IAS 41 and Stock Price Informativeness

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Abstract

We investigate whether the adoption of International Accounting Standard 41: *Agriculture* influences firm-specific information flows capitalized into stock prices and thus affects stock price informativeness. Using a sample of IAS 41 adopters from countries that mandates IFRS in 2005 and the control samples of non-IAS 41 adopters, we find that price informativeness for IAS 41 adopters increases following IAS 41 adoption. We also find that the effect of IAS 41 adoption is similar between firms that transforms bearer plants, which derive value in use of assets and other biological assets. Overall, our results are consistent with the notion that the increased transparency from IAS 41 adoption broadly facilitates firm-specific information flows entering into stock market and thereby reduces synchronicity, making stock price more informative.

Keywords: Fair value; biological assets; IAS 41; firm-specific information; stock

price synchronicity

JEL Codes: M41; N50; D80

1. Introduction

This study investigates whether and how a firm's adoption of International Accounting Standard 41: Agriculture (IAS 41) influences firm-specific information flow into the market. IAS 41 was issued by International Accounting Standard Committee (IASC) in 2001 and became effective for annual reporting periods beginning on January 1, 2003, or upon adoption of IFRS. IAS 41 prescribes accounting treatment for biological assets, which are living plants and animals. Prior to the development of IAS 41, no uniform accounting standards were applied for biological assets (i.e., living animals or plants) and agricultural produce (i.e., the harvested product of the firm's biological assets). The diversity is causing difficulty for stakeholders in the agricultural sector.

We expect adoption of IAS 41 to facilitate firm-specific information and make stock price more informative for the following reasons. First, the crucial feature of IAS 41 is the application of the fair value model to all biological assets. Before adopting IAS 41, companies usually apply cost method to bearer animals (e.g., dairy cattle, beef cattle), or immature animals. Under the cost method, creditors and investors usually find the value of biological assets not relevant to reflect the biological transformation that the animal has undergone and has poor predictive value of expected future cash flows (IASB 2001). IAS 41 switches the measurement of biological assets from the historical cost convention to fair value.

Under IAS 41, firms should measure biological assets at fair value on initial recognition and at the end of reporting period. Biological assets and any gains or losses arising from changes in their fair value during the reporting period are also required to be separately presented on the balance sheet and income statement. Fair value is considered to best reflect the economic benefit accompanied by biological transformation (IASB 2001). Under fair value measurement, the amount presented on

the financial statement would change as biological transformation happens (i.e., the biological assets become mature). Information about the economic benefit associated with biological transformation is useful for investors in appraising current period performance and future prospects.

Second, IAS 41 enhances the disclosure of biological assets. A firm should provide (1) a description of biological assets the firm transforms and of the nature of activities involving the biological assets [41.41]; (2) a reconciliation of changes in the carrying amount of biological assets [41.50] and (3) the method and relevant assumptions used to determine fair value in the footnote to the financial statement [41.47][1]. Before adopting IAS 41, it is difficult for investors to obtain an understanding about the biological assets transformed by the firm because companies are not required to disclose the information. The enhanced disclosure of biological asset description and fair value reconciliation required by IAS 41 helps investors understand the nature of agricultural activity the firm engaged in and the economic outcomes associated with biological transformation. In line with Kim and Shi (2012), we argue that to the extent that enhanced disclosures via IAS 41 adoption facilitate the flow of higher-quality firm-specific information into the market at no additional (or cheaper) cost, investors are likely to rely more on firm-specific information than on common information. Such enhanced disclosure also improves firm level transparency.

We use stock price synchronicity to capture the extent of firm-specific information flow to stock prices, or equivalently, stock price informativeness. Observed stock prices reflect both common information and firm-specific information. Prior studies show that the enhanced flow of firm-specific information into the market increases firm-specific return variation, which in turn lowers stock price synchronicity (Piotroski and Roulstone 2004). Prior literature (eg., Morck, Yeung, and Yu 2000; Jin and Myers

2006; Hutton, Marcus, and Tehranian 2009; Kim and Shi 2012) use R^2 statistics from the market model to calculate stock price synchronicity. A higher (lower) extent of stock price synchronicity indicates a lower (higher) extent to which firm-specific information is incorporated into stock price and a less (more) informative stock price.

We test the effects of IAS 41 adoption on stock price informativeness using a sample of IAS 41 adopters comprising 712 firm-year observations from 18 IFRS adopting countries and Non-IAS 41 adopters comprising 4,316 firm-year observations from 15 local GAAP adopting countries. We use SIC code of IAS 41 adopters to identify Non-IAS 41 adopters that are potentially influenced by IAS 41. The sampling period is 2000 to 2009. We employ a difference-in-differences research design that compares the change in stock price synchronicity for IAS 41 adopters with changes for non-IAS 41 adopters over the pre-IAS 41 period (2000 to 2004) and the post-IAS 41 period (2005 to 2009). Following prior studies (eg., Jin and Myers 2006; Fernandes and Ferreira 2008; Dang, Moshirian, and Zhang 2015), we use R^2 statistic derived from the market model to calculate stock price synchronicity.

In addition, we also investigate whether the extent to which adopting IAS41 increases the price informativeness differ between bearer plants and other biological assets. Bearer biological assets are those other than consumable biological assets and are held to bear produce (IASB 2001). Examples include dairy cattle, laying hens, tea bushes and fruit trees. We expect that the effect differs between bearer plants and other biological assets for the following reasons. First, bearer plants are closer in nature of in-use assets. They are self-generating and realize value in combination with other assets. Fair value information is found to be less decision-useful for this kind of asset (Huffman 2016). Moreover, the IASB (2014) note that plants used solely to bear agricultural produce differ from most other biological assets because they are never

sold. Changes in the fair value of the bearer plants do not directly influence the entity's future cash flows. Fair value information is therefore less relevant to investors' decision making. Investors are then thought to rely less on the fair value information provided by IAS 41. The informativeness effect of IAS 41 adoption is correspondingly impaired.

Second, according to IASB (2014), there is complexity and practical difficulties in determining fair value of bearer plants in the absence of markets for these assets. Similarly, it is also difficult for financial statement users to make use of fair value information of bearer plants. The IASB further noted that investors, analysts and other users of financial statements adjust the reported profit or loss to eliminate the effects of changes in the fair values of bearer plants (IASB 2014). This implies that financial statement users are indifferent to the fair value information required by IAS 41. As a consequence, one can then expect that for firms transforming bearer plants, IAS 41 adoption facilitates little firm-specific information (i.e., there's not much difference in the pre- and post-IAS 41 period), leading to less informative stock price.

The results indicate that stock price synchronicity is lower for IAS 41 adopters following IAS 41 adoption, which supports the hypothesis that stock price becomes more informative for firms engaging in agricultural activities. We fail to find that the effect of IAS 41 adoption is differentiated by the biological assets transformed by firms engaging in agricultural activities. Our findings suggest that the channel through which IAS 41 adoption facilitates the flow of firm-specific information may line in the enhanced disclosure, not the fair value measurement.

This study contributes to the literature in several ways. First, we investigate the effect of fair value information of biological assets, a kind of non-financial assets, on stock price informativeness. This topic receives little attention of researchers in the past. We complement prior studies by documenting the firm-specific information facilitating

role of IAS 41. Second, we contribute to the literature of the ongoing debate over fair value and historical cost accounting by providing evidence that fair value measurement of biological assets improves financial report transparency and makes more firm-specific information publicly available to investors, motivating investors to trade accordingly. Finally, our study also adds to the literature on stock price synchronicity (or stock price informativeness) by documenting that fair value accounting is helpful in conveying firm-specific information to investors.

The remaining portion of this paper is organized as follows. In Section 2, we introduce the accounting treatments and disclosure requirements of IAS 41. In Section 3, we briefly review the literature on biological assets, fair value accounting and stock price synchronicity. Section 4 develops hypotheses and Section 5 presents the research design, sample selection as well as the descriptive statistics. Section 6 and 7 present empirical results of this study and additional test respectively. Section 8 concludes the paper.

2. International Accounting Standards (IAS) 41

IAS 41 was issued in 2001 and became effective for annual reporting periods beginning on January 1, 2003, or alternatively, upon adoption of IFRS. IAS 41 prescribes accounting treatment for biological assets transformed by firms engaging in agricultural activities. Agricultural activity is "the management by an entity of the biological transformation[3] and harvest of biological assets for sale or for conversion into agricultural produce[4]" (IASB 2001). Prior to the development of IAS 41, assets related to agricultural activity and changes in those assets were excluded from the scope of International Accounting Standards. As a result, accounting guidelines developed by national standard setter were applied to account for agricultural activities and the related

biological assets (IASB 2001). For example, under U.S GAAP (Accounting Standard Codification 905), biological assets of all entities in the agricultural industry are required to be classified as inventory or fixed assets, depending on their nature and intended use.

2.1 IAS 41 (2001) effective from 2003 to 2015

2.1.1 Fair value measurement for biological assets under IAS 41

IAS 41 requires firms to account for their biological asset and agricultural produce using fair value. Biological assets include living plants and animals and can be further classified as consumable and bearer as discussed above in the introduction. Fair value measurement is required for biological assets on initial recognition and at the end of each reporting date. Any gains or losses arising from changes in fair value is charged to profit and loss of the current period. We provide an overview and measurement requirements of IAS 41 in Panel A of Figure 1. Panel B and Panel C of Figure 1 present an example of balance sheet and income statement presentation under IAS 41. Such presentation is not available prior to IAS 41.

