
COMPARABILITY OF IFRS INFORMATION: A CROSS-COUNTRY ANALYSIS OF FOREST ASSETS

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ABSTRACT

The comparability of financial information is one of the qualitative characteristics provided for in international accounting standards. Studies have indicated that this characteristic may be absent even among entities of the same segment or with the same type of asset, due to the accounting choices allowed by accounting standards. Thus, the present research aims to analyze the comparability of accounting choices between similar ones in the disclosure of forest assets. Data were hand collected from the financial statements and notes in two periods (48 reports), from three Latin American countries (Brazil, Argentina and Chile). The method was content analysis for each accounting choice evidenced in the financial statements and the notes. The results indicate a reduced degree of comparability of financial information, especially due to the lack of information about each choice over time. There was a diversity of options adopted by the companies to present the forests and the gains/losses disclosed in the financial statements. The limitations in the comparability of financial information between entities that operate identical assets under IFRS, anchored in the excessive generality of the standard, suggest the need for improvements in the IAS 41 standard.

Keywords: Accounting choices. Disclosure. Financial report. Forest. Comparability.

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COMPARABILIDADE DAS INFORMAÇÕES EM IFRS: UMA ANÁLISE CROSS-COUNTRY DE ATIVOS FLORESTAIS

RESUMO

A comparabilidade da informação financeira é uma das características qualitativas previstas nos padrões internacionais. Estudos têm sinalizado que essa característica pode estar ausente até entre entidades de um mesmo segmento ou com um mesmo tipo de ativo, em função das escolhas contábeis permitidas pelas normas de contabilidade. Assim, a presente pesquisa tem o objetivo de analisar a comparabilidade das escolhas contábeis entre semelhantes na evidenciação de ativos florestais. Os dados foram coletados manualmente das demonstrações financeiras e notas explicativas em dois períodos (48 relatórios), de três países da América Latina (Brasil, Argentina e Chile). A metodologia usada foi a análise de conteúdo para cada escolha contábil evidenciada nas demonstrações financeiras e notas explicativas. Os resultados sinalizam reduzido grau de comparabilidade da informação financeira, especialmente, em função da ausência de informações sobre cada escolha ao longo do tempo. Verificou-se diversidade de opções adotadas pelas empresas para apresentação das florestas e dos ganhos/perdas divulgados nas demonstrações financeiras. As limitações na comparabilidade da informação financeira entre entidades que operam ativos idênticos sob IFRS, ancoradas na excessiva generalidade na norma, sugerem a necessidade de aprimoramentos no padrão IAS 41.

Palavras-Chave: Escolhas. Divulgação. Relatório financeiro. Florestas. Comparabilidade.

1 INTRODUCTION

The adoption of IAS 41 - Agriculture in the early 2000s for the accounting of biological assets represents a milestone in the accounting practices applied to these assets, which were essentially represented by the use of historical cost (Argilés et al., 2011; Rabassi et al., 2020). Supported by the peculiarities of these assets - especially biological transformation - IAS 41 aims to recognize the economic essence by determining measurement at fair value (Bohušová et al., 2012; Budrionyte & Gaizauskas, 2018).

However, various challenges in operationalizing the requirements of the standard arose in entities and manifested themselves in the diversity of procedures for presenting financial reports - suggesting limitations in comparability between companies (Ganassin et al., 2016; Monico et al., 2020; Salotti & Santos, 2015). Different choices among entities that work with biological assets may be based on various justifications, among them, the existence of assets without a market price/reference, requiring the use of manager assumptions and inputs, with a high degree of discretion (L. Y. (Colly) He et al., 2021; Machado et al., 2014). However, differences in accounting choices between entities diverge from the objective of international standards, which aim to represent a single and simple accounting

language for businesses (comparable), as well as to reduce international reporting and capital costs (IASB, 2018).

Another foundation for the diversity of procedures relies in the options that international standards allow to capture the true and fair view of the entity - since phenomena in each entity must be faithfully represented (Argilés-Bosch et al., 2018; Budrionyte & Gaizauskas, 2018; Cavalleiro, Gimenes, & Binotto, 2019). Identical biological assets can generate different phenomena due to operational characteristics, types, and destination of the assets. Choices in the context of international standards can be exercised with a certain degree of management subjectivity - such as the definition of discount rate, cash flow (asset measurement at level 3), and the asset classification in the balance sheet (L. Y. (Colly) He et al., 2021; J. da S. Oliveira et al., 2015; Stárová et al., 2016), compromising the comparability of financial information.

Research has documented that, despite the increase in information volume after the application of the standard, the mandatory disclosure level for biological assets has been partial at the beginning of the adoption of IFRS, and the disclosed information was superficial (Barros et al., 2012; Figueira & Ribeiro, 2015; Theiss et al., 2014) - which could compromise the analysis of users and their decisions (Carvalho et al., 2013; Scherch et al., 2013). These studies, in the initial period of adoption of the standard in the Brazilian context, cite the possible explanation for the low level of disclosure as the entities' experience phase with IFRS. However, research conducted in the years following adoption sought to verify if there were significant improvements in the level of disclosure in various segments, and found that the changes are limited and that the low level of compliance for disclosure persists (Tortoli et al., 2018), with the practice of repeating texts in the notes of biological assets from one period to another being common (Monico et al., 2020; Talaska & Oliveira, 2016).

The predominant feature in research on biological asset accounting is the analysis of disclosure by entities operating in different segments within the same sample (e.g., Ganassin et al., 2016; Talaska & Oliveira, 2016). These entities operate with different biological assets, for different purposes, in peculiar markets (e.g., available price versus marketless asset; international versus national market), and with different levels of information on assets measured through diverse procedures (Huffman, 2018; J. da S. Oliveira et al., 2015).

However, the examination of comparability of accounting information from companies that hold a specific biological asset has not been sufficiently explored in the literature. Therefore, it may be possible to verify whether the accounting standards in a segment, whose main asset dominates most production stages, allows different ones to look different and similar ones to appear similar. According to IASB (2018), for information to be comparable, similar things should look similar, and different things should look different. Observing similar biological assets presupposes similar choices by managers.

Therefore, the research aims to analyze the comparability of disclosure and presentation choices for forest assets. To achieve the objective, financial information comparability was analyzed between 24 companies that hold forest asset balances on their balance sheets in three Latin American countries (Brazil, Argentina, and Chile), during the periods of 2011 and 2020. In this research,

presentation choices for assets are understood as related to the recognition of assets or related elements (e.g., adjustment to fair value) directly in the accounting reports. Disclosure choices are those that appear in notes of financial statements.

The choice of entities that operate with forests is justified by three aspects: i) the economic representativeness of the industry (paper/cellulose, wood) (IBA, 2019); ii) the high degree of discretion/subjectivity in the measurement, disclosure, and presentation of reports on these biological assets (Machado et al., 2014; Pereira et al., 2020), given their particularities, such as the long production cycle and the lack of an active market for measuring growing forests (Acuña et al., 2020; Ortiz & Oliveira, 2020); and iii) the absence of consensus on the main elements of forest accounting across countries, such as measurement criteria, disclosure procedures, and presentation form in financial statements (Bohušová et al., 2012; Budrionyte & Gaizauskas, 2018; Giertliova et al., 2017; Herbohn & Herbohn, 2006; Stárová et al., 2016).

This study seeks to contribute to the literature by discussing the comparability of accounting information within a specific segment whose assets are similar, respecting the characteristics of the assets and strategies of each company. In particular, it contributes to the specific literature on biological assets by examining the comparability of the disclosure and presentation of forest assets. From the perspective of users of accounting information, the research contributes by analyzing companies' choices regarding the disclosure of biological assets, whether in financial statements or notes. Such analysis can be useful in the decision-making process, both for preparers and auditors or analysts, by identifying aspects that require greater attention in the financial statements of companies in the sector. For standard-setters and accounting oversight organizations, this research contributes by demonstrating the need to improve the recognition and disclosure process for assets whose cash flow generation carries similarities.

2 ACCOUNTING CHOICES, DISCLOSURE, AND FINANCIAL REPORTING

The following subsections discuss accounting choices and the comparability of information (2.1), as well as specify the research choices, which are drawn from literature and accounting standards, in the dimensions of 'disclosure' and 'financial reports' (2.2.1 and 2.2.2).

2.1 Accounting choices and comparability of information

Accounting choices have been studied in various contexts, such as: adoption of asset measurement methods (Cairns et al., 2011; Pinto et al., 2015); analysis of requirements for recognition of intangibles (Colla et al., 2019); association between the profile of managers and financial statement preparers with accounting choices (Almeida & Lemes, 2019; Cavalheiro, Gimenes, & Binotto, 2019); and impacts of choices on results (L. Y. (Colly) He et al., 2021).

The concept of accounting choices is also broad, encompassing decisions within the same measurement basis, disclosure strategies, information context (financial, tax), etc. According to Fields et al. (2001, p. 256), "An accounting choice is any decision whose primary purpose is to influence [...] the output of the

accounting system [...] published financial statements, [...] tax returns, and regulatory filings."

