**Aalto University
School of Business**

Fair value adoption in Central and Eastern Europe - Do firms apply fair value accounting to tangible non-current assets under IFRS?

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Abstract

This study focuses on two asset groups under non-current non-financial assets: property, plant, and equipment (PPE) and investment property. The object of the research is to find out whether the dominant role of historical cost accounting evidenced by prior studies applies to companies domiciled in Central and Eastern Europe. What is more, I also examine how fair value accounting affects asset values and explore what explains the choice to use fair value. All the companies included in the research report under the International Financial Reporting Standards (IFRS). The total sample comprehends companies that come from five different countries including Estonia, Latvia, Lithuania, Poland and Slovenia.

  To clarify the applied accounting methods for PPE and investment property I read each company's accounting policies for these asset groups in its annual report. Fair value accounting's effect on asset values is studied by comparing different financial ratios between historical cost companies and fair value companies. The choice to apply fair value accounting to PPE and investment property is examined by applying a logistic regression analysis.

  In line with previous evidence, historical cost accounting is the dominant accounting method. However, I find more support for fair value accounting for PPE than previous studies. On the other hand, fair value accounting for investment property is slightly less popular than results from earlier studies would suggest. The results indicate that fair value accounting has a significant impact on asset values. Fair value companies have clearly higher book-to-market ratios and lower return on assets (ROA). When examining the choice to apply fair value, I find that companies operating in the real estate industry are more likely to apply fair value to investment property. As for PPE, there are two factors that explain the choice to apply fair value. First, companies that measure investment property at fair value are more likely to apply fair value to PPE as well. Second, PPE-heavy firms are more likely to measure PPE at fair value.

Keywords Fair value, IFRS, PPE, investment property, CEE-countries

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Tiivistelmä

Tässä tutkimuksessa keskitytään kahteen pysyviin vastaaviin kuuluvaan omaisuusryhmään; aineelliset pysyvät vastaavat (PPE) ja sijoituskiinteistöt. Tutkielman tavoitteena on selvittää, miten arvostusperiaatteen valinta jakautuu IFRS-standardien mukaan raportoivien yhtiöiden välillä viidessä eri Itä-Euroopan maassa. Tutkimuksessa myös selvitetään, miten käyvän arvon käyttö laskentaperiaatteena vaikuttaa yhtiöiden varojen tasearvoihin ja pyritään löytämään käyvän arvon käyttöä selittäviä syitä. Tutkimukseen sisältyvät seuraavat maat: Viro, Latvia, Liettua, Puola ja Slovenia.

Selvitän yhtiöiden käyttämät laskentaperiaatteet PPE:n ja sijoituskiinteistöjen arvostamisessa lukemalla yhtiöiden vuosikertomuksista laskentaperiaatteet näiden kahden omaisuusryhmän osalta. Käyvän arvon käytön vaikutusta yhtiöiden varojen tasearvoihin tutkitaan vertaamalla taloudellisia tunnuslukuja eri laskentaperiaatteita käyttävien yhtiöiden välillä. Valintaa käyttää käypää arvoa arvostusperiaatteena pyritään selittämään logistisen regressioanalyysin avulla.

Aikaisempien tutkimustulosten mukaisesti hankintameno on selvästi yleisemmin käytetty arvostusmenetelmä kuin käypä arvo. Käypää arvoa käytetään kuitenkin selvästi enemmän aineellisten pysyvien vastaavien arvostusmenetelmänä kuin aikaisempien tutkimustulosten valossa voisi odottaa. Toisaalta sijoituskiinteistöjen arvostuksessa hankintamenoa käytetään odotettua enemmän. Käyvän arvon käyttö vaikuttaa selvästi yhtiöiden varojen kirjanpitoarvoihin. Käypää arvoa käyttävillä yhtiöillä varojen ja oman pääoman tasearvot ovat selvästi lähempänä niiden markkina-arvoja ja sijoitetun pääoman tuotto (ROA) on alempi. Sijoituskiinteistöjen kohdalla käyvän arvon käyttöä selittää parhaiten yhtiön toimiminen kiinteistösijoitusalalla. Vastaavasti käyvän arvon käyttöä PPE:n kohdalla selittää kaksi asiaa. Yhtiöt, jotka arvostavat sijoituskiinteistönsä käypään arvoon, käyttävät käypää arvoa muita todennäköisemmin myös PPE:n arvostamisessa. Lisäksi yhtiöt, joiden taseesta suuri osa koostuu PPE-hyödykeryhmästä, käyttävät usein käypää arvoa tämän tase-erän arvostamisessa.