2.1.2 Exemption from fair value measurement under IAS 41

There are two occasions where cost model is permitted by IAS 41, inability to measure fair value reliably [41.30] and the early stage of biological assets' life [41.24]. When the biological asset is unique or of a very special nature, which causes that market-determined prices to be not available and alternative estimates of fair values to be clearly unreliable, IAS 41 permits that biological assets are measured at cost less any accumulated depreciation and any accumulated impairment losses. Besides, IAS 41 allows that cost may approximate fair value where little biological transformation has taken place since the initial cost was incurred (IASB 2001). For example, fruit tree seedlings planted immediately before the balance sheet date may undergo little

biological transformation. Therefore, cost for the plant may approximate fair value at the balance sheet date. The same applies when the impact of the biological transformation on price is not expected to be material. To illustrate, a pine tree has a plantation cycle of at least 30 years. The impact of initial growth in a 30-year plantation cycle is not expected to be material to the price of the pine tree.

2.1.3 Disclosure under IAS 41

In addition to presentation on the financial statement, IAS 41 requires firms to provide separate disclosure for biological assets in the footnote. Such disclosure includes (1) a description, whether narrative or quantitative, of biological assets the firm transforms and of the nature of activities involving the biological assets [41.41]; (2) a reconciliation of changes in the carrying amount of biological assets for the current period [41.50] and (3) the method and relevant assumptions used to determine fair value of biological assets [41.47]. Moreover, IAS 41 encourages but does not require firms to distinguish their biological assets between consumable and bearer or immature and mature [41.43] (IASB 2001). Panel A of Figure 2 presents the description of biological assets; Panel B presents the reconciliation table and Panel C the assumption used in determining fair value. These disclosures are not available in the pre-IAS 41 period.

2.2 Amendments to IAS 16 and IAS 41(2014) effective from 2016

Based on the ways how the biological assets derive value, biological assets can be simply classified as two types: biological assets that derive value in-exchange and biological assets that derive value in-use (Huffman, 2016). Plants used solely to bear agricultural produce derive value in-use and differ from most other biological assets because they are never sold (IASB, 2014). A trading market does not exist before bearer plants become mature. As a result, the fair value of bearer plants are not the

market-determined price, and subjective. Unavailable market value before bearer plants reach maturity leads to unreliable estimates of fair value. Thus, bearer plants are difficult to measure in a simplified FV model. Biological assets that derive value in-use rather than value-in exchange is essentially similar to the property, plant, equipment a firm has to generate profits.

The IASB receives many concerns about cost, complexity and practical difficulties of fair value measurement for bearer biological assets and start a limited-scope project for bearer biological assets in 2011 (IASB 2014). As a response, the IASB issued an amendment to IAS 41 in June 2014, excluding bearer plants from the scope of IAS 41. This amendment is effective for annual reporting period after January 1, 2016. The amendment, *Bearer Plants* (Amendments to IAS 16 and IAS 41) issued in 2014, being effective since 2016 intends to address concerns about the cost, complexity, and reliability of a fair value model in the absence of observable markets for bearer plants. The amendment moves bearer plants from the scope of IAS 41 to the scope of IAS 16 *Property, Plant, and Equipment*. After Amendments, the accounting standards become more consistent for long-term assets (PPE and bearer plants) which have essentially the same way to bring economic benefits to a firm. Thus, after Amendments, the recognition methods in the financial statements for bearer plants and other biological assets can help investors better understand the differences between these two types of assets and differences in the ways these two types of assets bring value to a firm.

3. Literature Review

3.1 Biological assets

Despite the importance of the primary sector to the global economy, accounting treatment for agricultural activities had seldom been a focus for accounting researchers. Using a sample of 389 firm-year observations of listed companies in IFRS adopting countries, Gonçalves and Lopes (2015) examine the value-relevance of fair value accounting for biological assets. Their results suggest that recognized biological assets are value-relevant. This relationship is strengthened after including the effect of the disclosure level of biological assets. Huffman (2016) tests the decision usefulness of fair value measurement of biological assets on a sample of international firms that adopted IAS 41. His findings suggest that the fair value of biological assets and the associated unrealized gains and losses are more decision-useful when the assets derive value in-exchange (consumable biological assets, like beef cattle and timber plantation), relative to when the assets derive value in-use (bearer biological assets, like dairy cattle and grape vines).

On the other hand, Daly and Skaife (2016) find that the cost of debt is higher for firms using the fair value method of accounting for their biological assets relative to firms using historical cost. However, this positive association is driven by firms that transform bearer plants, a sub class of biological assets that derives value in-use. Overall, prior studies suggest that required recognition and disclosure of biological assets under IAS 41 provides more relevant information while relevance, usefulness, and reliability of such information is reduced for bearer plants.

3.2 Fair value accounting

IAS 41 mandates fair value measurement for biological assets. This measurement is pervasively used in other IASs/IFRSs to account for non-financial assets and liabilities.

For example, firms are permitted to choose to measure their property, plant and equipment (IAS 16), intangibles (IAS 38), and investment properties (IAS 40) at fair value and required to recognize the cost of employee stock options (IFRS 2) using fair values as at the grant date (De George, Li, and Shivakumar 2016). On top of that, fair value measurement is also required for financial asset and liabilities and derivatives (IAS 39/IFRS 9). Fair value, as defined by International Financial Reporting Standard 13 is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (IASB 2011).

Although the IASB has introduced fair value accounting in their standards, there has been an ongoing debate over fair value accounting in recent decades. The debate mostly centered on the trade-off between relevance and reliability of accounting information. The financial crisis of 2008 has further pulled fair value accounting into spotlights (De George, Li, and Shivakumar 2016). Proponents argue that fair value reflects current market conditions and provide timely information (Laux and Leuz 2009). Besides, they think fair value to have greater relevance, more accurately reflect real volatility and simplify financial reporting (Song, Thomas, and Yi 2010). On the contrary, opponents claim that fair value is not relevant and misleading for assets that are held for a long period, especially for assets held to maturity. They were also in the view that fair values are not reliable (Laux and Leuz 2009). They further pointed out that fair values are less verifiable, subject to greater estimation error, and prone to greater managerial manipulation (Song, Thomas, and Yi 2010). Researches to date provide mixed results regarding this debate.

3.3 Stock price synchronicity

Observed stock prices reflect both common information and firm-specific information. Prior studies show that the enhanced flow of firm-specific information into the market

increases firm-specific return variation, which in turn lowers stock price synchronicity (Piotroski and Roulstone 2004). We therefore use stock price synchronicity to capture the extent of firm-specific information flow to stock prices, or equivalently, stock price informativeness. In empirical studies, stock price synchronicity is often measured by the R-squared statistics derived from the market model. In cross-country analyses, Morck, Yeung, and Yu (2000) find that stock prices in economies with lower per capita gross domestic product (GDP) tend to move together, which is not the case for economies with higher GDP. They interpret that this phenomenon is driven by poor protection of property rights that discourage informed arbitrage. Jin and Myers (2006) further explain that in addition to imperfect protection of investors' property rights, opacity is another factor causing higher R-squared. Both Kim and Shi (2012) and Dang, Moshirian, and Zhang (2015) provide evidence that synchronicity decreases with the strength of a country's institutional environments. Additionally, Kim and Shi (2012) find firm-level evidence that the synchronicity-reducing effect of IFRS adoption is greater for firms in countries with weaker institutions. Likewise, Fernandes and Ferreira (2008) examine the effect of cross listing in the U.S. market. Their findings suggest that the improvement in price in formativeness is concentrated in developed market firms.

A stream of literature investigates the association between ownership structure and stock price synchronicity (eg., Gul, Kim, and Qiu 2010; Boubaker, Mansali, and Rjiba 2014). Brockman and Yan (2009) for example find that block ownership is negatively associated with synchronicity since blockholders have a clear advantage in terms of the precision and acquisition cost of private information, more probability of informed trading reduce synchronicity.

4. Hypotheses development

Stock price reflects both common and firm-specific information. We expect adoption of IAS 41 to facilitate firm-specific information and make stock price more informative based on the following reasons. First, IAS 41 switches the measurement of biological assets from the historical cost convention to fair value. Fair value is considered to best reflect the economic benefit accompanied by biological transformation (IASB 2001). To illustrate, if fair value measurement is adopted, the amount presented on the financial statement would change as biological transformation happens (i.e., the biological assets become mature). Information about the economic benefit associated with biological transformation is useful for investors in appraising current period performance and future prospects (IASB 2001). In this context, fair value information facilitates dissemination of more reliable, firm-specific information to the market and thus motivates outside investors to rely more (less) on firm-specific (common) information when making their trading decisions (Kim and Shi 2012). As a result, the amount of firm-specific information incorporated into stock prices increases, or, equivalently, stock price synchronicity (informativeness) decreases (increases).

Second, the enhanced disclosure of biological asset description and fair value reconciliation required by IAS 41 helps investors understand the nature of agricultural activity the firm engaged in and the economic outcomes associated with biological transformation. Investors can obtain an understanding about the biological assets transformed by the firm from the disclosure. As Kim and Shi (2012) suggest, to the extent that enhanced disclosures via IAS 41 adoption facilitate the flow of higher-quality firm-specific information into the market at no additional (or cheaper) cost, investors are likely to rely more on firm-specific information than on common information. Additionally, such enhanced disclosure also improves firm level

transparency. As Hutton, Marcus, and Tehranian (2009) suggest, the increased transparency will reduces stock price synchronicity, leading to a more informative stock price.