In the accounting of biological assets, choices are in the context of measurement methods and techniques (fair value or cost), extending to disclosure and financial reporting. According to IAS 41, biological assets should be measured at fair value less costs to sell at the measurement date (IASB, 2009). However, there are alternatives that could represent management choices, such as: i) the assumptions of fair value measurement disclosure; ii) sensitivity of measurement involving future cash flows at present value; and iii) recognition of assets, revenues/expenses in accounting reports (D. de L. Oliveira & Oliveira, 2020b).

The greatest number of choices (or the most subjective ones) occur in segments with assets without an active market, whose fair value estimate is at level 3 of the hierarchy (IFRS 13 - fair value measurement, applied from 2013), which requires a specific evaluation technique - such as forests and standing sugar cane (Acuña et al., 2020; Cavalheiro, Gimenes, Binotto, et al., 2019). In these cases, choices are focused on defining evaluation assumptions based on internal data generated by managers, such as the amount of future cash flows (revenues minus expenses) in each year of the asset's useful life, discount rate, asset growth rate, among others (L. He, 2020; Lento et al., 2018; Pereira et al., 2020). The evaluation of these assets is subject to conflicts between participating agents (preparers of demonstrations, evaluators, auditors), usually built based on a consensus around assumptions to estimate fair value (Machado et al., 2014).

For cases of measuring assets for production or long-term assets, studies present that disclosures help in understanding the ability to generate future cash flows of assets, especially when measured by techniques that use data not observable by the market. In these cases, disclosure plays the role of complementing the information recognized in financial reports, giving it greater relevance and reliability (Gonçalves et al., 2017; Nogueira & Pires, 2017). However, research on biological asset disclosure indicates that the level of disclosure by entities is considered superficial (Monico et al., 2020; Talaska & Oliveira, 2016) and the information is insufficient to know the process of asset evaluation at level 3 of the fair value hierarchy (Pereira et al., 2020).

Both choices around level 3 measurement and choices about biological asset disclosure bring difficulties for the user to compare the financial information of entities in the segments (J. da S. Oliveira et al., 2015; Stárová et al., 2016), either because the choices are different or because of the absence of detailed information on the measurement and classification of assets (Talaska & Oliveira, 2016). The choices are also present in the presentation of biological assets in financial reports, especially in groups and subgroups of the balance sheet (Budrionyte & Gaizauskas, 2018) and the income statement (Figueira & Ribeiro, 2015), which could affect financial indicators and compromise, to some extent, the comparability of the statements.

2.2 Choices in disclosure and presentation of biological assets without market value

Based on a review of the literature and accounting standards related to biological assets - plants (IAS 41 - Agriculture, IFRS 13 - Fair Value Measurement, IAS 1 - Presentation of Financial Statements), this study defines and structures accounting choices in two dimensions: i) disclosure of forest assets (2.21); ii) presentation of financial reports for forest assets (2.2.2). These choices are presented with the objective of supporting the analysis of elements presented in the companies of the sample in this research.

2.2.1 Choices in disclosure of forest assets

1-a) Information on asset measurement (fair value inputs). Forest operation-derived assets, mainly from agroforestry systems, are generally measured with unobservable data by discounted cash flows at present value (Macedo et al., 2015). Given the conflict scenario among stakeholders (financial statement preparers, appraisers, and auditors) in the measurement of biological assets, based on unobservable data (level 3), consensus is required among the parties involved to carry out the recognition, measurement, and evidence of assets and ensure reliability and relevance of the generated information (Machado et al., 2014). To ensure accounting reliability by external users, it is expected that companies disclose the main information inherent to the evaluation process, such as the discount rate adopted, future cash flow assumptions, price sources, physical estimates of the evaluated asset (Cavalheiro, Gimenes, & Binotto, 2019; Pereira et al., 2020), among others.

1-b) Reconciliation of fair value at the beginning and end of the period. IAS 41 provides for the disclosure of items and values that affect the initial fair value of the asset during the year (items 51a-e), as well as the final fair value of the asset (IASB, 2009). The detail of this reconciliation enables financial information users to understand the main movements in the value of biological assets (purchases, sales, harvesting/cutting, gains/losses, combination, etc.). Studies on the disclosure (or not) of reconciliation information in the notes present mixed results for agribusiness companies (R. L. M. Silva et al., 2013; Theiss et al., 2014).

1-c) Fair value sensitivity to changes in unobservable data. IFRS 13 (item 93(h)(i)) requires entities to disclose the sensitivity of the fair value assessment of assets at level 3, based on changes in unobservable inputs (e.g., discount rate, cash flows). Therefore, it is of interest to financial information users to know the impact of the rate variation on the fair value of biological assets and the influence of the fair value adjustment on the result, given the sensitivity of the discounted cash flow to the rate (Machado et al., 2014).

1-d) Type of biological asset. Regarding the types of assets provided in item 44 of IAS 41, it is a common practice among Brazilian companies in various sectors, according to Macedo et al. (2015), to not separate assets into consumable and productive. Approximately 16% of companies only disclosed this information in 2013. This classification is generally associated with the asset's intended use as defined by management and its intrinsic characteristics (Huffman, 2018), and therefore relevant information for external users to understand the entity's activity and predict cash flows according to their interests.

1-e) Segregation of assets by maturity. IAS 41 recommends that assets be segregated into mature and immature in reports (notes). This recommendation is especially important for long-cycle assets, where information users can track the stage of the entity's assets. Ortiz and Oliveira (2020) propose an account scheme for the forestry segment, where this segregation is performed within the balance sheet. However, it should be noted that studies have found that such segregation is one of the least disclosed items in the notes of entities (Figueira & Ribeiro, 2015; R.L.M. Silva et al., 2013).

1-f) Segregation of assets by species. IAS 41 (item 41) provides for the description of each group of biological assets in the notes (D. de L. Oliveira & Oliveira, 2020b). Accounting information by species can contribute to external users' analysis of investments and project viability, useful for their cash flow projections. In research in Latin America, Ganassin et al. (2016) found that there are companies in Argentina and Brazil that do not properly disclose either the species of their assets or their measurement bases.

2.2.2 Financial Report Choices: Presentation and Classification

2-a) Classification of biological assets (Balance Sheet). The separation of biological assets in the balance sheet into current and non-current assets is defined based on the difference in the duration or nature of the economic benefits of the assets (Scott, Zinkeviciene et al., 2019). In some cases, even when adopting international standards for certain types of companies, there are national standards with specific guidance on the presentation and classification of assets. This is the case in Romania, where the standard indicates the accounts for the classification of biological assets (Raluca, 2014), and in Brazil, where the Securities and Exchange Commission (CVM) requires standardized financial statements (CVM, 2021). It is noteworthy that long-term maturing biological assets can be classified as current or non-current assets, depending on the production strategy, use, or destination of the assets (D. de L. Oliveira & Oliveira, 2019; Ortiz & Oliveira, 2020).

2-b) Sub classification of biological assets (subgroup). Budrionyte and Gaizauskas (2018) identified that standing forests are classified as inventory (68.9%) or as property, plant, and equipment (PPE) (29.31%). According to these authors, the most appropriate classification is as PPE, considering that forests have a long development period until harvesting (over 10 years), are not assets that have liquidity like short-term assets, and generate revenue only at the time of harvesting. This treatment can be justified for cases where forests generate co-products, such as resin gum, thinned trees, and cut trees. Ortiz and Oliveira (2020) highlight that regarding the implementation costs in the pine forest (e.g., soil preparation, stump removal, cleaning, planting), these costs will benefit the production of multiple forest products in various periods in the future, with relevant revenues, which would justify their recognition according to IAS 16. However, in the discussion of Bearer biological assets in 2014, the IASB considered that the main product of forest assets was cut wood and, with this, defined that such assets continued to be accounted for based on IAS 41 - Agriculture. This was the treatment found by Tang et al. (2013) and Xie et al. (2019) in the analysis of Chinese companies. The authors verified that

forests were classified as consumable biological assets, in the subgroup of inventory, and measured at fair value.

2-c) Classification of agricultural product (Balance Sheet). According to Grege-Staltmane (2010), the agricultural product (cut tree) should be recognized as a current asset. However, in the literature, there is a diversity of procedures for classifying similar assets into different subgroups by companies (Ducati et al., 2019; Tang et al., 2013). It is also noteworthy that vertical agribusiness companies (that produce and process the biological asset) do not recognize/measure the agricultural product at the time of harvesting, as they insert the harvested product directly into the production process, without exhibiting gains or losses at this stage of the production process (D. de L. Oliveira et al., 2020), as provided for in items 13 and 29 of IAS 41 (IASB, 2009).

2-d) Presentation of gains/losses at fair value in the Income Statement. In the first years of adopting IAS 41 in Brazil (2010-2012), most companies with biological assets did not exhibit the account in which they recorded gains/losses at fair value. Those who did used accounts such as fair value change of biological assets, net adjustment of fair value of biological assets, among other accounts. Some of these companies exhibited the variation within the "Operating Revenue" or "Cost of Goods Sold" group (Figueira & Ribeiro, 2015; Salotti & Santos, 2015).