Avainsanat Käypä arvo, IFRS, PPE, sijoituskiinteistöt, Itä-Euroopan maat

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1. Introduction

1.1 Background and motivation

The choice between fair value and historical cost accounting has been a widely discussed issue for a long time. The debate was going on already in 1930s (Fabricant, 1936) and it is still current with the increasing popularity of the International Financial Reporting Standards (IFRS). Companies reporting under IFRS can apply fair value accounting to a wide set of assets whereas many national accounting standards (e.g. US GAAP) impose much stricter limitations on the use of fair value accounting.

There are various opinions about the appropriate use of fair value accounting. It has been argued that it produces more relevant information and improves transparency (Schipper, 2005). On the other hand, the reliability of fair value estimates has been subject to criticism by practitioners (Ernst&Young, 2005) and also by academics (e.g. Watts, 2006). Watts (2006) claimed that management can easily adjust fair value estimates to reach the desired outcome.

The most recent international study focusing on the choice between historical cost and fair value accounting for non-financial assets is conducted by Christensen and Nikolaev (2013). The study was first published as a working paper in 2008 and 2009 under two different names. The final version of the study was published in Review of Accounting Studies in 2013. That research is based on data from British and German companies reporting under IFRS right after the mandatory IFRS adaption in 2005 and 2006.

Christensen and Nikolaev found that historical cost was the dominating accounting method for intangible assets and property, plant, and equipment (PPE). Intangible assets were valued at historical cost without exception and only 3 per cent of the companies applied fair value accounting to at least one asset group under PPE. However, fair value accounting was applied to approximately 50% of investment properties. Withstanding Christensen and Nikolaev's findings Muller et al. (2008) found that most companies in

the European real estate sector applied fair value to investment property after the IFRS adoption.

Christensen and Nikolaev compared the book values of assets and equity to their market values in their study. They concluded that companies applying fair value to either PPE or investment property had significantly higher book-to-market value ratios. What is more, when they studied the choice of an accounting method they found that fair value accounting has an association with debt finance.

This study focuses on the choice of valuation methods under IFRS in Central and Eastern Europe (CEE). There are no previous international studies focusing on valuation practices of tangible non-current assets in CEE countries under IFRS. Intangible non-current assets are ruled out since they are very much always measured at cost. IFRS imposes strict requirements for valuing intangibles at fair value, which explains the dominance of the cost method in practice.

Entities included in this study are domiciled in the following countries: Estonia, Latvia, Lithuania, Poland and Slovenia. These countries were chosen due to their institutional similarities: they all joined the European Union (EU) in 2004 and they have same type of accounting rules for PPE and investment property. Investment property can be measured at fair value according to the local accounting rules in each country. As for PPE, fair value accounting is allowed in all countries apart from Estonia. Given the local accounting regulations I expect that companies reporting under IFRS are more likely to apply fair value to at least one asset class under PPE than British and German companies in Christensen and Nikolaev's study.

According to previous studies the choice of an accounting method for investment property is more industry-related than country-specific. Therefore, I do not have a prediction whether the firms in this study are more or less likely to apply fair value accounting to investment property than British and German firms. Finally, the dominant position of Polish firms in this study may entail unexpected results since Polish firms represent approximately two thirds of the sample. Polish GAAP accepts upward revaluations for tangible non-current assets but it does not explicitly introduce a

revaluation or fair value model as an accounting method. Therefore, it is possible that Polish firms rely exclusively on historical cost accounting for PPE and investment property. This would prove the before-mentioned prediction of the regularity of fair value accounting for PPE to be completely wrong.