Third, IAS 41 also requires firms to disclose the method and assumptions used in determining fair value of biological assets. Ryan (2008) believes that fair value measurement supported by disclosures of critical inputs and sensitivity of the measurement to the inputs is considerably more informative to users of financial statements. Investors are then more likely to collect, process and trade on firm-specific information. IAS 41 adoption can thus improve a firm's information environment by facilitating the flow of firm-specific information into the market. In such a case, IAS 41 adoption causes stock prices to co-move more (less) closely with firm-specific (common) information, thereby decreasing stock price synchronicity (increasing stock price informativeness). We form our hypothesis in alternative form:

H1: *Stock price is more informative for firms engaging in agricultural activities after adoption of IAS 41, ceteris paribus.*

Next, we turn our attention to effect of IAS 41 adoption among firms transforming different biological assets. According to Huffman (2016), variation exists in the manner in which firms employ their biological assets to realize value. We then expect that the effect differs between bearer plants and other biological assets (i.e., consumable biological assets and bearer animals) for the following reasons. First, bearer plants are closer in nature of in-use assets. They are self-generating and realize value in combination with other assets. Fair value information is found to be less decision-useful for this kind of asset (Huffman 2016). In addition, the IASB note that plants used solely to bear agricultural produce differ from most other biological assets because they are never sold (IASB 2014). Changes in the fair value of the bearer plants do not directly

influence the entity's future cash flows. Fair value information is therefore less relevant to investors' decision making. Investors are then thought to rely less on the fair value information provided by IAS 41. This will deter the dissemination of firm-specific information to the market. As a result, less firm-specific information is incorporated into stock price. The effect of IAS 41 adoption is correspondingly impaired.

Second, according to IASB (2014), there is complexity and practical difficulties in determining fair value of bearer plants in the absence of markets for these assets. Similarly, it is also difficult for financial statement users to make use of fair value information of bearer plants. The IASB further note that investors, analysts and other users of financial statements adjust the reported profit or loss to eliminate the effects of changes in the fair values of bearer plants (IASB 2014). This implies that financial statement users are indifferent to the fair value information required by IAS 41. As a consequence, one can then expect that for firms transforming bearer plants, IAS 41 adoption facilitates little firm-specific information (i.e., there's not much difference in the pre- and post-IAS 41 period), leading to a less extent to which firm-specific information is incorporated into stock price (i.e., a less informative stock price). We form our hypothesis as follows:

H2: *The extent to which adopting IAS 41 can increase stock price informativeness differs between bearer plants and other biological assets.*

5. Sample Selection and Research Design

5.1 Measuring stock price synchronicity

Our dependent variable is stock price synchronicity for each firm-year, which captures the extent to which firm-specific information flows into stock prices. This also captures stock price informativeness. Lower stock price synchronicity indicates more

informative stock price. Following prior studies (eg., Morck, Yeung, and Yu 2000; Jin and Myers 2006; Chan and Hameed 2006; Dang, Moshirian, and Zhang 2015; Eun, Wang, and Xiao 2015), we use a two-factor international model that includes both the local and the U.S. market index returns as follows. Specifically, for each sample year in each country, we regress firm *j*'s weekly returns (r_j) on the current and prior week's value-weighted market return (r_m) and the current and prior week's U.S. market index return adjusted by exchange rate ($r_{US} + EX$):

$$\begin{aligned} r_{i,j,w} = {} & a_i + \beta_{1,i} r_{m,j,w} + \beta_{2,i}(r_{US,w} + EX_{j,w}) + \beta_{3,i} r_{m,j,w-1} + \beta_{4,i}(r_{US,w-1} + EX_{j,w-1}) \\ & + \beta_{5,i} r_{m,j,w-2} + \beta_{6,i}(r_{US,w-2} + EX_{j,w-2}) + \beta_{7,i} r_{m,j,w+1} + \beta_{8,i}(r_{US,w+1} + EX_{j,w+1}) \\ & + \beta_{9,i} r_{m,j,w+2} + \beta_{10,i}(r_{US,w+2} + EX_{j,w+2}) + \varepsilon_{i,w} \end{aligned} \quad (1)$$

where $r_{i,j,w}$ is the current weekly return for firm *i* of country *j* in week, constructed from daily return drawn from Datastream; $r_{m,j,w}$ is the current weekly value-weighted domestic market index return for the country in which the stock is listed; $r_{US,w}$ is the U.S. market index return (CRSP value-weighted market return) as a proxy for the global market; $EX_{j,w}$ is the change in country *j*'s exchange rate to the U.S. dollars. $r_{US,w} + EX_{j,w}$ denoted the US market index return being adjusted for change in the exchange rate of country j against the US dollar.

Using weekly returns instead of daily returns helps avoid illiquidity of some securities with low trading volume, which introduces measurement errors for daily returns. We include a U.S. market index return to proxy for global market returns since most countries are exposed to foreign capital and foreign trades. In addition, the inclusion of lead and lag terms in Eq. (1) for firm return, the country market index return, and U.S. market index returns is to correct for nonsynchronous trading (Kim, Li, and Zhang 2011). By including lead and lagged return metrics, we correct for potential autocorrelation problems. In addition, we require that a minimum of 40 weekly return

observations be available for each firm in each year. Synchronicity for firm *j* from each country in each sample year (*SYNCH*) is defined as

$$SYNCH_{j,t} = \log\left(\frac{R_j^2}{1-R_j^2}\right) \quad (2)$$

Following Kim and Shi (2012), we use the log transformation of R^2 to create a continuous variable from a variable that is bounded by zero and one, thus making the dependent variable more normally distributed. High values of *SYNCH* indicate that individual firms' stock returns co-move closely with the market and/or industry returns, and thus the firm-specific return variation is low. For the purpose of our study, an inverse relation between IAS 41 adoption and the synchronicity measure can be viewed as an indication that IAS 41 adoption facilitates the flow of firm-specific information into the market and improves stock price informativeness.

5.2 Research model

5.2.1 Model for the effect of IAS 41 adoption (H1)

We explore the overall effect of IAS 41 adoption on stock price synchronicity using a difference-in-differences design. Specifically, we regress the firm-specific stock price synchronicity (*SYNCH*) on an indicator variable (*POST*) for the adoption of IAS 41 that is equal to one when the observation lies in the period after 2005 and zero otherwise.

$$\begin{aligned} SYNCH_{j,t} &= \beta_0 + \beta_1 POST_{j,t} + \beta_2 SIZE_{j,t} + \beta_3 LEV_{j,t} + \beta_4 StdROA_{j,t} + \beta_5 SIGMA_{j,t} \\ &+ \beta_6 VOL_{j,t} + \beta_7 ACCR_{j,t} + \beta_8 FREG_{j,t} + \beta_9 GDP_{j,t} + \beta_{10} Nlist_{j,t} \\ &+ YearDummies + CountryDummies + \varepsilon_{j,t} \end{aligned} \quad (3a)$$

Where $SYNCH_{j,t}$, as previously defined, is the measure for stock price synchronicity of firm *i* form country *j* in year *t*. *POST* is an indicator variable which takes the value of one for a firm-year falls in or after 2005 and zero otherwise; that is the time period after adoption of IAS 41 (i.e., fair value measurement and separate

disclosure is required for biological assets). We focus on the five years before and after the IAS 41 adoption, so that for a December year-end company, the pre-adoption period ranges from 2000 to 2004, while the post-adoption period ranges from 2005 to 2009.

If price informativeness is grater for firms that adopt IAS 41, we expect β_1 to be negative. A negative (positive) coefficient on β_1 is consistent with a decrease (increase) in stock price synchronicity.

Pre-Post effects for the Change sample and the No-effect sample

To mitigate the concern that adopting IFRS standards other than IAS 41 may increase the price informativeness after 2005, following Hsu and Pourjalali (2015) we estimate stock synchronicity for two sample: the Change sample and the No-effect sample. We categorize firms in the Change sample if those companies have biological assets and also adopt IAS 41. We use firms from non-IFRS countries and have the agricultural activity as the benchmark for no-effect sample. Section 5.3 describes more details about how to identify the change sample. The change sample is our treatment sample. IAS 41 should have no impact on the no-effect sample because they are not adopting IFRS. In Section 7.3, we use firms from IFRS countries but do not have biological assets as an alternative benchmark. The results remain qualitatively the same. Using the no-effect sample can isolate the change in stock synchronicity from the pre- to the post-IAS 41 period for firms that were unaffected by IAS 41, and thus it acts as our control for any changes contemporaneous with IAS 41 that might also have affected stock synchronicity.

We introduce the indicator *IAS41Change* in equation (3b), which equals to one for the change sample and zero for the no-effect sample.

$$SYNCH_{j,t} = \beta_0 + \beta_1 POST_{j,t} + \beta_2 IAS41Change_{j,t} + \beta_3 POST_{j,t} \times IAS41Change_{j,t} + \beta_4 SIZE_{j,t} + \beta_5 LEV_{j,t} + \beta_6 StdROA_{j,t} + \beta_7 SIGMA_{j,t} + \beta_8 VOL_{j,t} + \beta_9 ACCR_{j,t} + \beta_{10} FREG_{j,t} + \beta_{11} GDP_{j,t} + \beta_{12} Nlist_{j,t} + YearDummies + CountryDummies + \varepsilon_{j,t} \quad (3b)$$

The variable of interest is the coefficient on the interaction term, β_3, which captures the incremental change in stock price synchronicity for the change sample after 2005 relative to that for firms in the no-effect groups. $\beta_1 + \beta_3$ captures the incremental change of synchronicity after 2005 for the change sample. β_1 captures the incremental change of synchronicity after 2005 for the no-effect sample, which can reflect the factors other than IAS 41 that may change the synchronicity.

A negative (positive) coefficient on β_3 is consistent with a decrease (increase) in stock price synchronicity. If IAS 41 does facilitate the flow of firm-specific information into market, β_3 is expected to be significantly negative.