Although under the Conceptual Framework the fair value adjustment has a revenue/expense nature, it does not represent revenue from contracts with customers (e.g., sales revenue, services revenue) under IFRS 15, as there are no transactions with third parties with transfer of risks and benefits of the asset. Similarly, losses due to fair value adjustments do not seem to be related to the cost of sales for the period, as the assets remain in the entity. There are reports of companies that classify the adjustment in "Other Operating Revenue/Expenses" (Salotti & Santos, 2015). However, as it is a relevant item for the understanding of the entity's performance, for IAS 1, the most recommended procedure would be the classification in a separate line in the Income Statement.

3 METHOD

3.1 Research procedure

In order to identify and compare accounting choices of entities with similar biological assets, the research is conducted with listed companies that operate with forests. The premise is that differences between segments could interfere with the analyzed accounting phenomena, hindering comparisons of accounting choices between entities (Lourenço et al., 2018). Thus, it is considered as a presupposition that the comparability of disclosure policy and financial reporting choices can be better analyzed using a sample of entities with similarities (e.g., types of assets, business sector), such as companies in a biological asset segment (Maruli & Farahmita, 2011).

Although the pulp and paper and the wood segments have similarities, there are notable differences in business models, considering that the first segment could focus on supplying processed wood and the second segment on supplying furniture, raw wood, matches, toys, etc., as evidenced by the sample. However,

the sample definition is centered on the accounting treatment of the biological asset 'forests' and their products.

Additionally, the companies' business model would affect the accounting choices. However, forests meet the biological asset concept brought by IAS 41. In this case, the recognition, measurement and disclosure requirements provided in the accounting standard are independent of the business model. This can be seen through reading the entities' notes, in which accounting choices are justified for reasons other than the model. The results also indicate that the accounting treatment of forests has similarities across business segments (e.g., measurement at fair value using discounted cash flow). The authors argue that improvements could be made in the accounting standard regarding the recognition, measurement and disclosure of biological assets, in order to recognize particularities of the entities' business model (vertical production versus forests for wood sales) in accounting choices, as already indicated in the literature (Pereira et al., 2020).

This research adopts an archival data approach, in which the financial statements and the notes are analyzed in each period. The accounting reports of two extreme periods between 2011 and 2020 are considered, with a view to analyzing consistency in choices within entities over time. These reports capture managers' accounting choices, whether those provided for in the accounting standard or those that lack conformity.

Studies on accounting choices have adopted archival data to understand entities' policy decisions regarding the accounting of assets (Botinha & Lemes, 2017; Hadiyanto et al., 2018). The authors searched for possible effects of the change in IAS 41 regarding the measurement of bearer plants (IASB, 2013) on the analyzed choices. As of 2016, these plants came under the scope of IAS 16 - Property, Plant and Equipment. It was possible to verify that the change in the measurement basis of bearer plants (from fair value to cost) did not affect any of the analyzed choices, considering that the sample companies did not have forests classified as bearer plants between 2011 and 2020. Additionally, it was observed that the analyzed choices do not vary from one year to another, which justifies the cutoff of two extreme periods for analysis (2011 and 2020).

The cross-country perspective makes it possible to empirically analyze the achievement of the IASB accounting standards' purposes, mainly with regard to "contributing to transparency by improving the international comparability of financial information" (IASB, 2018).

3.2 Sample, Data Collection, and Analysis

The Latin American countries (Brazil, Argentina, and Chile) were chosen because they are concentrated in regions with a vocation for agroforestry activities, which have already been studied in previous research (e.g., Ganassin et al., 2016), and have adopted IFRS during the analysis period. This theoretically allows for comparability of choices. In addition, these countries have the largest reforestation areas in the region, based on the FAO - Food and Agriculture Organization report (FAO, 2021). Together, these three countries have more than 15 million hectares of planted forests. Furthermore, these countries have a

significant number of listed companies with disclosed accounting information during the analyzed period.

The sample and data collection were preceded by the following procedures: i) identification of listed companies with biological assets in their balance sheets between 2011-2020 in the three countries; ii) location of the financial statements and the notes of each entity; iii) access to the reports of each company per year. The procedures occurred differently in each country, considering the level of information available on the stock exchanges or corporate websites.

For the identification of listed companies in Chile, the list of the country's 500 largest companies, available in 2019 (Economía, 2019), was used due to the impossibility of accessing the list of entities by segment on the Santiago Stock Exchange website (Bolsa de Santiago, 2021). Then, seven listed companies with operations in the 'Pulp/Paper' sector were identified.

Regarding the listed companies in Argentina, the analysis of the operations of the entities on the stock exchange was carried out individually for each company (Investing.com, 2021), in order to identify those that operate with forests due to the unavailability of data by segment on the Buenos Aires stock exchange. This analysis resulted in three companies that meet the sample requirements (e.g., operation with forests). These companies maintain forests, such as biological assets provided for in IAS 41, and use them for the productive process of various products, including paper and pulp, food and drug wrappers, printing and writing paper, tabletops and furniture, energy/fuel, and transportation.

For Brazilian companies, Brazilian Stock Exchange B3 (Brazil, Bolsa, Balcão) provides information by segment. This allowed for the identification of six entities in the paper and pulp segment and two entities in the wood segment. Among the six companies in the paper and pulp segment, one company was excluded because it was controlled by another entity in the segment, leaving only the controlling company in the sample. In addition, considering the possibility of diversified biological assets in the entities, the financial statements of other companies classified in the non-cyclical sector of the stock exchange were analyzed to find entities that have forest balances in their balance sheets. This procedure resulted in nine more companies in the sample.

The sample was refined by consulting the financial statements, and only the companies that had forest balances in their balance sheets for at least two years between 2011-2020 remained. Thus, the sample is composed of 24 companies (16 listed in Brazil, five in Chile, and three in Argentina).

In the sample, 15 entities operate specifically in the pulp and paper and wood industry, with diversified activities such as panel production, paper and other wood derivatives, laminates, sale of raw wood, match production, among others. These entities predominantly have a verticalized production system (integration between forests and agribusiness within the same entity), with the sale of raw wood being a marginal activity in some companies. The main cultivated species are pine and eucalyptus, and to a lesser extent poplar (a lightweight wood for toy and match production, etc.). The nine companies from other sectors operate in subsets, such as meat and derivatives, fabrics, clothing and footwear, steel,

waterway transport, banks, agricultural construction machinery and equipment. The list of companies is available with the authors.

To access the financial statements and the notes of the listed entities from 2011 to 2020, the authors referred to the corporate websites of the respective entities (Chile and Argentina) or directly to the country's stock exchange (Brazil). Accounting choices regarding disclosure and presentation of financial reports are manually collected and treated through content analysis (Bardin, 2016) of the statements and the notes. The categories of analysis, defined a priori, are the choices identified in accounting standards and in the literature reviewed in section 2.2. For the description of the results, the notes that would have information on biological assets and agricultural products were analyzed, namely: "Inventories", "Long-term Realizable", "Biological Assets" and "Property, Plant and Equipment". Accounting choices were analyzed in two dimensions (e.g., disclosure and report presentation), as recommended by the literature (Colla et al., 2019; D.M. da Silva et al., 2016), since managers could make multiple choices to meet certain purposes (Fields et al., 2001).

The research focused on entities that had forest balances on their balance sheet, in order to analyze the disclosure and presentation choices of these assets in the financial statements. It was assumed that IAS 41 applies to all companies with biological assets regarding the choices analyzed in this research, regardless of activity and segment - although it is recognized that there may be differences in the emphasis of the notes among companies, depending on the business model (e.g. asset allocation, type of cultivated asset). Regarding the application of IFRS 13 - Fair Value Measurement, it is noted that this standard was published in 2012 and applied to financial statements from 2013 onwards (the second period of the sample).

Although the analysis in section 4 focused on the entire sample (24 companies), the potential effects of the segment type were analyzed separately (forest segment sample - 15 companies; other segment sample - 9). These additional results are included in tables in the appendices. Whenever there was a difference between segments, it was mentioned in the specific item of section 4.

4 RESULTS AND DISCUSSION

The analysis of choices in disclosure and presentation of financial reports is presented in subsections 4.2 and 4.3, along with a comparison of the results with the reviewed literature. Subsection 4.4 summarizes the results on consistency and comparability of choices. Subsection 4.1 gathers the main characteristics of the sample in the two periods analyzed (2011 and 2020).

4.1 Sample Demographics

The sample is composed of 24 companies that have forest asset balances in their balance sheet, with 15 companies classified specifically in the paper, pulp and wood segments and nine other companies that operate in various other segments. The 15 companies in the paper, pulp and wood segments produce species of pine, eucalyptus and some produce poplar - a lightweight wood

commonly used in the manufacturing of toys, matches, etc. The remaining 9 companies also operate in varied subsectors such as: hydroviatic transportation, banks, meats and derivatives, textiles, agricultural construction machinery and equipment, clothing and footwear, steel industry.

Two periods were analyzed for each company (2011 and 2020), totaling 48 complete statements in the sample. When the entity did not have information on forests (balances) in the balance sheet or began disclosing after 2011, statements from the year immediately following 2011 or prior to 2020 were analyzed, so that each company has two complete periods in the analysis. Thus, the sample is composed of 24 companies, with 16 listed in Brazil, 5 in Chile, and 3 in Argentina.