1.2 Research questions and research method

There are three main research questions in this study. First, I find out how widely used accounting method fair value accounting is for PPE and investment property. In this context I also examine how different accounting methods are applied across different industries. Second, I analyse how fair value accounting affects the book value of assets. Evidence from previous studies suggests that fair value accounting should be associated with substantial differences in companies' balance sheets. Last, I find out what explains the choice to use fair value accounting for PPE and investment property.

I find out how widely companies apply fair value accounting by simply reading accounting policies in their annual reports. Fair value accounting's effect on asset values is examined by comparing different financial ratios between fair value companies and historical cost companies. To explain the choice to use fair value accounting a logistic regression analysis is applied. I test whether different company characteristics, as leverage, affect the choice to use fair value. I form two subsamples to conduct the analysis. One sample includes all companies applying fair value accounting to at least one asset class under PPE and the other sample includes those companies that hold investment property. More detailed descriptions about the research methods are presented in chapters four and five, which are the empirical parts of this study.

The research data are derived from Thomson One Banker and Worldscope databases. Companies included in the study must prepare their financial reports under IFRS and they must be domiciled in the CEE countries under consideration. The data are from the year 2010 for a few reasons. First, data from that year have a good accessibility. Second, the 2010 data are still quite close to present and therefore reflect the current accounting practices as well. Last, by 2010 companies had already reported a few years under IFRS

and therefore their accounting policies should have been stabilized by that time. All the data were derived from the databases in December 2013.

The annual reports are derived from companies' official web pages in the first place. As for the Baltic companies, the Baltic stock exchange offers a good database that includes listed companies' annual reports. To identify the asset valuation practices a company follows, I read the accounting policy section of its 2010 annual report. If the 2010 annual report is not available, I will read the 2011 annual report. It is possible to verify the accounting practices also from the 2011 annual report since annual reports must include comments on changes in accounting policies. Therefore, if a company makes a switch between historical cost and fair value, the annual report must include information regarding that switch. This study includes only companies whose annual reports are available in English.

1.3 Research structure

The theoretical background of this study is described in the second chapter. That chapter introduces the most important international accounting standards (IAS) and IFRSs in the context of this research. I start with describing the standards for PPE and investment property. After summarising these two standards, I will go through the standard that defines the fair value concept under IFRS. Last, I introduce the local accounting standards in the countries under research. It is crucial to draw a picture of companies' institutional backgrounds to understand the choice of an accounting method under IFRS.

The third chapter describes previous research on both fair value accounting concept and fair value accounting for non-financial assets as well. There are multiple studies that highlight the excellence of fair value accounting and promote its use for non-financial assets as well. However, there are also many studies challenging the fair value concept and supporting the use of historical cost accounting. The most common and convincing arguments for and against fair value accounting are presented in this chapter. Finally,

the third chapter also summarises previous studies on how fair value accounting affects asset values and what explains the use of fair value accounting.

Chapters number four and five are the empirical parts of this study. In chapter four there is a statistical description exploring how widely used concept fair value accounting is in general and across different industries and asset classes as well. In this chapter, I also examine how fair value accounting affects asset values.

In chapter five the focus is on the choice of an applied accounting method. Here, I explore what explains the choice to use fair value accounting for PPE and investment property. To explain this interesting choice I apply a logistic regression model. I also examine the possible correlations between independent variables and the choice to use fair value.

Chapter six is the last part of the study. In this last chapter I summarise the main findings and represent my conclusions. At the end, possible topics for further research are considered.