Control variables

We incorporate a set of firm-level control variables that are known from prior studies to influence the flow of firm-specific information in the market. We include Firm size (*SIZE*) as measured by the natural logarithm of the total market value at the end of the year because Piotroski and Roulstone (2004) suggest a significant positive relation between synchronicity and the market cap of the firm. We include *LEV* to control for firms' debt financing decision because prior literature have shown that financial leverage is important in explaining cross-sectional variation in stock return volatility (Boubaker, Mansali, and Rjiba 2014). Additionally, *StdROA* is added to control for earnings volatility because Piotroski and Roulstone (2004) show a negative correlation between synchronicity and earnings volatility. *SIGMA* is added to control

for return volatility of an individual firm because Chan and Hameed (2006) show that firms with more volatile returns produce more firm-specific information and are hence less impacted by market-wide information. We also include *VOL* to control for trading volume turnover because Gul, Kim, and Qiu (2010) find a significant negative relationship between synchronicity and the trading volume of a firm's stock. Hutton, Marcus, and Tehranian (2009) show that stock price synchronicity is positively related to financial reporting opacity associated with earnings management. Therefore, we add *ACCR* to control for the potential effect of earnings management. Following Kim and Shi (2012), we also control for firms' reporting frequency (*FREQ*) as they argue that more frequent financial reporting may facilitate firm-specific information flows into the market. We also control for year and country fixed effects.

Finally, prior studies have shown that synchronicity would be different in countries with different levels of economic and capital market developments (Morck, Yeung, and Yu 2000; Jin and Myers 2006). As a result, we also include gross domestic product per capita (*GDP*) and number of domestic listed company (*Nlist*) as country-level controls. To control for the potential effect of outliers, we winsorize the data at the top and bottom 1 percent. Definitions of all variables are provided in Appendix A.

5.2.2 Model for the difference across biological asset class (H2)

To test the difference in the effect of IAS 41 adoption on stock price synchronicity between bearer plants and other biological asset (i.e., consumable biological assets and bearer animals), we regress the firm-specific stock price synchronicity (*SYNCH*) on an indicator variable for the type of biological assets (bearer plants versus other biological assets), an indicator variable for the time period (pre- versus post-IAS 41 adoption period) and the interaction between these two indicators. The research model is as

follows:

$$SYNCH_{j,t} = \beta_0 + \beta_1 POST_{j,t} + \beta_2 BearerPlant_{j,t} + \beta_3 POST_{j,t} \times BearerPlant_{j,t} + \beta_4 SIZE_{ij,t} + \beta_5 LEV_{j,t} + \beta_6 StdROA_{j,t} + \beta_7 SIGMA_{j,t} + \beta_8 VOL_{j,t} + \beta_9 ACCR_{j,t} + \beta_{10} FREQ_{j,t} + \beta_{11} GDP_{j,t} + \beta_{12} Nlist_{j,t} + YearDummies + CountryDummies + \varepsilon_{j,t} \quad (4)$$

Where *BearerPlant* is an indicator variable that takes value of one for firms transforming bearer plants and zero otherwise. The variable of interest is the interaction term, the coefficient on which (β_3) captures the difference in change in stock price synchronicity between firms transforming bearer plants and firms transforming other biological assets. We do not expect the sign for the interaction term (β_3). A positive sign indicates a mitigated informativeness enhancing effect for bearer plants transforming firms following IAS 41 adoption. A negative sign, on the contrary, indicates a strengthened effect. The definition of remaining variables is the same as equation (3).

5.3 Sample selection

Our focus is on the impact of IAS 41 adoption on stock price informativeness, measured as stock price synchronicity. Following DeFond et al. (2015), we start our sample of IAS 41 adopters from publicly traded firms in 27 countries that mandate IFRS adoption in 2005. Similar to Gonçalves and Lopes (2015), for each mandatory IFRS adoption countries, we search for firms that are influenced by IAS 41 using five balance sheet and income statement items in Worldscope over the period 2005-2015. They are Biological Asset NBV (WC18277), Biological Asset Gross (WC18278), Biological Assets Current (WC18258), Biological Assets Accumulated Depreciation (WC18279), and Unrealized Valuation Gains/Losses Biological Assets (WC18573). Non-zero value of these items indicates that following IAS 41, a firm reports biological assets and related items in its financial reports[6]. We identify 405 firms during this process.

Subsequently, we hand-collect the annual report of these firms and eliminate 132 firms whose annual reports are not available and 17 firms whose annual reports are non-English. We then check the annual report of the remaining sample firms to gather the following information: (1) The biological assets transformed by the underlying firm (i.e., whether the biological assets should be classified as consumable, bearer animals or bearer plants); (2) Whether the biological assets are measured at fair value or historical cost and (3) The fair value hierarchy or method applied to determining fair value.[7] Through reading the annual report, we identify 96 firms that are not actually engaged in agriculture activities (i.e., they do not report biological assets on their financial statements[8] and eliminate them from the sample as a result. Another 11 firms are excluded from our sample because their annual reports do not present enough information for our analysis. We also identify 18 firms that do not apply fair value measurement for biological assets after IAS 41 adoption. We do not include these firms in our sample as the measurement for biological assets do not differ in the pre- and post-adoption period. The final sample consists of 131 firms from 18 IFRS adopting countries. We call this sample as *treatment group*, as they adopt and are affected by IAS 41 in the post-IAS 41 period. Table 1, Panel A presents the process of sample selection of *treatment group*.

Following DeFond et al. (2015), we start our sample of Non-IAS 41 adopters from publicly traded firms in 19 countries that do not mandate IFRS adoption. We use SIC code to identify firms that are potentially affected by IAS 41. We tabulate the distribution of the *treatment group* among based on 2digit-SIC codes. Panel B of Table 1 presents the distribution of the SIC code. Next, we utilize these codes as criteria to find non-IAS 41 adopting firms potentially affected by IAS 41. Specifically, we search for sectors that are directly associated with agricultural activities from panel B of Table

1. In addition to Division A: Agriculture, Forestry and Fishing (SIC code less than 1000, including 01 Agricultural Production Crops, 02 Agriculture production livestock and animal specialties, 07 Agricultural Services, 08 Forestry and 09 Fishing, hunting and trapping). The *treatment group* is mainly distributed among Division D: Manufacturing (2-digit SIC code 20 to 39) and Division F (2-digit SIC code 50 and 51). Conceptually, Division A should be affected by IAS 41 most, as they are most likely to engage in agricultural activity defined by IAS 41. However, not every firm in Division D and Division F is likely to be affected by IAS 41, as they are not necessary to transform biological assets. Consequently, we include all firms that fall within Division A. For firms that fall within Division D and Division F, we restrict the control sample to the sectors that are identical with the *treatment group* and directly associated with agriculture activities. The final control sample consists of local GAAP users in 15 non-IFRS adopting countries. We call this sample as *control group*. We then collect data for treatment and control group during fiscal year 2000 to 2009 (5,793 firm years). 674 and 91 firm years are excluded from our sample because there is not sufficient data to calculate control variables and stock price synchronicity respectively. Our final sample comprise 5,028 firm years, with 712 firm years in treatment group and 4,316 firm years in control group. Table 2, Panel A present our sample construction process. Table 2, Panel B and Panel C present the firm-year distribution of *treatment group* and *control group* among countries respectively.

5.4 Descriptive statistics

Section A, B and C of Table 3 present descriptive statistics of the dependent and control variables included in our analysis for the full sample (N=5,028), subsample of IAS 41 adopters (N=712) and the subsample of Non-IAS 41 adopters (N=4,316) respectively. Section D of Table 3 presents the t-statistics for the mean differences between IAS 41

and Non-IAS 41 adopters. The average stock price synchronicity (*SYNCH)* is -1.06 for IAS 41 adopters and -1.03 for non-IAS 41 adopters. However, we do not find significantly differences in stock price synchronicity different between IAS 41 adopters and non-IAS 41 adopters. Both firm-specific and country-level controls are significantly different, except for the potential earnings management (*ACCR).*

Table 4 presents Pearson correlation coefficients between the variables included in the regression. Stock price synchronicity (*SYNCH*) is positively associated with firm size (*SIZE*), leverage (*LEV*), trading volume turnover (*VOL*), reporting frequency (*FREQ*) and gross product per capita (*GDP*), while it is negatively correlated with earnings volatility (*StdROA*), return volatility (*SIGMA*), potential earnings management (*ACCR*) and number of domestic listed companies (*Nlist*).

6. Empirical Results

6.1 Result for H1

Table 5 Panel A presents the regression results of the average effect of IAS 41 adoption on stock price informativeness for firms engaging in agricultural activities. Columns (1) include firm-level and country-level control variables, columns (2) include all control variables and year-fixed effect, and columns (3) report full regression models with year-fixed and country-fixed effect. As reported in Table 5, the coefficient β_3 on the interaction term, $POST \times IAS41$, is significantly negative. This result is in line with the hypothesis that IAS 41 adoption facilitates firm-specific information into the market, which, in turn, lowers stock price synchronicity and makes stock price more informative.

For ease of exposition, Panel B of Table 5 reports the reconstructed coefficients and the significance levels in a two-by-two analysis for the full sample period. The Columns in Panel B partition the sample by the pre-IAS 41 (2000-2004) and post-IAS 41 (2005-2009) and the rows partition the sample by the change sample for IAS 41 and

the no-effect sample for IAS 41. The individual cells as well as the row differences and column differences are constructed using the coefficients in Column (3) of Panel A.

There are three important observations. First, comparing the two columns in Panel B of Table 5, we find that the increase (decrease) in stock synchronicity (price informativeness) is much lower after 2005 for the change sample than the no-effect sample. The no-effect sample for IAS 41 experience an increase in stock synchronicity and a decrease in price informativeness after 2005 (0.975 versus 1.639, two tailed $p<0.01$). For the change sample, the stock synchronicity increase to a less extent after 2005 than the increase for the no-effect sample ($0.457<0.664$).