The relevance of the entities considered in the sample and the materiality of the forest assets analyzed in the research can be observed from data on the entity's assets and the representativeness of forests in those assets. The total assets of the 24 companies amount to around BRL 655.4 billion in the first analyzed period (BRL 812.3 billion in the second period). Forests in the balance sheet total more than BRL 33.8 billion in period 1 (about BRL 82.3 billion in period 2).

Considering only the 15 companies that operate only in the forestry segment, the total assets in the first period are BRL 147.5 billion (compared to BRL 468.3 billion in the second period). The forest assets of these 15 companies total about BRL 29.1 billion in period 1 and approximately BRL 76 billion in period 2 - a 161% growth in forest balances in about 10 years. The growth of forests is also noted for the entire sample (24 companies) - from BRL 33.8 billion to BRL 82.3 billion (a 143% increase over the period).

The average value of forests among the 15 entities in the forestry segment in period 1 is BRL 1.94 billion (compared to BRL 5.06 billion in period 2). The median forest balance among the companies reaches BRL 615.02 million in period 1 and BRL 417.017 million in period 2. The reduction in the representativeness of forest assets in the total assets of this segment between the two periods (from 19.74% to 16.22%) is explained by the increase in total assets of the companies (217%), which is greater than the growth in the value of forests (161%).

4.2 Choices of biological asset disclosure

a) Information on fair value assessment of the asset. The assessment of forests requires specific inputs for each disclosure period. The main information for determining the value of standing forests is presented in Table 1.

Analysis of the financial statements of Argentine companies allows us to conclude that two companies adopt fair value based on discounted cash flow in both periods under analysis. One of the Argentine companies does not disclose the measurement basis of biological assets in those periods. Among the companies that adopt fair value, only one company discloses inputs (Table 1) for forest assessment.

Among the 11 Brazilian companies that adopt fair value at some point in the forest cycle in the first fiscal year (15 in the second), five do not provide measurement assumptions (two in the second). Another five Brazilian companies

used cost for forest measurement in the first period analyzed (one company in the second period).

For Chilean companies, it was found that four adopt fair value by discounted cash flow and one entity measures forests by cost. The four companies that apply fair value disclose at least one forest assessment assumption in both periods under analysis.

The results exhibit an increase in the disclosure of assumptions, which represents a change from the findings of Figueira and Ribeiro (2015) for the years 2010-2012, in which companies adopting discounted cash flows reduced the disclosure of measurement assumptions for external users, reducing information comparability. R. L. M. Silva et al. (2013) also found that many companies adopt fair value, but do not disclose the method assumptions, impairing the comparability of financial statements and their relevance for users.

Table 1

Inputs disclosed for forest evaluation by country and period ¹.

Evaluation Inputs	Period 1				Period 2			
	Brazil	Arg.	Chile	Total	Brazil	Arg.	Chile	Total
Discount rate	6 ³ out of 11	1 out of 2	2 out of 4	9 out of 17	12 out of 15	1 out of 2	3 out of 4	16 out of 21
Planted area (ha)	5 out of 11	1 out of 2	4 out of 4	10 out of 17	11 out of 15	1 out of 2	4 out of 4	16 out of 21
Wood value (\$/m ³)	4 out of 11	0 out of 2	0 out of 4	4 out of 17	8 out of 15	0 out of 2	0 out of 4	8 out of 21
AAI ²	4 out of 11	0 out of 2	0 out of 4	4 out of 17	5 out of 15	0 out of 2	0 out of 4	5 out of 21
Assets or land remuneration	1 out of 11	0 out of 2	0 out of 4	1 out of 17	2 out of 15	0 out of 2	0 out of 4	2 out of 21

¹ Companies that apply fair value: 17 (1st period) and 21 (2nd period). ² AAI - Annual Average Increment (m³/ha x year). ³ Number of companies that disclose the input among those that adopt fair value.

Source: Research data.

Reading and analyzing the notes that deal with assessment inputs allows us to verify that, although there has been an increase in disclosures, the information presented by the sample entities is not sufficient for the usefulness and relevance of fair value for the user, as already noted by Pereira et al. (2020). For the external user to estimate the entity's future cash flows would require undisclosed inputs (e.g., harvested wood volume, annual forest costs estimated, detailed methodology for defining the discount rate, etc.) - whose disclosure could represent the sharing of strategic information (Machado et al., 2014).

b) Reconciliation of fair value at the beginning and end of the period. The reconciliation of initial and final balances of biological assets (forests) includes information such as purchase value, fair value adjustments, harvest value ("exhaustion"), asset acquisitions by business combination, exchange rate variation in conversions, change of items (e.g., non-current assets to current assets), among others. This reconciliation is useful in both methods (cost and fair value) as it allows the user of the information to understand the movement of biological assets in the period.

In the first exercise, 17 companies disclosed the reconciliation of the initial and final forest balances in the notes. Other companies began disclosing the reconciliation in the second exercise analyzed, reaching 20 companies.

Among the three Argentine companies, two disclose the reconciliation in both periods. Ten of the 16 Brazilian entities that operate with forests present the reconciliation in the notes in the first exercise, and 14 companies do so in the second exercise. One Brazilian company from another sector (meat and meatpacking) also discloses the reconciliation in the first period. Four of the five Chilean companies disclose the reconciliation of forest balances in the notes in both exercises.

This reconciliation is provided for in items 51a-e of IAS 41 (IASB, 2009) and is among the most disclosed information by the companies in the sample. In this sense, progress can be observed in disclosure, in contrast to previous studies that document reduced disclosure of reconciliation information in the initial years of adoption of IAS 41 in Brazil (2010-2012) (Ducati et al., 2019; Theiss et al., 2014). However, the results are consistent with those of Figueira and Ribeiro (2015), who found that from 2010 to 2012, there was growth in the disclosure of reconciliation of the fair value of biological assets, reaching 87% of Brazilian listed companies in 2012.

c) Sensitivity of fair value to changes in unobservable data. Sensitivity refers to the impact that changes in some variables could have on the fair value of the asset (equity) and/or on fair value adjustment (income). Among the 17 entities that adopt fair value for the measurement of forests at some stage of production in the first year, only two Chilean companies provide information on the sensitivity of variables in measuring the fair value of forests. This can be explained by the absence of a specific accounting standard for fair value measurement, given that IFRS 13 - Fair Value Measurement was published in 2012, with effect from 2013. Thus, the companies that disclosed in the first period did so voluntarily. In the second period, two Brazilian entities and four Chilean entities provide information on the sensitivity of measurement (Figure 1).

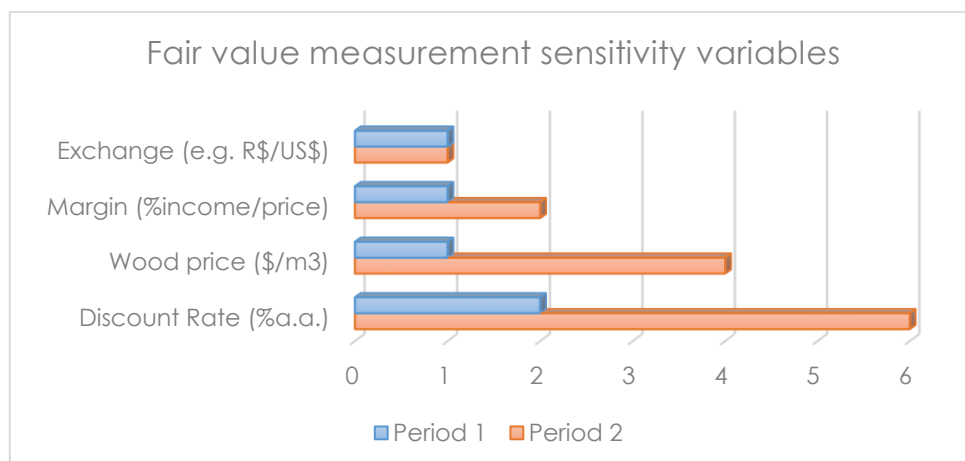


Figure 1 – Variables of sensitivity of fair value assessment.
Source: Research data

Although IFRS 13 (item 93(h)(i)) requires disclosure of the sensitivity of fair value measurement of assets at level 3 based on changes in unobservable inputs (e.g. discount rate, cash flows), disclosure is still minority among companies operating with forests. The greatest disclosure is in the second period (2020), however, only 25% of companies analyze sensitivity in the notes. This analysis could contribute to the reliability of fair value measurement for external users, considering that it is built from consensus among the measurement process agents (Machado et al., 2014).

d) Type of biological asset. In both periods, the classification of forests as consumable or productive biological assets was not identified. Based on the description of forest activities and destination, using the concept of consumable and productive assets (IAS 41, paragraph 44), it is possible to deduce the classification of these assets, but this information is not explicitly stated in the reports. The sample companies generally use forests to generate raw materials for agro-industries, whether vertically integrated or third-party, with trees intended for the sale of logs to sawmills, the manufacture of panels, sheets, toys, and matches, power generation in refrigerators/metallurgies, and so on. Although they have characteristics of consumable biological assets, forest operating entities do not explicitly state this classification in notes. Macedo et al. (2015) also found that Brazilian companies that operate biological assets generally do not separate assets into consumable and productive. Separating assets could indicate to external users the intended use of the asset and its characteristics (Huffman, 2018), which represents relevant information for understanding the activity. It should be noted that the classifications proposed by Xie et al. (2019) - consumable forest biological assets, productive forest biological assets, and public welfare forest biological assets - were also not found among the analyzed companies.

e) Segregation of assets by maturity. In both exercises, only three companies out of the 24 analyzed present the segregation of assets (e.g., mature, immature). An Argentine company separates forests in the notes into the following groups: young assets, assets under development, and mature assets. This company presents the respective values in each group in a comparative manner for the two disclosed exercises. A second company (Brazilian) cites the value of forests destined for raw materials for the production of pulp and paper in its factory. It also explicitly states the amount of trees in formation and mature trees.