2. Accounting for PPE and investment property under IFRS and local accounting rules

2.1 Accounting for PPE and investment property under IFRS

Since January 1, 2005, all listed companies have been obligated to prepare their consolidated financial statements in compliance with IFRS in the EU. While this has improved comparability between companies (Cairns et al., 2011), IFRS also offers companies with a wider set of valuation opportunities than many local accounting standards (e.g. US GAAP & German GAAP). In this part of the study I summarise the essential accounting rules for PPE and investment property under IFRS. The complete standards can be found at the IFRS home page www.ifrs.org.

The applicable accounting rules for PPE are represented in IAS 16 and the accounting practices for investment property are described under IAS 40, respectively. The standards include detailed descriptions of the accepted accounting practices from initial recognition to disposal of assets. There are also other IFRSs that have made consequential amendments to IAS 16 and IAS 40. In respect of this study, the most influential standard having made amendments to these two standards is IFRS 13, "Fair value measurement". IFRS 13 defines fair value and replaces the requirements that are described in individual standards.

According to IAS 16, after recognition as an asset, an item of PPE can be carried either at its historical cost or at a revalued amount less accumulated depreciation and impairment losses. Under IAS 40, after initial recognition, a company can choose between the historical cost and the fair value model as for accounting for investment property. Intangible non-financial assets can also be carried either at historical cost or at a revalued amount less amortization and impairment charges according to IAS 38. However, intangible assets are ruled out of this study since companies measure them at cost almost without exception (e.g. Christensen & Nikolaev, 2013). Next, I will summarize the accounting standards for PPE (IAS 16) and investment property (IAS 40) as well as the standard defining fair value, IFRS 13.

2.1.1 IAS 16: Property, plant and equipment

The International Accounting Standards Board (IASB) issued the current version of IAS 16 in December 2003 and it has been in effect since January 1, 2005. IAS 16 defines property, plant and equipment as tangible assets that (IAS 16.6):

a) "are held for use in the production or supply of goods and services, for rental to others, or for administrative purposes; and

b) are expected to be used during more than one period."

IAS 16 includes also other essential definitions related to the valuation of PPE in sections 16.6 and 16.7. *Cost* is "the amount of cash or cash equivalents paid or the fair

value of the other consideration given to acquire an asset at the time of its acquisition or construction". The cost of an item of PPE is recognized as an asset if it is probable that the entity will receive future gains that are related to the item. In addition, it must be possible to determine the cost of the item accurately. (IAS 16.7.)

Carrying amount is the recognised amount after accumulated depreciation and impairment losses are deducted (IAS 16.7). *Fair value* is defined as the price that the entity would receive if it sold the asset in a normal transaction (IAS 16.6). Fair value can also equal the price paid when a liability changes hands between market participants at the measurement day (IAS 16.7). A more detailed description of fair value measurement is described in section 2.1.5 where IFRS 13, "Fair value measurement", is summarised.

2.1.2 Valuation of PPE according to IAS 16

At the initial recognition, an item of PPE is measured at cost (IAS 16.15). The cost of an item equals its purchase price. Import duties and non-refundable purchase taxes are included in the purchase price. In addition, the purchase price comprehends all the necessary costs that are directly related to bringing the asset to the location and condition to operate. An estimate of the costs of disassembly and removal of the item is also included in the cost. Last, a projection of the cost of restoring the site where the item is located is a part of the purchase price. (IAS 16.16.) After the initial recognition, an entity must choose between the cost model and the revaluation model as its accounting policy and apply that model to all assets in the same asset class under PPE (IAS 16.29).

Cost model

After recognition, according to the cost model an asset is carried at its cost less accumulated depreciation and impairment (IAS 16.30).

Revaluation model

If the revaluation method is applied, an item of PPE is carried at a revalued amount. The revalued amount equals the asset's "fair value at the revaluation date less any subsequent accumulated depreciation and subsequent accumulated impairment losses" (IAS 16.31). It is emphasized in section 16.31 that only assets whose fair value can be determined reliably can be measured at fair value. Different items of PPE demand different frequencies for revaluations. It is explicitly stated in IAS 16.34 that the frequency of revaluations depends on the type of the asset. In practice, entities have to revalue certain assets annually whereas other assets may be revalued every two to four years, for instance.