Second, comparing the two rows in Panel B shows that the change sample has higher synchronicity than the no-effect sample ($1.517 > 0.975$). However, after 2005, the cross-sectional differences between the change sample and the no-effect sample prior to 2005 become much smaller after 2005 (0.542 vs 0.335). The results are consistent with our expectation that IAS41 can improve financial reporting quality for firms with biological assets.

In summary, the no-effect sample can isolate the change in stock synchronicity from the pre-to the post-IAS 41 period for firms that were unaffected by IAS 41, and can control for any changes contemporaneous with IAS 41 that might also have affected stock synchronicity. The difference-in-difference results (-0.207) in Panel B suggest that the adoption of IAS 41 is associated with a lower stock synchronicity (higher price informativeness) after 2005 for the change sample than the no-effect sample.

6.2 Result for H2

Table 6 presents the regression results of the difference in the effect of IAS 41 adoption between firms transforming bearer plant and other biological assets. Column (1)

includes firm-level and country-level control variables, column (2) includes all control variables and year-fixed effect, and column (3) reports full regression models with year-fixed and country-fixed effect. As shown in Table 6, the coefficient β_3 on the interaction term, $POST \times BearerPlant$, is not statistically significant. Therefore, we fail to provide evidence that the effect of IAS 41 adoption differs between firms transforming bearer plants and their counterparts transforming other biological assets. This may result from the relatively small sample size. Another conjecture is that the channel through which IAS 41 adoption facilitate the flow of firm-specific information lines in the enhanced disclosure, not asset measurement.

7. Additional tests

7.1 Comparison between high-level and low-level of asset importance

The findings of main tests suggest that IAS 41 reduces stock price synchronicity of firms engaging in agriculture activities. However, the results only show that IAS 41 casts an overall benefit of increasing financial report transparency. In an attempt to gain insights into the factors that differentiate the overall effect of IAS 41 among firms engaging in agricultural activities, we perform an additional test.

We now turn our attention to the importance of biological assets. When biological assets are more critical to the firm's operation (e.g., biological assets comprise a large portion of total assets or net income), investors will value the information provided by IAS 41 more. The synchronicity-reducing effect of IAS 41 should correspondingly be strengthened. We divide the treatment sample into two groups based on importance of biological assets (the definition is provided in the following paragraph). Since investors value the fair value information provided by IAS 41 more as biological assets becomes more significant, we expect that firms with higher value of biological assets decrease stock price synchronicity more, relative to those with lower value. We develop the

research model as equation (5).

$$SYNCH_{j,t} = \beta_0 + \beta_1 POST_{j,t} + \beta_2 HIGH_{j,t} + \beta_3 POST_{j,t} \times HIGH_{j,t} + \beta_4 SIZE_{j,t} + \beta_5 LEV_{j,t} + \beta_6 StdROA_{j,t} + \beta_7 SIGMA_{j,t} + \beta_8 VOL_{j,t} + \beta_9 ACCR_{j,t} + \beta_{10} FREQ_{j,t} + \beta_{11} GDP_{j,t} + \beta_{12} Nlist_{j,t} + YearDummies + CountryDummies + \varepsilon_{j.t} \quad (5)$$

Where *HIGH* is coded 1 for firms with the value of biological assets above the median of the treatment sample. Biological assets importance is measured by the ratio of total biological assets to total assets and by the ratio of unrealized gains or losses of biological assets to net income. The remaining variable are defined the same as the main test.

Table 7 presents the result for the regression. Column (1) to (3) present the results where biological assets importance is measured by the ratio of total biological assets to total assets, while column (4) to (6) presents the results where importance is measured by the ratio of unrealized gains or losses of biological assets to net income. Column (1) includes firm-level and country-level control variables, column (2) includes all control variables and year-fixed effect, and column (3) reports full regression models with year-fixed and country-fixed effect. The coefficient β_3 on the interaction term $POST \times HIGH$ is not statistically significant in either column.[9] As a consequence, we fail to find that the effect of IAS 41 adoption can change with the size of biological assets.

7.2 Control for industrial developments of agricultural sector

It is likely that our results may be driven by the industrial developments of agricultural sector. In particular, the fair value method is the underlying principle behind IAS 41, which attempts to factor economic reality into the value of growing biological assets over time so as to derive a relevant estimate of the value of the assets held and the financial

performance of the firm that holds them. The key assumption of the usefulness of fair value in IAS 41 must be that the fair value of the growing biological assets can be fairly, judiciously and reasonably estimated or obtained through market information or with sound valuation methodologies. Thus, we expect the price informativenss can be affected by the industrial development of agricultural sector in that country.

We define firms with high industrial development of agricultural sector if the GDP of agricultural sector is above 3 % and 0 if otherwise. We collect the composition of GDP from the World Factbook. Table 8 reports the results. We find that our main results in Table 5 are more pronounced in firms from the country with high GDP from agricultural sector than the other firms. Our results support the argument that the fair value approach can be influenced by the industrial development of agricultural sector.

7.3 IFRS adopters that have no biological assets as control group

We define the IAS41 no effect sample using the non-IFRS adopters, which consist of local GAAP users in 15 non-IFRS adopting countries. We follow prior studies (e.g., DeFond et al., 2015) to use non-IFRS adopters because this can help control for contemporaneous effects that are unrelated to the introduction of IFRS. However, using non-IFRS adopters can be influenced by unspecified cross-country differences.

To address the concern of the cross-country differences, we us the IFRS adopters that have no biological assets to be the control group. Table 9 reports that the coefficient on the interaction term is negative and significant. The results are consistent with H1 that the change sample experience a decrease in stock synchronicity following the adoption of IAS 41.

7.4 Limit firms with the value of total biological assets above 5% of total assets

We tradeoff the size of the treatment sample and the importance of the biological assets to the firm. In our main sample, we include in our treatment sample when there is one non-zero value of the biological assets in the balance sheet and income statement. However, there is a concern that we may include firms, in which biological assets are relatively unimportant. Thus, we follow Huffman (2016) by including only firms who have total biological assets (both current and noncurrent) that are greater than 5 % of its total assets in my sample. By doing so, we ensure that firms hold a significant level of biological assets and are affected by IAS 41 adoption. The final sample consists of 53 firms from 18 IFRS adopting countries that are engaging in agricultural activities.

Table 10 reports the results. The interaction term, $POST \times IAS41Change$, is significantly negative. These results remain the same as our main results. IAS 41 facilitates firm-specific information into the market and stock price of firms engaging in agricultural activities becomes more informative following IAS 41 adoption.

8. Conclusion

In this study, we investigate whether the enhanced disclosure by IAS 41 facilitates firm-specific information and make stock price more informative. Information about biological assets are not directly available through financial reports prior to adoption of IAS 41. Therefore, IAS 41 provide an ideal setting for testing whether the disclosure and fair value information about biological assets improve financial report transparency and motivate investors to trade on this information.

Using a sample of treatment group consist of IAS 41 adopters from countries that mandates IFRS adoption in 2005 and control group consist of non-IAS 41 adopters, we find that stock price synchronicity is significantly lower for IAS 41 adopters following IAS 41 adoption. This finding indicates that IAS 41 adoption facilitates the flow of

firm-specific information into stock market and correspondingly enhances stock price informativeness. We next examine whether there is difference in the firm-specific information facilitating effect of IAS 41 adoption between firms transforming bearer plant and other biological assets. However, we fail to find that the effect of IAS 41 adoption is differentiated by the biological assets transformed by firms engaging in agricultural activities. Our conjecture is that the channel through which IAS 41 adoption facilitate the flow of firm-specific information lines in the enhanced disclosure, not asset measurement.

This study contributes to the literature in several ways. First, we contribute to the literature by investigating the effect of fair value information of biological assets on stock price informativeness. This topic receives little attention of researchers in the past. We complement prior studies by documenting the firm-specific information facilitating role of IAS 41. Second, we add to the literature of the ongoing debate over fair value and historical cost accounting. We provide evidence that fair value measurement of biological assets improves financial report transparency and makes more firm-specific information publicly available to investors, motivating them to trade accordingly. Third, we complement previous studies on stock price synchronicity (or stock price informativeness) by documenting that fair value measurement is helpful in conveying firm-specific information to investors.

Notes

1. This requirement is deleted after IFRS 13 was applied to annual periods beginning or after 1 January 2013; while the requirement of IFRS 13 is similar to that of IAS 41.
2. A bearer plant is a living plant that: (1) is used in the production or supply of agricultural produce; (2) is expected to bear produce for more than one period; and (3) has a remote likelihood of being sold as agricultural produce, except for incidental scrap sales (IASB 2014).
3. Biological transformation comprises the process of growth, degeneration, production and procreation that cause qualitative or quantitative changes in a biological asset (IASB 2001).
4. Agricultural produce is the "harvested product of the entity's biological assets" (IASB 2001).
5. Level 3 inputs are also commonly referred to as mark-to-model approach.
6. Biological Asset Gross, Biological Assets Accumulated Depreciation and Biological Asset NBV represent biological assets that are classified as non-current, while Biological Assets Current represents biological assets that are classified as current. Unrealized Valuation Gains/Losses Biological Assets represents the gains or losses arising from changes in fair value of biological assets.
7. For firm-years when firm are not required to disclose fair value hierarchy information, we read through the disclosure about the method applied to determine fair value of biological assets and classify them among level 1, level 2 and level 3 (e.g., a discounted cash flow model is equivalent to a level 3 fair value).
8. After checking with the database, this may result from the misclassification in their data-collecting process (e.g., they misclassify mining assets as biological assets).
9. In an untabulated analysis, we test whether firms' primary SIC code is directly associated with agricultural activities is a factor differentiating the effect of IAS 41. The results are not statistically significant.
10. The example is taken from the 2015 annual report of Australian Agricultural Company Limited.
11. The example is taken from the 2015 annual report of Australian Agricultural Company Limited