[...] The amount of BRL 97,729 (BRL 82,319 as of December 31, 2019) refers to planted forests that are over six years old. The remaining values refer to planted forests in formation, which still require silvicultural treatments. (Irani Papel e Embalagem S.A. company report, 2020).

These company information are presented in both analyzed periods (2011 and 2020). A third non-forestry company (Brazilian) is the only one to inform in the 2020 financial statements that it has "mature standing timber," providing the necessary inputs for the measurement of this asset. The lack of disclosure of asset maturity groups in the notes has also been observed in previous studies (Figueira & Ribeiro, 2015; R. L. M. Silva et al., 2013). The separation between mature and immature biological assets on the balance sheet, as proposed by Ortiz and Oliveira (2020), was also not observed in the survey.

It is worth noting that, although most companies do not explicitly separate assets into mature and immature categories, seven entities (three Argentine and four Chilean) recognize some of their forests as current assets - arguing that they represent forests to be harvested in the subsequent period, which is aligned with the concept of 'current assets' in IAS 1 (D. de L. Oliveira & Oliveira, 2020a).

f) Segregation of assets by species. Although companies report the species of their forests, they do not explicitly disclose the value by species for comparison (e.g., across two fiscal years). An exception is a Chilean company (in the paper and pulp segment) which details the values of its forests for two species, as well as values for nurseries and individual items for agricultural plantations in the notes, compared across two fiscal years.

For some companies, it is possible to conclude that their forests refer to the only species mentioned elsewhere in the report. This was the case for eight companies in the first fiscal year analyzed, with six reporting that their forest assets represented eucalyptus forests (five Brazilian and one Argentinean), without mentioning other species. Two companies reported the cultivation of pine (one Brazilian and one Chilean). Based on this information, it is possible to infer (with some uncertainty!) that the forests on their balance sheets are entirely made up of these species.

It should be noted that IAS 41 (item 41) establishes the description of each group of biological assets in the notes. Separating the value of forests by species is an elementary requirement for understanding the measurement of fair value and the evaluation process, as each species has specific management and use characteristics, especially with regards to the time frames for generating cash flows for each crop (e.g., cutting and thinning points, the moment of generating other agricultural products besides wood). These elements are incorporated in Ortiz and Oliveira's (2020) classification proposal. In line with the results of this research, Ganassin et al. (2016) also found that there are companies in Argentina and Brazil that do not adequately disclose the species of their assets.

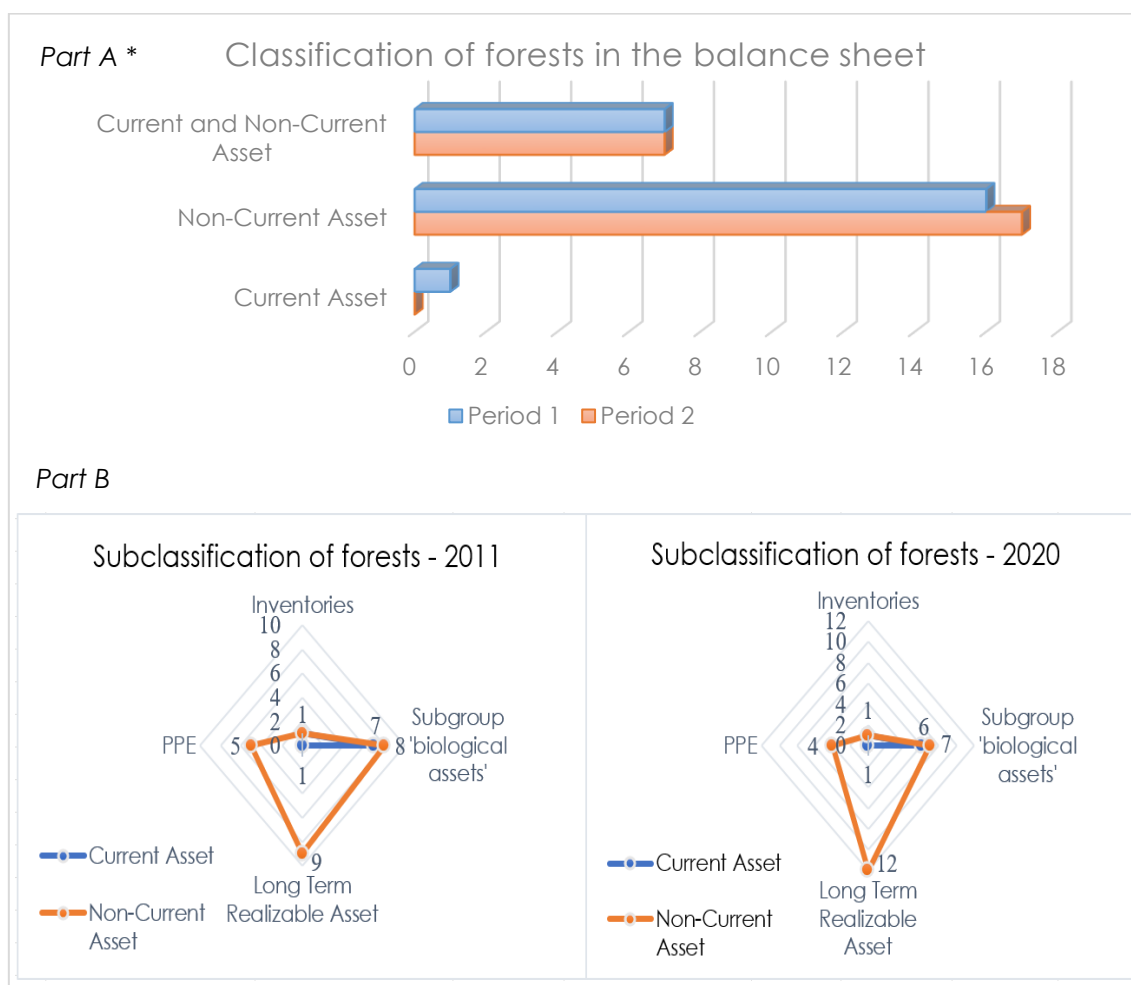
4.3 Choices in the presentation of biological assets

a) Classification and subclassification of forests in the balance sheet. The analysis of reports from both periods makes it possible to observe the diversity of classifications and subclassifications of forests in the balance sheet (Figure 2A). Even in similar operational activities, companies present differentiated treatments of forests, classifying them as non-current assets, as current and non-current assets, or even only as current assets. Most companies in both periods present forests in the non-current assets, and some companies present a portion in the current assets and another in the non-current assets.

According to the narrative of the companies, the amount of forests recognized in the current assets represents the value of the forests that will be harvested in the course of the subsequent period, respecting the asset's purpose (D. de L. Oliveira & Oliveira, 2019). It should be noted that this policy complies with the concept of IAS 1, which defines current assets as "expected to be realized, or intended to be sold or consumed, in the entity's normal operating cycle." This practice (current/non-current separation) is carried out by the three Argentine

companies and four out of five Chilean companies, presenting forests in the 'biological assets' subgroup, after 'inventory' in the balance sheet. The 16 Brazilian companies (including those outside the forestry segment) classify the entire balance of forests as non-current assets in both periods (with the exception of one company in period 1, which recognizes forests only as current assets - Fig. 2A).

Although the presentation of biological assets in the balance sheet depends on the time or nature of the economic benefits of the assets (Zinkeviciene et al., 2019), the form of presentation could be influenced by national norms and requirements, such as the listed Brazilian companies that publish standardized statements required by the Securities and Exchange Commission (CVM), which provides for 'biological assets' classified as non-current assets and current assets (although Brazilian companies classify forests only as non-current assets!). A similar fact was observed in a study of companies in Romania, where there were national standards with specific guidelines on the presentation of assets, even in the face of international standards (Raluca, 2014).



Note: * One company classified forests only in current assets (2011).

Figure 2 – Classification and subclassification of forests in the balance sheet (number of companies).

Source: Survey data.

Predominantly, companies that classify forests as non-current assets place them in long-term assets (9), in the subgroup titled "Biological Assets" (8), or in Property, Plant and Equipment (5) in the first period (Figure 2B). It should be noted that among companies in other sectors with forest balances, there is no classification in the "Biological Assets" subgroup, but only as PPE or long-term assets. Technical Pronouncement CPC 26 (CPC 26 (R1) - Presentation of Financial Statements, 2011) provides for four subgroups for non-current assets: long-term rights, investments, PPE, and intangible assets. However, in some sample companies, the disclosure of long-term "biological assets" outside of these four subgroups, as a specific subgroup, is observed, in compliance with the relevance logic of the information for users' decision-making. Table 2 summarizes the criteria for forest classification and subclassification by country.

