0.0350	1.81*	0.1729	−0.0578	2.10**
group14	−0.0675	0.0578	−1.13	−0.1072	0.1802	−2.25**
group15	0.1065	0.0552	0.42	0.1740	−0.1069	2.73***
group16	0.1162	0.1157	0.00	0.0351	0.2751	−1.70*
group17	0.4071	0.0870	1.79*	−0.0935	0.0813	−1.67*
group18	−0.0035	0.0950	−0.81	0.0554	0.1269	−0.58
group19	0.1743	0.1918	−0.14	−0.0304	0.0631	−0.78
group20	0.1724	0.1096	0.42	0.0838	−0.0532	1.08
group21	0.1145	−0.0117	1.11	0.1499	−0.0127	1.32
group22	−0.0080	−0.0469	0.35	0.1906	0.0600	0.89
group23	−0.0556	0.0470	−1.02	−0.0689	0.1524	−1.84*
group24	0.0489	0.1770	−1.17	0.0052	0.0681	−0.61
group25	0.1462	0.1203	0.21	0.0807	−0.0802	1.51
group26	0.1762	0.0367	1.07	−0.0031	0.2241	−1.80*
group27	0.1479	0.0988	0.37	0.1130	0.1403	−0.19
group28	0.1893	0.2098	−0.17	0.2623	0.3429	−0.43
group29	0.3696	0.0870	2.16**	0.0658	0.0523	0.11
group30	0.3256	0.1640	1.08	0.3044	0.2781	0.17

*** Denote statistical significance at the 1% level.
** Denote statistical significance at the 5% level.
* Denote statistical significance at the 10% level.

market efficiency is weak, investors cannot correctly price positive normal accruals, in which case β_3^* differs significantly from β_3, and β_4^* differs significantly from β_4. Investors overestimate the persistence of a firm's growth and sluggishness if β_3^* is significantly greater than β_3 and β_4^* is significantly greater than β_4.

$$Earnings_{t+1} = \beta_0 + \beta_1 Cash + \beta_2 Abacc + \beta_3 Noracc^+ + \beta_4 Noracc^- + \varepsilon \tag{8}$$

$$AR_{t+1} = \beta \left(Earnings_{t+1} - \beta_0^* - \beta_1^* Cash - \beta_2^* Abacc - \beta_3^* Noracc^+ - \beta_4^* Noracc^- \right) + \mu \tag{9}$$

Table 8 presents the results of the estimation of the market pricing of positive and negative normal accruals with respect to their implications for one-year-ahead earnings. Coefficient β_3^* is 1.2385, significantly greater than β_3, which is 0.5295, suggesting that investors overestimate the persistence of positive normal accruals. Similarly, coefficient β_4^* is 0.9346, significantly greater than β_4, which is 0.4876, suggesting that investors overestimate the persistence of negative normal accruals. Overall, investors overestimate the persistence of a firm's current operating conditions, thus leading to the mispricing of normal accruals.

6.2. Robustness tests

6.2.1. Results based on non-proportional trading costs (the price effect)

The empirical results reported thus far are based on proportional trading costs (quoted and effective spreads). As a robustness test, the relationship between accruals and non-proportional trading costs (the price effect) are also investigated. Following Amihud (2002) and Hasbrouck (2009), an illiquidity measure is used to estimate the price effect of trades:

$$Priceimpact = \frac{1}{D} \sum_{d=1}^{D} \sqrt{\frac{|R_d|}{RMBVOL_d}} \times 10^6 \tag{10}$$

D is the sum of days with nonzero volume from May 1 of year t to April 30 of year $t + 1$. R and $RMBVOL$ are the return and trading amount, respectively, on days with nonzero volume. A higher $Priceimpact$ implies higher non-proportional trading costs. The foregoing regressions are run again using $Priceimpact$ as the dependent variable, but the conclusions remain unchanged.

6.2.2. Robust test following Bhattacharya et al. (2008)

Bhattacharya et al. (2008) investigate the relationship between earnings quality and trading costs using a sample of US firms. They measure earnings quality with the modified Dechow and Dichev (2002) model used in Francis et al. (2005), and find that poor earnings quality increases adverse selection risk, as manifested in trading costs, and reduces liquidity in financial markets. In a second robustness test, the methodology of Bhattacharya et al. (2008) is used and the same conclusions are reached for the Chinese firms in the sample. Moreover, following Dechow and Dichev (2002), Francis et al. (2004) and Lang et al. (2012), further firm intrinsic (innate) factors are controlled for in the regressions, including firm size, capital intensity, operating cycle, cash flow variability, sales variability and the incidence of losses. The coefficients on accrual quality decrease dras-

Table 8
Estimation of the market pricing of positive and negative normal accruals with respect to their implications for one-year-ahead earnings.

	Forecast equation			Return equation			Market efficiency test	
	Coef.	Z-stat		Coef.	Z-stat		Chi2	P > Chi2
β				1.2476***	11.30			
$\beta0$	0.0105***	6.91	$\beta0^*$	−0.1258***	−7.75			
$\beta1$	0.6210***	51.65	$\beta1^*$	1.1647***	11.85	$\beta1 = \beta1^*$	30.17***	0.0000
$\beta2$	0.4838***	43.43	$\beta2^*$	1.0994***	11.42	$\beta2 = \beta2^*$	40.33***	0.0000
$\beta3$	**0.5295*****	**26.83**	**$\beta3^*$**	**1.2385*****	**8.04**	**$\beta3 = \beta3^*$**	**20.84*****	**0.0000**
$\beta4$	**0.4876*****	**15.98**	**$\beta4^*$**	**0.9346*****	**4.23**	**$\beta4 = \beta4^*$**	**4.01****	**0.0451**

*** Denote statistical significance at the 1% level.
** Denote statistical significance at the 5% level.
* Denote statistical significance at the 10% level.

tically, but remain significant, suggesting that poor accrual quality, whether due to the fundamental earnings process or the accounting system used to measure that process, can lead to higher trading costs.

7. Conclusion

Accruals provide investors with useful information about firm value. In China, however, not all investors can understand accrual information because of the country's low degree of market efficiency. In this paper, I find that investors in China misunderstand both abnormal and normal accruals. A higher absolute value of abnormal (normal) accruals is associated with higher stock trading costs. Moreover, under the short-selling constraints that prevail in the Chinese stock market, negative abnormal (normal) accruals have a greater effect on stock trading costs than positive abnormal (normal) accruals.

This paper has implications for accounting theory, securities regulation, and investment. First, the empirical evidence presented herein shows that the basic function of accounting is not only to provide a reliable record (of abnormal accruals, for example), but also to reflect economic reality. Trading costs will increase in the securities market if investors cannot understand a firm's economic reality (such as normal accruals). Second, this paper also shows that full disclosure, as suggested by the information perspective, is limited regardless of the disclosure form. Both the information and measurement perspectives should be considered when providing accounting information in a weak efficiency market. Third, I find market efficiency is weak in China and investors are naïve and fixated on earnings. Thus, to help Chinese investors to correctly price earnings, the government should increase the number of security analysts and the ownership level of institutional investors. Finally, the results presented in this paper imply that investors should pay close attention to both abnormal and normal accruals to avoid investment losses. Future research should consider the effects of short-selling constraints on the other economic consequences of earnings quality in China.

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