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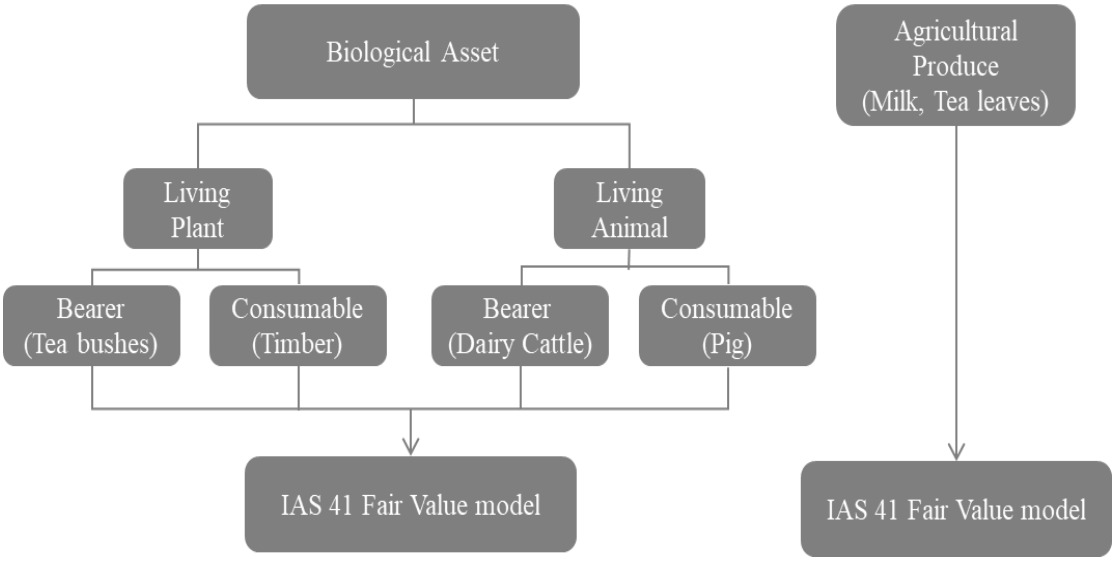
Appendix. Variable Definition

Variable	Definition
Dependent and test variables	
SYNCH	Stock price synchronicity calculated by equation (2).
POST	Indicator, coded 1 for firm-years after the adoption of IAS 41 (fair value measurement for biological assets).
IAS41	Indicator, coded 1 for firms adopting IAS 41 in 2005.
BearerPlant	Indicator, coded 1 for firms transforming bearer plants.
HIGH	Indicator, coded 1 for firms with the value of biological assets above the median of the treatment sample.
LEVEL3	Indicator, coded 1 for firms using level 3 fair value for biological assets.
Firm-specific controls	
SIZE	Firm size measured by the natural log of the total assets at the end of the year.
LEV	Ratio of total debt to total assets.
StdROA	The historical standard deviation of ROA computed over the preceding 5 years.
SIGMA	The standard deviation of firm-specific weekly returns over the firm-year *t*.
VOL	Trading volume computed as the total number of shares traded in a year , divided by the total number of shares outstanding at the end of the year.
ACCR	Absolute value of accounting accruals scaled by the absolute value of operating cash flows.
FREQ	Reporting frequency, measured by the number of interim financial reports disclosed by a firm.
Country level controls	
GDP	Natural log of the gross domestic product per capita.
Nlist	Natural log of the number of listed firms for a given country.

Figure 1 Overview and presentation example of IAS 41[10]
Panel A Scope and requirements of IAS 41



Panel B Balance sheet presentation after IAS 41

	NOTE	31 MAR 2015 $000
Current Assets		
Cash and cash equivalents	12	12,285
Trade and other receivables	13	29,855
Inventories and consumables	14	36,803
Biological assets – livestock	15	200,077
Derivative financial instruments	20	-
Other assets		1,566
Total Current Assets		280,586
Non-Current Assets		
Biological assets – livestock	15	265,109
Property, plant and equipment	16	668,396
Total Non-Current Assets		933,505
Total Assets		1,214,091

Panel C Income statement presentation after IAS 41

	NOTE	31 MAR 2015 $000
Revenue		
Meat sales		267,622
Cattle sales		70,546
Crop income		8,664
		346,832
Cattle fair value adjustments	15	209,900
		556,732
Cost of meat sold		(238,764)
Deemed cost of cattle sold		(70,546)
Cattle expenses		(48,702)
Feedlot cattle expenses		(49,749)
Crop costs and fair value adjustments		(8,084)
Gross operating margin		140,887
Other income	7	3,796

Figure 2. Disclosure of biological assets under IAS 41[11]

Panel A Description of biological assets

(g) Biological assets

Biological assets comprise cattle, other livestock, crops not yet harvested, and harvested crops. Biological assets are measured at fair value less costs to sell, with any change recognised in the income statement. Costs to sell include all costs that would be necessary to sell the assets, including freight and direct selling costs.

The fair value of a biological asset is based on its present location and condition. If an active or other effective market exists for a biological asset or agricultural produce in its present location and condition, the quoted price in that market is the appropriate basis for determining the fair value of that asset. Where we have access to different markets then we use the most relevant one. The relevant one is defined as the market "that access is available to the entity" to be used at the time the fair value is established.

If an active market does not exist then we use one of the following, when available, in determining fair value:

- the most recent market transaction price, provided that there has not been a significant change in economic circumstances between the date of that transaction and the end of the reporting period; or
- market prices, in markets accessible to the entity, for similar assets with adjustments to reflect differences; or
- sector benchmarks.

In the event that market determined prices or values are not available for a biological asset in its present condition we may use the present value of the expected net cashflows from the asset discounted at a current market determined rate in determining fair value.

(i) Livestock

Broadly, for the most significant types of cattle we determine net market values as follows:

	VALUATION METHOD
Commercial breeding herd (comprising principally females and breeding bulls)	The value of these cattle is determined by independent valuation and with reference to prices received for representative sales of breeding cattle similar to the Group's herd. Prices for these cattle generally reflect a longer term view of the cattle market. Independent valuations were undertaken by Elders Limited.
Trading cattle (including feedlot cattle)	Relevant market indicators used include Roma store cattle prices, abattoir market prices, and cattle prices received/quoted for the Group's cattle at the reporting date. Prices for these cattle generally reflect the shorter term spot prices available in the market place and vary based on the weight and condition of the animal. AACo live export cattle (Victoria River Group, Anthony Lagoon & Darwin Group) are valued based on market quotes available at each reporting date. Short fed cattle in feedlots are valued based on market quotes for finished cattle. The value is based on the estimated exit price per kilogram and the value changes for the weight of each animal as it progresses through the feedlot program. Wagyu trading cattle are valued on the basis of independent valuation by Elders Limited.
Stud breeding herd	Independent valuation by Elders Limited.
Unbranded calves	The number of these calves is determined by applying the percentage of branding assessed each year to the number of productive cows and the results of pregnancy testing. The valuation of calves is derived from the valuations applied to the first year branded animals across all cattle market categories in AACo's herds.

Panel B Reconciliation table

Livestock movement	
Opening carrying amount	383,047
Gain from changes to fair value less estimated point of sale costs	216,570
Purchases of livestock	79,965
External sale of livestock and transfers for meat sales	(214,396)
Closing carrying amount	465,186

Panel C Determining fair value of biological assets

Total Herd

FAIR VALUE INPUT	CATTLE TYPE	31 MAR 2015 $000	31 MAR 2015 HEAD	31 MAR 2014 $000	31 MAR 2014 HEAD
Level 1	None	-	-	-	-
Level 2	All except Level 3	355,433	457,290	295,467	428,319
Level 3	Feedlot cattle & unbranded calves	109,753	140,269	87,580	123,746
		465,186	**597,559**	**383,047**	**552,065**
Average value per head		$778		$694	

Fair Value Inputs are summarised as follows:

Level 1 Price Inputs – are quoted prices (unadjusted) in active markets for identical assets or liabilities that can be accessed at the measurement date.

Level 2 Price Inputs – are input prices other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly (refer to note 3(g) for the accounting policy for biological assets).

Level 3 Price Inputs – are unobservable inputs for the asset or liability.

Feedlot Cattle

Feedlot cattle are valued internally by the Group as there is no observable market for them. The value is based on the estimated exit price per kilogram and the value changes for the weight of each animal as it progresses through the feedlot program. The key factors affecting the value of each beast are price/kg, days on feed, and the feed conversion ratio. The average daily gain of weight is in the range of 0.8kgs to 2.0kgs. The value is determined by applying the average weight gain per day by the number of days on feed from induction to exit at which point the cattle are delivered to market. The value per animal is based on the breed and specifications of the animal and the market it is destined for.

Significant increases (decreases) in any of the significant unobservable valuation inputs for feedlot cattle in isolation would result in a significantly higher (lower) fair value measurement.

	31 MAR 15 $000	31 MAR 15 HEAD	31 MAR 14 $000	31 MAR 14 HEAD
Opening values	68,648	38,696	69,879	38,831
Inductions	116,262	104,755	76,553	81,305
Sales	(119,723)	(88,522)	(104,396)	(80,847)
Attritions & rations	(812)	(533)	(879)	(593)
Fair value adjustments recognised*	21,177	-	27,491	-
	85,552	54,396	68,648	38,696
Average value per head		$1,573		$1,774

Unbranded Calves

Calves are valued internally as there is no observable market for them. The valuation of calves is derived from the valuations applied to the first year branded animals across all cattle market categories in AACo's herds. The number of these calves is determined by applying the percentage of branding assessed each year to the number of productive cows and the results of pregnancy testing. Significant increases (decreases) in any of the significant unobservable valuation inputs for unbranded calves in isolation would result in a significantly higher (lower) fair value measurement.