Table 2

Classification and subclassification of forests by country.

Part A

Classification of forests	Argentina (P1 and P2)	Brazil (P1 and P2)	Chile (P1 and P2)
Current Asset (only)	0 and 0	1 and 0	0 and 0
Non-Current Asset	0 and 0	15 and 16	1 and 1
Current and Non-Current Asset	3 and 3	0 and 0	4 and 4
Subtotal	3	16	5

Part B

Subclassification of forests	Argentina (P1 and P2)	Brazil (P1 and P2)	Chile (P1 and P2)
<i>Current Asset</i>	<i>3 and 3</i>	<i>1 and 0</i>	<i>5 and 5</i>
Inventory	1 and 1	0 and 0	0 and 0
Subgroup 'biológico assets'	2 and 2	1 and 0	5 and 5
<i>Non-Current Asset</i>	<i>3 and 3</i>	<i>15 and 16</i>	<i>5 and 5</i>
Inventory	1 and 1	0 and 0	0 and 0
Subgroup 'biológico assets'	2 and 2	1 and 0	5 and 5
Long term realizable	0 and 0	9 and 12	0 and 0
Property, Plant and Equipment	0 and 0	5 and 4	0 and 0
Subtotal	3	16	5

Source: Survey data. * P1 and P2: Number of companies in the first and second periods of the analysis.

It is observed that in ten years of application of IAS 41, there has been an increase in the classification of forests as long-term assets, mainly by Brazilian companies: one company stopped classifying in a specific subgroup in the first period and included forests in long-term assets; another company started classifying forests as long-term assets instead of PPE; and a third company, which classified forests in a specific subgroup of current assets, also started classifying forests as long-term assets. An Argentine company classifies forests that will be harvested in the following period as 'inventory'.

The results for the subclassification of standing forests are different from those of Budrionyte and Gaizauskas (2018), who found that these forests are mainly classified as inventory (68.9%) or as PPE (29.31%), the latter being advocated by the authors. As highlighted in the literature review, forests generate the agricultural

product (cut tree) only once, fulfilling the consumable biological asset concept of item 44 of IAS 41 (IASB, 2009) and do not meet the requirements of PPE under IAS 16.

In this case, even if classified as non-current assets, forests would have consumable asset characteristics and not production assets, as indicated by the classification under PPE. This is in line with the findings of Xie et al. (2019) and Tang et al. (2013) in Chinese companies, where they identified forests classified as consumable biological assets in the inventory subgroup of entities or in a specific subgroup called 'biological assets'.

It should be noted that five companies in the sample in the first period (four in the second) still classify forests as PPE, although depreciation is not recognized. The classification as PPE is observed both for Brazilian companies in the forestry segment and in other segments. This choice could deviate from IFRS standards, considering that forests do not periodically produce the agricultural product (e.g., they are not self-renewable) - even those from which resin is extracted, which also do not meet the requirement of bearer plants, as they are sold as agricultural products (cut trees) at the end of the cycle (item 5c, IAS 41). In this case, forests that meet the fixed asset requirements are those not intended for harvesting, which produce fruits/products for more than one period (e.g., trees for leaf use or resin extraction without stem cutting), or forests that allow for multiple cuts (D. de L. Oliveira & Oliveira, 2019).

b) Classification of agricultural product (Balance Sheet). More than half of the companies in both periods did not report the classification of agricultural products on the balance sheet or provided information that suggests they do not classify it on this statement. Although companies may not have balances of these products on the balance sheet due to vertical integration (use in agribusiness), it is expected that they disclose the harvest or variation of the asset and its result in the income statement at the time of harvesting. There was no evidence of this practice in most companies. Ten other companies classified the agricultural product as inventory in the first period. In the second period, 11 companies classified the agricultural product on the balance sheet as inventory, but 13 companies continued the practice of not classifying or not reporting the classification.

Of the three Argentinean companies, one classifies the agricultural product as inventory in the second period and the others do not provide information in both periods. Five Brazilian companies also classify the agricultural product as inventory on the balance sheet, and the other 11 entities do not report or present the agricultural product on the statement in both periods. All five Chilean companies classify the agricultural product as inventory in both periods.

The absence of information on the classification of agricultural products in the balance sheet may be derived from the accounting practice of not recognizing the agricultural products of vertical companies (agribusinesses) that harvest the product and directly launch it into the production process. This procedure, contrary to what is recommended by IAS 41, fails to measure agricultural products at the time of harvest and the consequent determination of gains or losses, reducing the relevance of accounting information for external users (D. de L. Oliveira et al., 2020).

c) Presentation of gains and losses at fair value in the Income Statement. It is observed that there is a diversity of ways to present gains and losses from the measurement of biological assets at fair value in the Income Statement (Table 3), suggesting low comparability of financial statements. About 1/5 of the companies do not inform in which item they recognize the adjustment in the Income Statement.

Table 3

Presentation of forest gains and losses at fair value in the Income Statement for the year.

Presentation of gains and losses	Period 1	%	Period 2	%
Sales revenue	2	8,33%	2	8,33%
cost of goods sold	5	20,83%	5	20,83%
Operating income/expenses	2	8,33%	2	8,33%
Other operating income	6	25,00%	8	33,33%
Measurement at cost	4	16,67%	2	8,33%
does not inform	5	20,83%	5	20,83%
Total	24	100,00%	24	100,00%

Source: Survey data.

There is no standardization among Brazilian and Argentinean companies regarding the presentation of gains and losses in the Income Statement, with all alternatives from Table 3 being present. However, Chilean companies treat gains/losses in a standardized way, in the subgroup "Other operating income" ("Otros ingresos por función").

The results are corroborated by previous studies in Brazil (2010-2012), which found that a large portion of companies with biological assets did not report the gain and loss account for fair value measurement. Those that did so, exhibited the variation within the "Operating Revenue", "Cost of Goods Sold", "Other Operating Income" groups (Figueira & Ribeiro, 2015; Salotti & Santos, 2015).

4.4 Comparability of accounting choices

In general, accounting choices in the disclosure and presentation of forest assets are characterized by a diversity of options among companies in both analyzed periods. Table 4 summarizes comparability elements through the uniformity and consistency of the choices. The detailed statement, with the calculation memory of uniformity and consistency of Table 4, is included in Appendix G.

To calculate uniformity, the predominant choice was considered, which results in disclosed information, even if it is not the most appropriate one. The simple average of uniformity percentages was adopted, even though there is information in subcategories. Uniformity is calculated from the predominant choice among companies, with the denominator being the number of companies. Consistency considers the number of repeated practices from one period to another, that is, it considers the total number of companies and removes those that changed the choice from period one to period two.

There is a variation in uniformity between periods and the consistency indicator for each accounting choice (Table 4). However, despite the high indicator of consistency and uniformity of some accounting choices, a significant portion of this indicator is based on the absence of information about forest assets over time. This occurs with the choices of: information about measurement, with few companies disclosing details of forest evaluation (despite the increase in disclosure); sensitivity of measurement, in which few companies disclose the fair value variation of assets when evaluation assumptions change; type of asset - without information on the classification of assets as consumable or for production; segregation of assets by maturity, where there is a lack of information on the stage of forests (e.g., mature and immature assets) for most companies; segregation by species, where less than half of the companies present financial information by species; classification of agricultural product on the balance sheet, with more than half of the companies not classifying or not explicitly disclosing this classification.

This consistency scenario, combined with the diversity of choices observed among entities over time and across countries, tends to compromise the comparability of financial information in notes and financial statements, considering that the Conceptual Framework for Financial Reporting provides that consistency precedes comparability ("consistency helps to achieve that objective" [comparability]) (IASB, 2018, item 2.26, p. 18). Additionally, this relationship is confirmed in the literature, as it is found that consistency is positively associated with comparability of financial information (Kim, 2020).

At the beginning of the adoption of IAS 41, theoretical-empirical studies evaluating compliance with the standard indicated that the reduced disclosure compliance of useful information to users would be explained by the incipient level of knowledge in the application of the standard, and that an increase in compliance due to time and learning would lead to relevant disclosures to various user groups (Barros et al., 2012; Talaska & Oliveira, 2016).

Table 4

Comparability and consistency of choices for disclosure and presentation of forest financial reports ¹.

	Type of accounting choice	1st period (2011)		2nd period (2020)			% Consist ³	
		Choice ²	Jnif. ⁴	Changed the choice ^{2...}	kept the choice ^{2...}	Final		Unif. ⁴
Choices on disclosure	Information on the subsequent measurement basis?	Yes (21); no (3)	88%	From 'Not Informed' (NI) to 'Informed' (2)	Yes (21); No (1)	Yes (23), No (1)	96%	92%
		FV (17); Cost (4); NI base (3)	71%	From NI to 'FV' (2); From Cost to FV (2)	FV (17); Cost (2); NI (1)	VJ (21); Cost (2); NI (1)	88%	83%
	Information about the measurement of the asset (fair value)? Which? ⁵	Yes (14); No (3); Cost 4); NI base (3)	58%	From Cost to Yes (2); from NI base to Yes (2)	Yes (14); No (3); Cost (2); NI base (1)	Yes (18); No (3); Cost (2); NI base (1)	75%	83%
		Area (10); NI area (7)	42%	They began to inform the area (5)	Area (10); NI area (2)	Area (15); NI area (6)	63% ⁵	79% ⁶
		Rate (8); NI Rate (9)	33%	They began to inform the rate (8)	Rate (8); NI rate (4)	Rate (16); NI rate (5)	67%	67%
		Price (4); NI price (13)	17%	They began to inform the price (3); they started not informing the price (2)	Price (2); NI Price (13)	Price (5); NI Price (16)	21%	79%
		AVI (4); NI AVI (13)	17%	They began to inform AVI (2); they started not informing AVI (1)	AVI (3); NI AVI (13)	AVI (6); NI AVI (15)	25%	88%
	FV reconciliation at the beginning and end of the period?	Yes (17); No (3); Cost(4)	71%	From 'no' to 'yes' (2); from 'cost' to 'yes' (2)	Yes (17); No (1); Cost (2)	Yes (21); No (1); Cost (2)	88%	83%
	Sensitivity of measurement to changes in unobservable data? Which? ⁵	Yes (2); No (15); cost (4); NI base (3)	8%	From NI base to 'Yes' (2); from Cost to 'yes' (2)	Yes (2); No (15); Cost (2); NI a base (1)	Yes (6); No (15); Cost (2); NI base (1)	25%	83%
		Rate (2); NI Rate (15)	8%	They began to inform the rate (4)	Taxa (2)	Rate (6); NI rate (15)	25%	83%
		Price (1); NI Price (16)	4%	They began to inform the price (3)	Price (1);	Price (4); NI Price (17)	17%	88%
		Margin (1); NI Margin (16)	4%	They began to inform the margin (1)	Margin (1)	Margin (2); NI Margin (19)	8%	96%
	Exchange (1); NI Exchange (16)	4%	-	Exchange (1)	Exchange (1); NI Exchange (20)	4%	100%	
Type of biological asset	Not Informed (24)	0%	Without changes	NI (24)	NI (24)	0%	100%	
Separation of assets by maturity?	Yes (3); No (21)	13%	Without changes	Yes (3); No (21)	Yes (3); No (21)	13%	100%	

	Type of accounting choice	1st period (2011)		2nd period (2020)			% Consist ³	
		Choice ²	Unif. ⁴	Changed the choice ² ...	kept the choice ² ...	Final		Unif. ⁴
	Segregation of assets by type?	Yes (9); No (15)	38%	Without changes	Yes (9); No (15)	Yes (9); No (15)	38%	100%
Presentation choices	Classification of biological assets (Balance Sheet) ⁷	CA e NCA (7); NCA (16); CA (1)	29%	From CA to NCA (1)	CA and NCA (7); NCA (16)	CA and NCA (7); NCA (17)	29%	96%
	Subclassification of biological assets (Balance Sheet) ⁸	- NCA: Subgroup BA (8); LTR (9); PPE (5); Inventories (1).	71%	NCA: from subgroup BA to LTR (1); From PPE to LTR (1)	- NCA: Subgroup BA (7); LTR (9); PPE (4); Inventories (1).	- NCA: Subgroup BA (7); LTR (12); PPE (4); Inventories (1).	79%	88%
		- CC: Inventories (1); Subgroup BA (8)	38%	CA: from subgroup BA to LTR (1)	- CA: Inventories (1); Subgroup BA (7)	- AC: Inventories (1); Subgroup BA (7)	33%	
	Agricultural product classification (Balance Sheet)	Inventories (10); NI (12); Not Classified (2)	42%	From NI to Inventories (1)	Inventories (10); informa (11); classifica (2)	Inventories (11); NI (11); Not Classified (2)	46%	96%
Presentation of the fair value adjustment (P&L) ⁹	SR (2); CGS (5); OI (2); OR (6); CM (4); NI (5)	25%	From CM to NI (2); OI to OR (1); from NI to OR (1); from NI to OI (1)	SR (2); CGS (5); OI (1); OR (6); CM (2); NI (3)	SR (2); CGS (5); OI (2); OR (8); CM (2); NI (5)	33%	79%	

¹ Number of companies in parentheses. ² CA: Current Assets; NCA: Non-Current Assets; BA: Biological Asset; SR: Sales Revenue; OR: Operating Revenue; OI: Other Income; CM: Cost method; Consist: consistency (from one period to another); NI: Not informed; Unif.: Uniformity (between companies in the period) – refers to the number of companies that made the predominant choice in total (eg 21/24 = 88%, 17/21 = 81%). ³ Consistency formula: Total number of companies (e.g., 24) minus companies that 'changed the choice' in the 2nd period, divided by the number of companies (e.g., (24-2)/24 = 92%). ⁴ Uniformity considers the predominant practice recommended by the accounting standard across companies (e.g., fair value) divided by the total of possible practices (e.g., 17/24 = 71%). ⁵ Uniformity across the four choices in this topic is measured by the # of recommended core practice companies (in the 'final' column) divided by the total number of companies (e.g., (15/24) = 63%). ⁶ Consistency is measured by the number of companies (24) minus companies that 'changed choice' divided by the total number of companies (e.g., (24-5)/24 = 79%). ⁷ The recommended practice in this case is to recognize forests in Current Assets (those that will be harvested in the following fiscal year) and in Non-Current Assets (harvested after the subsequent fiscal year). ⁸ It considered as a practice recommended by the accounting standard the classification in Current Assets: Subgroup Biological Assets, Long-Term Assets and in Current Assets: Inventories and Subgroup Biological Assets. A company classifies forests only as Inventories in current assets in period 1. ⁹ It was considered best practice to recognize the adjustment as Other Revenues, according to the literature reviewed in section 2.

Source: Research data.

However, the results of this research are consistent with the literature regarding the absence of a learning curve and the finding that there is no significant improvement in the disclosure of mandatory information over the years (Tortoli et al., 2018). The motivations for lack of disclosure and presentation of assets seem to be rooted in the lack of interest in disclosing essential information about the activity that could compromise the business strategy (Machado et al., 2014), as predicted in Agency Theory, where managers would only disclose information that does not affect their interests (L. Y. (Colly) He et al., 2021).

In approximately ten years of application of IAS 41 in the analyzed countries, it is observed that audit and market monitoring have not been sufficient to prevent lack of uniformity in the application of the standard (Ganassin et al., 2016) regarding the recognition and measurement of biological assets, probably because the principles are sufficiently broad that the adoption of different practices is compliant with the standard. There is also evidence of incomplete compliance with the international standard in terms of information disclosure (Monico et al., 2020; Talaska & Oliveira, 2016), probably because there is greater tolerance or lower enforcement regarding the non-disclosure of information in the notes.

There are signs that, in addition to the level of enforcement, the legal system and audit are some of the variables that could contribute to explaining this scenario. Based on the defenders of this approach, countries with lower levels of enforcement, adopters of civil law, and with non-big four auditors (as in some companies in the sample) would have accounting information with lower reliability and relevance (Liao et al., 2020; Xie et al., 2020). The question persists: "is non-disclosure worth it in environments like this, given the reduced penalty?" National-level enforcement mechanisms should be created to increase compliance with the standard, in order to provide greater comparability of information between companies and over time.

The level of technical knowledge for the application of the international standard to very specific assets (D. de L. Oliveira et al., 2020) and the profile of financial statement preparers (Cavalheiro, Gimenes, & Binotto, 2019) are also presented in the literature as potential variables that tend to explain distinct practices among companies in the accounting treatment of biological assets.

5 CONCLUSIONS

The research aimed to identify the main accounting choices of disclosure and presentation in financial reports and analyze comparability in terms of these choices. For this purpose, entities that have forest assets in three Latin American countries were selected and two post-adoption periods of IAS 41 (2011 and 2020) were examined. Each set of financial statements had its data collected and analyzed based on the content analysis methodology. This allowed identifying the accounting choices made in each category without the need for quantitative examinations with the estimation of proxies for comparability.

The research started from the premise of identifying high comparability of accounting choices, based on the analysis of a single type of asset in the examined entities. However, the uniformity found in the choices refers to the

absence of information disclosure, which means loss of comparability and refutes the initial premise. In addition, it was observed that there is a diversity of accounting choices and, in those that were disclosed, a lack of necessary information for comparability and understanding of the accounting choices made by managers.

Considering that financial statements are audited (which denotes compliance with the accounting standard at first), the diversity of accounting disclosure choices between periods and between companies means a range of possibilities for choices by the manager and freedom for the preparer to exercise judgment. Besides meaning less uniformity than expected, it is difficult to assume that the use of all these choices reflects fidelity of representation.

These findings contribute to the literature on information quality by advancing the examination of comparability among peers. It was observed that the consistency metric over time needs to separate what represents an improvement in practice. It was also found that a principle-based standard may allow for differences among peers, but it may also allow for inconsistencies to appear and lead users of accounting information to comparability errors and impair decision-making.