	31 MAR 15 $000	31 MAR 15 HEAD	31 MAR 14 $000	31 MAR 14 HEAD
Calf accrual opening	18,932	85,050	24,605	123,692
Net movement	183	823	(8,601)	(38,642)
Net fair value adjustments*	5,086	-	2,928	-
Calf accrual closing	24,201	85,873	18,932	85,050
Average Value per head		$282		$223

*These fair value adjustments are recognised in the Cattle fair value adjustments line of the Consolidated Income Statement.

CATTLE SALES AND DEEMED COST OF SALES	31 MAR 2015 $000	31 MAR 2014 $000
Cattle sales	70,546	229,223
Cost of sales	(63,909)	(212,444)
Selling expenses	(6,637)	(16,779)
Deemed cost of sales	(70,546)	(229,223)
Sales margin[1]	-	-

Table 1. Sample Selection and Distribution of treatment firms

Panel A: Sample selection of *treatment sample*

	# of firms
Firms with biological assets over the period 2005-2015	405
Less:	
Firms whose annual reports are unavailable	(132)
Firms with non-English report	(17)
Firms that are not engaged in agricultural activities	(96)
Firms without enough data to construct variables in the tests	(11)
Firms which use cost model to measure biological assets	(18)
Treatment sample	**131**

Panel B: Distribution of *treatment sample* among sectors

2digit SIC code	**Industry Description**	**# of firms**
01	Agriculture production crops	19
02	Agriculture production livestock and animal specialties	15
07	Agricultural services	5
08	Forestry	1
09	Fishing, hunting, and trapping	3
10	Metal mining	1
12	Coal mining	2
14	Mining and quarrying of nonmetallic minerals	1
15	Building construction general contractors and operative builders	1
20	Food and kindred products	37
22	Textile mill products	1
23	Apparel and other finished products made from fabrics	1
24	Lumber and wood products	5
26	Paper and allied products	9
28	Chemical and allied products	4
30	Runner and miscellaneous plastics products	2
33	Primary mental industries	1
34	Fabricated metal industries	2
35	Industrial and commercial machinery ad computer equipment	1
37	Transportation equipment	1
44	Water transportation	1
47	Transportation service	1
50	Wholesale trade-durable goods	2

51	Wholesale trade-non-durable goods	7
58	Eating and drinking places	1
65	Real estate	3
67	Holding and other investment offices	1
73	Business services	1
79	Amusement & recreation services	1
87	Engineering, accounting, research, management and related services	1
Total		131

Table 1 presents the sample selection and distribution for treatment firms. Panel A reports the sample selection process for our treatment firms. Panel B reports the sample distribution by industry sector for our treatment sample. Column 1 reports the 2-digit SIC code. Column 2 reports the industry description. Column 3 reports the number of IAS 41 adopters in each industry.

Table 2. Sample Construction and Distribution

Panel A: Sample construction

	Firm-year obs.
Treatment and control firm years 2000-2009	5,793
Excluding firm years:	
With insufficient data to calculate control variables	674
With insufficient data to calculate stock price synchronicity	91
Final sample	**5,028**

Panel B: country distribution for IAS 41treatment firms

Country	**Firm-year obs.**
Belgium (0.7%)	10
Finland (3%)	20
France (1.9%)	10
Germany (0.8%)	12
Greece (3.3%)	15
Ireland (2%)	13
Italy (2%)	8
Norway (2.7%)	33
Portugal (2.5%)	16
Spain (3.3%)	8
Sweden (1.8%)	4
Switzerland (1.3%)	10
UK (0.7%)	66
Poland (3.4%)	9
Australia (4%)	117
Hong Kong (0.1%)	217
Philippines (12.8%)	21
South Africa (2.5%)	123
Total	**712**

Table 2 (Continued)

Panel C: Country distribution for control group

Country	Firm-year obs.
Argentina	83
Brazil	99
Canada	117
Chile	182
China	827
Indonesia	210
Japan	1,057
Korea	520
Mexico	31
Morocco	16
Pakistan	53
Sri Lanka	207
Taiwan	310
Thailand	230
United States	374
Total	**4,316**

Table 2 presents the firm-year distribution of full sample among both IAS 41 adopting and Non-IAS 41 adopting countries. Our sample includes firm-year observations of both treatment group and control groups five years before and after IAS 41 adoption in 2005. Panel A reports the sample selection process for our firm-year observations. Panel B reports the sample distribution by country for our treatment group. Panel C reports the sample distribution by country for our control groups.

Table 3. Descriptive Statistics

	Section A Full sample (N=5,028)			Section B IAS 41 adopters (N=712)			Section C Non-IAS 41 adopters (N=4,316)			Section D Diff. in mean
	Mean	Median	Std.	Mean	Median	Std.	Mean	Median	Std.	t-value
SYNCH	-1.03	-1.04	0.76	-1.06	-1.09	0.68	-1.03	-1.03	0.78	1.174
SIZE	12.32	12.31	1.70	12.45	12.53	1.90	12.31	12.28	1.66	-2.069**
LEV	0.27	0.25	0.20	0.22	0.20	0.18	0.28	0.26	0.20	7.855***
StdROA	0.07	0.04	0.14	0.14	0.07	0.21	0.06	0.03	0.12	-13.079***
SIGMA	0.05	0.04	0.03	0.06	0.05	0.04	0.05	0.04	0.03	-6.077***
VOL	1.48	0.47	2.74	0.58	0.31	0.83	1.63	0.52	2.91	9.580***
ACCR	2.34	0.67	6.58	2.65	0.66	6.49	2.28	0.67	6.59	-1.389
FREQ	2.13	3.00	1.17	1.43	1.00	0.91	2.25	3.00	1.16	17.832***
GDP	9.26	9.74	1.32	9.90	10.19	0.93	9.16	9.64	1.35	-14.159***
Nlist	7.03	7.26	0.97	6.55	6.93	0.97	7.10	7.33	0.95	14.253***

Table 3 presents descriptive statistics for stock price synchronicity and control variables. Our sample includes firm-year observations of both treatment group and control groups five years before and after IAS 41 adoption in 2005. The variables are described in Appendix. Section A reports the descriptive statistics for the full sample. Section B reports the descriptive statistics for the subsample of IFRS adopters. Section C reports the descriptive statistics for the subsample of non-IAS 41 adopters. Section D tests the difference between the IFRS adopters and non-adopters. The *t* value tests the difference of the mean value between the two groups. Here *, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively, for a two-tailed test.

Table 4. Correlation Table

	SYNCH	*SIZE*	*LEV*	*StdROA*	*SIGMA*	*VOL*	*ACCR*	*FREQ*	*GDP*	*Nlist*
SYNCH	1.000									
SIZE	0.308***	1.000								
LEV	0.007	0.114***	1.000							
StdROA	-0.127***	-0.313***	0.109***	1.000						
SIGMA	-0.238***	-0.369***	0.167***	0.418***	1.000					
VOL	0.046***	-0.006	0.122***	-0.000	0.208***	1.000				
ACCR	-0.024*	-0.105***	0.077***	0.196***	0.138***	0.040***	1.000			
FREQ	0.010	0.025*	0.025*	-0.011	-0.021	0.004	-0.005	1.000		
GDP	0.135***	0.247***	-0.088***	0.037***	-0.030**	-0.052***	-0.055***	-0.190***	1.000	

Table 4 presents Pearson Correlation Coefficients for all test variables. Our sample includes firm-year observations of both treatment group and control groups five years before and after IAS 41 adoption in 2005. The variables are described in Appendix. *, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively.

Table 5. The effect of IAS 41 adoption on stock price synchronicity

Panel A: Pooled Regression

	Pred. Sign	Dep. Var.=*SYNCH* (1)	(2)	(3)
Intercept		-2.315***	-2.409***	0.975
		(0.000)	(0.000)	(0.104)
POST		0.248***	0.520***	0.664***
		(0.000)	(0.000)	(0.000)
IAS41Change		-0.040	-0.030	0.542
		(0.359)	(0.486)	(0.109)
POST×IAS41Change	**−**	**-0.184*** **	**-0.201*** **	**-0.207*** **
		(0.001)	**(0.000)**	**(0.000)**
SIZE		0.108***	0.102***	0.138***
		(0.000)	(0.000)	(0.000)
LEV		0.080	0.117**	0.010
		(0.136)	(0.026)	(0.852)
StdROA		0.145*	0.170**	0.392***
		(0.064)	(0.030)	(0.000)
SIGMA		-3.906***	-4.480***	-4.236***
		(0.000)	(0.000)	(0.000)
VOL		0.025***	0.024***	0.034***
		(0.000)	(0.000)	(0.000)
ACCR		0.003*	0.002	0.001
		(0.078)	(0.244)	(0.311)
FREQ		-0.026***	-0.050***	-0.004
		(0.007)	(0.000)	(0.727)
GDP		0.091***	0.079***	-0.463***
		(0.000)	(0.000)	(0.000)
Nlist		-0.122***	-0.113***	0.027
		(0.000)	(0.000)	(0.787)
Year fixed effect		No	Yes	Yes
Country fixed effect		No	No	Yes
Observations		5,028	5,028	5,028
Adjusted R^2		0.161	0.224	0.295

Panel B: Two-by-Two analysis of the change sample versus no-effect sample, by period, using the coefficients in Column (3) of Panel A

	2000-2004	**2005-2009**	**DIFF**
IAS41 change sample	1.517	1.974	0.457
IAS 41 no-effect sample	0.975	1.639	0.664
DIFF	0.542	0.335	-0.207

Table 5 presents the regression result of the impact of IAS 41 adoption on firm-level stock price synchronicity. Panel A reports the pooled regression coefficients. Panel B reports the two by tow analysis. The variables are described in Appendix.*, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. All reported t statistics are based on standard errors adjusted for clustering at the firm level. Column 1 does not control for year and country fixed effects. Column 2 controls only for year fixed effects. Column 3 controls both for year and country fixed effects.