There is also a contribution to the specific literature on biological assets, by analyzing the gap in comparability of biological asset disclosures. The volume of missing information and the diversity of terms used to express the same event suggest little concern by the preparer of accounting information with the practices and terminologies used in the segment, which can undermine the relevance of accounting information. These findings demonstrate the need to expand the literature on biological assets and comparability of accounting choices. It makes it evident that there is a need for greater scientific discussion of applicable standards for biological assets, given that the generality allowed by the standards (e.g., IAS 41) allows for diversity of interpretation and accounting choices that impair comparability.

Regarding external users of accounting information, this research highlights the difficulties they face when analyzing and selecting investments in the agroforestry segment. The diversity of choices, terms, and absence of relevant information for the decision-making process demonstrates the need for greater attention, mastery of terminology, and knowledge of the choices available to managers in the financial statement analysis phase of companies in the segment. For regulatory and accounting standard-setting bodies, there is a need to discuss the improvement of standards and regulations to increase comparability, suggesting to preparers examples of terms and choices in an attempt to homogenize the diversity of options, allowing peers to be analyzed as consistent and different ones as different. Such discussions can elicit consensus among the parties involved and ensure greater reliability and relevance of accounting information in this segment.

Possible causes of the findings in this research may be subject to empirical verification in future studies, as they were not the object of this one. Regarding the variety of choices, some causes can be further investigated, such as the lack of enforcement of accounting standards and other governance mechanisms, as well as cultural differences between countries. Future research could investigate

whether the disclosure of relevant information with lower transparency aims to cover up choices with a bias towards earnings management. Regarding consistency, it is possible that there is a learning curve effect, with improvement from a growing understanding of users' needs or the influence of peer practice. In addition, it is suggested that future studies investigate the factors that explain the disclosure and presentation choices of financial reports in specific segments, comparing them with the agroforestry segment. Furthermore, motivators for each accounting choice, its adequacy to the standard, and the perception of the impact of the choice could be investigated from the perspective of preparers of financial statements (management, accountants, controllers) in specific segments.

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Appendices - Additional analyzes

Appendix A

Results by sample: fair value measurement inputs.

<i>Part I - Complete sample</i>				
Measurement assumptions	Period 1		Period 2	
	Companies	%	Companies	%
Discount rate	9	52,94%	16	76,19%
Planted area (ha)	10	58,82%	16	76,19%
Wood price (\$/m3)	4	23,53%	8	38,10%
Environmental Asset Index	4	23,53%	5	23,81%
Remun. assets/land	1	5,88%	2	9,52%
<i>Part II - Sample forestry segment</i>				
Measurement assumptions	Companies	%	Companies	%
Discount rate	6	35,29%	10	47,62%
Planted area (ha)	6	35,29%	10	47,62%
Wood price (\$/m3)	3	17,65%	5	23,81%
Environmental Asset Index	3	17,65%	3	14,29%
Remun. assets/land	0	0,00%	0	0,00%
<i>Part III - Sample of other segments with forests</i>				
Measurement assumptions	Companies	%	Companies	%
Discount rate	3	17,65%	6	28,57%
Planted area (ha)	4	23,53%	6	28,57%
Wood price (\$/m3)	1	5,88%	3	14,29%
Environmental Asset Index	1	5,88%	2	9,52%
Remun. assets/land	1	5,88%	2	9,52%

Source: Survey data.

Appendix B

Sample Results: Fair Value Reconciliation.

<i>Part I - Complete sample</i>				
Do they reconcile fair value?	Companies	%	Companies	%
Yes	16	94,12%	20	95,24%
No	8	47,06%	4	19,05%
<i>Part II - Sample forestry segment</i>				
Do they reconcile fair value?	Companies	%	Companies	%
Yes	12	70,59%	13	61,90%
No	3	17,65%	2	9,52%
<i>Part III - Sample of other segments with forests</i>				
Do they reconcile fair value?	Companies	%	Companies	%
Yes	4	23,53%	7	33,33%
No	5	29,41%	2	9,52%

Source: Survey data.

Appendix C

Sample Results: Fair Value Sensitivity.

<i>Part I - Complete sample</i>				
Fair value sensitivity	Period 1		Period 2	
	Companies	%	Companies	%
Discount rate (% p.a.)	2	11,76%	6	28,57%
Wood price (\$/m3)	1	5,88%	4	19,05%
Margin (% profit/price)	1	5,88%	2	9,52%
Exchange (e.g. R\$/US\$)	1	5,88%	1	4,76%
<i>Part II - Sample forestry segment</i>				
Fair value sensitivity	Companies	%	Companies	%
Discount rate (% p.a.)	2	11,76%	5	23,81%
Wood price (\$/m3)	1	5,88%	3	14,29%
Margin (% profit/price)	1	5,88%	2	9,52%
Exchange (e.g. R\$/US\$)	1	5,88%	1	4,76%
<i>Part III - Sample of other segments with forests</i>				
Fair value sensitivity	Companies	%	Companies	%
Discount rate (% p.a.)	0	0,00%	1	4,76%
Wood price (\$/m3)	0	0,00%	1	4,76%
Margin (% profit/price)	0	0,00%	0	0,00%
Exchange (e.g. R\$/US\$)	0	0,00%	0	0,00%

Source: Survey data.

Appendix D

Sample results: agricultural product classification.

<i>Part I - Complete sample</i>				
Agricultural product classification	Period 1		Period 2	
	Companies	%	Companies	%
Stocks	9	37,50%	10	41,67%
Stocks (logs and wood)	1	4,17%	1	4,17%
Not informed	12	50,00%	11	45,83%
Not classified	2	8,33%	2	8,33%
<i>Part II - Sample forestry segment</i>				
Agricultural product classification	Companies	%	Companies	%
Stocks	7	29,17%	8	33,33%
Stocks (logs and wood)	1	4,17%	1	4,17%
Not informed	5	20,83%	4	16,67%
Not classified	2	8,33%	2	8,33%
<i>Part III - Sample of other segments with forests</i>				
Agricultural product classification	Companies	%	Companies	%
Stocks	2	8,33%	2	8,33%
Stocks (logs and wood)	0	0,00%	0	0,00%
Not informed	7	29,17%	7	29,17%
Not classified	0	0,00%	0	0,00%

Source: Survey data.

Appendix E

Results by sample: classification and subclassification of forests.

<i>Part I - Complete sample</i>					
Classification	Period 1	Period 2	Subclassification	Period 1	Period 2
Current Asset (only)	1	0	<i>Current Asset</i>	8	7
Non-Current Asset	16	17	Inventory	1	1
Current and Non-Current Asset	7	7	Subgroup 'biológico assets'	7	6
			<i>Non-Current Asset</i>	23	24
			Inventory	1	1
			Subgroup 'biological assets'	8	7
			Long term realizable Property, Plant and Equipment	9	12
				5	4
<i>Part II - Sample forestry segment</i>					
Classification	Period 1	Period 2	Subclassification	Period 1	Period 2
Current Asset (only)	0	0	<i>Current Asset</i>	7	7
Non-Current Asset	8	8	Inventory	1	1
Current and Non-Current Asset	7	7	Subgroup 'biological assets'	6	6
			<i>Non-Current Asset</i>	15	15
			Inventory	1	1
			Subgroup 'biological assets'	8	7
			Long term realizable Property, Plant and Equipment	4	5
				2	2
<i>Part III - Sample of other segments with forests</i>					
Classification	Period 1	Period 2	Subclassification	Period 1	Period 2
Current Asset (only)	1	0	<i>Current Asset</i>	1	0
Non-Current Asset	8	9	Inventory	0	0
Current and Non-Current Asset	0	0	Subgroup 'biológico assets'	1	0
			<i>Non-Current Asset</i>	8	9
			Inventory	0	0
			Subgroup 'biological assets'	0	0
			Long term realizable Property, Plant and Equipment	5	7
				3	2

Source: Survey data.

Appendix F

Results by sample: classification of fair value adjustment (DRE).

<i>Part I - Complete sample</i>				
Gains and losses in the P&L	Period 1		Period 2	
	Companies	%	Companies	%
Sales revenue	2	8,33%	2	8,33%
Cost of goods sold	5	20,83%	5	20,83%
Operating income/expenses	2	8,33%	2	8,33%
Other operating income	6	25,00%	8	33,33%
Measurement at cost	4	16,67%	2	8,33%
Not informed	5	20,83%	5	20,83%
<i>Part II - Sample forestry segment</i>				
Gains and losses in the P&L	Companies	%	Companies	%
Sales revenue	1	4,17%	1	4,17%
Cost of goods sold	4	16,67%	4	16,67%
Operating income/expenses	2	8,33%	2	8,33%
Other operating income	5	20,83%	6	25,00%
Measurement at cost	2	8,33%	1	4,17%
Not informed	1	4,17%	1	4,17%
<i>Part III - Sample of other segments with forests</i>				
Gains and losses in the P&L	Companies	%	Companies	%
Sales revenue	1	4,17%	1	4,17%
Cost of goods sold	1	4,17%	1	4,17%
Operating income/expenses	0	0,00%	0	0,00%
Other operating income	1	4,17%	2	8,33%
Measurement at cost	2	8,33%	1	4,17%
Not informed	4	16,67%	4	16,67%

Source: Survey data.