Table 6. The effect of IAS 41 adoption on stock price synchronicity: bearer plants and other biological assets

	Pred. Sign	Dep. Var.=*SYNCH* (1)	(2)	(3)
Intercept		-2.312***	-2.067***	0.540
		(0.000)	(0.000)	(0.852)
POST		0.087	0.093	0.110
		(0.163)	(0.402)	(0.451)
BearerPlant		-0.090	-0.090	-0.091
		(0.227)	(0.208)	(0.214)
POST×BearerPlant	?	-0.021	-0.007	-0.007
		(0.834)	(0.945)	(0.945)
SIZE		0.093***	0.072***	0.089***
		(0.000)	(0.000)	(0.000)
LEV		0.100	0.134	-0.010
Table		(0.535)	(0.396)	(0.951)
StdROA		0.119	0.055	0.037
		(0.319)	(0.629)	(0.752)
SIGMA		-1.448*	-2.566***	-2.865***
		(0.078)	(0.002)	(0.002)
VOL		0.079**	0.116***	0.087**
		(0.027)	(0.001)	(0.018)
ACCR		0.003	0.002	0.001
		(0.444)	(0.674)	(0.851)
FREQ		0.076**	0.085**	0.130***
		(0.023)	(0.013)	(0.003)
GDP		-0.006	-0.002	-0.191
		(0.837)	(0.958)	(0.356)
Nlist		0.004	-0.001	-0.115
		(0.914)	(0.983)	(0.519)
Year fixed effect		No	Yes	Yes
Country fixed effect		No	No	Yes
Observations		712	712	712
Adjusted R^2		0.137	0.213	0.238

Table 6 presents the regression result of the impact of IAS 41 adoption on firm-level stock price synchronicity between bearer plants and other biological assets. The variables are described in Appendix.*, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. All reported t statistics are based on standard errors adjusted for clustering at the firm level. Column 1 does not control for year and country fixed effects. Column 2 controls only for year fixed effects. Column 3 controls both for year and country fixed effects.

Table 7. The effect of IAS 41 adoption on stock price synchronicity: between high-level and low-level of asset importance

		Dep. Var.=*SYNCH*					
	Pred. Sign	***High*=% of total assets**			***High*=% of net income**		
		(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Intercept		-2.308***	-2.059***	0.401	-2.331***	-2.086***	0.319
		(0.000)	(0.000)	(0.890)	(0.000)	(0.000)	(0.913)
POST		0.073	0.087	0.110	0.110*	0.121	0.129
		(0.281)	(0.431)	(0.453)	(0.075)	(0.269)	(0.368)
HIGH		0.014	0.009	-0.017	0.074	0.063	0.006
		(0.844)	(0.899)	(0.811)	(0.346)	(0.390)	(0.936)
POST×HIGH	—	0.020	0.017	0.007	-0.068	-0.066	-0.047
		(0.839)	(0.854)	(0.940)	(0.498)	(0.490)	(0.621)
SIZE		0.091***	0.070***	0.086***	0.092***	0.071***	0.087***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LEV		0.107	0.141	0.004	0.102	0.135	-0.004
		(0.509)	(0.383)	(0.983)	(0.528)	(0.402)	(0.983)
StdROA		0.134	0.066	0.047	0.145	0.075	0.046
		(0.263)	(0.560)	(0.684)	(0.231)	(0.512)	(0.691)
SIGMA		-1.399*	-2.524***	-2.806***	-1.320	-2.453***	-2.794***
		(0.094)	(0.003)	(0.002)	(0.121)	(0.004)	(0.003)
VOL		0.082**	0.119***	0.088**	0.083**	0.120***	0.088**
		(0.023)	(0.001)	(0.018)	(0.022)	(0.001)	(0.018)
ACCR		0.004	0.002	0.001	0.003	0.002	0.001
		(0.399)	(0.620)	(0.825)	(0.416)	(0.634)	(0.807)
FREQ		0.088***	0.096***	0.137***	0.088***	0.097***	0.137***
		(0.008)	(0.004)	(0.002)	(0.007)	(0.004)	(0.001)
GDP		-0.006	-0.001	-0.185	-0.005	-0.000	-0.177
		(0.853)	(0.978)	(0.372)	(0.863)	(0.992)	(0.395)
Nlist		-0.006	-0.009	-0.104	-0.008	-0.011	-0.106
		(0.857)	(0.770)	(0.559)	(0.799)	(0.722)	(0.554)
Year fixed effect		No	Yes	Yes	No	Yes	Yes
Country fixed effect		No	No	Yes	No	No	Yes
Observations		712	712	712	712	712	712
Adjusted R^2		0.132	0.209	0.235	0.133	0.210	0.235

Table 7 presents the regression result of the impact of IAS 41 adoption on firm-level stock price synchronicity between high-level and low-level of asset significance. The variables are described in Appendix.*, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. All reported t statistics are based on standard errors adjusted for clustering at the firm level. Column 1-3 relate to assets importance measured relative to total assets; Column 4-6 relate to asset importance measured relative to net income. Column 1 and 4 do not control for year and country fixed effects. Column 2 and 5 control only for year fixed effects. Column 3 and 6 control both for year and country fixed effects.

Table 8. The effect of IAS 41 adoption on stock price synchronicity: between high-level and low-level of industrial development of agricultural sector

		Dep. Var.=*SYNCH*	
	Pred. Sign	**(1) High**	**(2) Low**
Intercept		-2.262	-2.331
		(-5.58)***	(-20.66)***
POST		0.343	0.228
		(4.91)***	(9.36)***
IAS41 Change		0.217	-0.075
		(2.00)*	(-1.46)
POST×IAS41Change	—	-0.414	-0.123
		(-3.23)**	(-1.90)*
SIZE		0.081	0.113
		(3.72)***	(15.69)***
LEV		0.067	0.075
		(0.61)	(1.63)
StdROA		0.053	0.141
		(0.26)	(1.53)
SIGMA		-3.743	-4.119
		(-4.57)***	(-10.71)***
VOL		0.019	0.027
		(1.64)	(6.66)***
ACCR		0.002	0.003
		(0.53)	(1.62)
FREQ		0.003	-0.030
		(0.12)	(-3.02)**
GDP		0.033	0.086
		(0.80)	(8.29)***
Nlist		-0.024	-0.121
		(-0.45)	(-8.77)***
Year fixed effect		Yes	Yes
Country fixed effect		Yes	Yes
Observations		609	4511
Adjusted R^2		0.153	0.159

Table 8 presents the regression result of the impact of IAS 41 adoption on firm-level stock price synchronicity between high-level and low-level of industrial development of agricultural sector. The variables are described in Appendix.*, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. All reported t statistics are based on standard errors adjusted for clustering at the firm level. Column 1 relates to high level of industry developments, and Column 2 relates to low level of industrial development. Column 1 and 2 control both for year and country fixed effects.

Table 9. The effect of IAS 41 adoption on stock price synchronicity: between treatment sample and IFRS adopters that have no biological assets as control group

	Pred. Sign	Dep. Var.=*SYNCH* IFRS adopters as control group
Intercept		-2.576
		(-20.46)***
POST		0.191
		(7.61)***
IAS41 Change		-0.047
		(-0.76)
POST×IAS41Change	**—**	**-0.186**
		(-3.46)* **
SIZE		0.122
		(16.29)***
LEV		0.082
		(1.79)
StdROA		0.069
		(0.78)
SIGMA		-3.698
		(-9.77)***
VOL		0.025
		(5.97)***
ACCR		0.002
		(1.50)
FREQ		-0.034
		(-3.17)**
GDP		0.105
		(9.87)***
Nlist		-0.121
		(-8.32)***
Year fixed effect		Yes
Country fixed effect		Yes
Observations		4,082
Adjusted R^2		0.175

Table 9 presents the regression result of the impact of IAS 41 adoption on firm-level stock price synchronicity using IFRS adopters that have no biological assets as control group. The variables are described in Appendix.*, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. All reported t statistics are based on standard errors adjusted for clustering at the firm level.

Table 10. The effect of IAS 41 adoption on stock price synchronicity: limiting firms with the value of total biological assets above 5% of total assets

	Pred. Sign	Dep. Var.=*SYNCH* IFRS adopters as control group
Intercept		-1.457
		(-5.89)***
POST		0.0519
		(0.362)
IAS41 Change		-0.110
		(0.140)
POST×IAS41Change	−	**-0.178****
		(0.030)
SIZE		0.0686***
		(0.000)
LEV		0.275***
		(0.000)
StdROA		-0.00574***
		(0.000)
SIGMA		-4.151***
		(0.000)
VOL		0.0271***
		(0.000)
ACCR		-26.59***
		(0.000)
FREQ		0.195***
		(0.000)
GDP		-0.0441***
		(0.000)
Nlist		0.0994***
		(0.000)
Year fixed effect		-0.116***
Country fixed effect		(0.000)
Observations		3091
Adjusted R^2		0.229

Table 10 presents the regression result of the impact of IAS 41 adoption on firm-level stock price synchronicity with the treatment sample limited to firms with the value of total biological assets above 5% of total assets. The variables are described in Appendix.*, **, *** Indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. All reported t statistics are based on standard errors adjusted for clustering at the firm level.