If a PPE item is revalued, the entire class of assets where that item belongs must be revalued (IAS 16.36). For instance, if an entity measures one land area at fair value, it must revalue all its land areas that belong to the same asset class. A class of PPE is a group of assets that have a similar nature and the entity uses them for same purposes (IAS 16.37). The items within a class of PPE must be revalued either at the same time or at least within a short period of time (IAS 16.38).

If a revaluation of an asset results in an increase in the asset value, the increase is recognized in other comprehensive income and credited in equity under the revaluation surplus. However, the increase is recognized in profit or loss to the amount it reverses a revaluation decrease of the same asset(s) previously recognized in profit or loss. (IAS 16.39.) A revaluation of an asset can also result in a decrease in the asset value. In this case, the decrease is recognized in profit or loss. Nevertheless, the decrease must be recognized in other comprehensive income to the extent it reverses a previous revaluation increase related to that asset(s). The decrease in other comprehensive income reduces the amount of revaluation surplus accumulated under equity. (IAS 16.40.)

The revaluation surplus under equity that is related to an item of PPE may be transferred to retained earnings when the asset is derecognized. However, an entity can transfer a part of the surplus to retained earnings even though the asset is still used by

the entity. In this case, the amount of the transferred surplus equals the difference between the actual depreciation and depreciation based on the original cost of the asset. These transfers from revaluation surplus to retained earnings always bypass the profit or loss statement. (IAS 16.41.) Accounting practices for possible tax effects on income that result from the revaluation of PPE are described in IAS 12, "Income taxes" (IAS 16.42).

2.1.3 IAS 40: Investment property

The current version of IAS 40 has been in effect since January 1, 2005. It defines investment property as a property that is "held to earn rentals or for capital appreciation or both". An investment property can create cash flows separately, which differentiates it from owner-occupied properties under PPE (IAS 40.7.) Accounting for owner-occupied property follows the rules that are described in IAS 16 (see sections 2.1.1 and 2.1.2).

Investment property is recognized as an asset only when it is probable that the entity will receive the future gains associated with the property. Also, the cost of the investment property must be measurable (IAS 40.16.) According to IAS 40.10 a property can be classified partly as an investment property and partly as an owner-occupied property. This is possible if the entity sell these two parts separately. If not, the property can be classified as an investment property only if a minor part of it is being used for production or administration.

2.1.4 Valuation of investment property according to IAS 40

At recognition, investment property is measured at cost. Transaction costs are included in the initial measurement. (IAS 40.20.) After the initial recognition an entity must choose as its accounting policy either the fair value model or the cost model (IAS 40.30).

Cost model

After the initial recognition, an entity that chooses the cost model must measure all of its investment property in accordance with IAS 16 accounting rules (IAS 40.56). IAS 16 is described in sections 2.1.1 and 2.1.2.

Fair value model

If an entity chooses to apply the fair value model to its investment property after the initial recognition, it must apply fair value to all of its investment property apart from few special circumstances that are mentioned later in this section (IAS 40.33). When the fair value model is applied, a change in the fair value of investment property is recognized in profit or loss and investment property is not depreciated (IAS 40.35). Recognizing changes in fair value in profit or loss and not accounting for depreciation distinguish fair value model for investment property from the PPE revaluation model where changes in fair value are recognized in other comprehensive income and items of PPE are depreciated. In practice, changes in fair value of investment property are recognized in other income or other expenses, respectively.

IAS 40 requires all entities to measure the fair value of investment property. The reason for measuring the fair value can be either measurement (if the fair value model is applied) or disclosure (if the cost model is used). The standard also recommends entities to measure the fair value of investment property by an independent valuer who holds professional qualification and experience. (IAS 40.32.) In general, IAS 40 promotes fair value accounting by representing the fair value method as the first method for accounting for investment property.

The standard also states that if an entity makes a voluntary change in its accounting policies, it is very much unlikely that a change from the fair value method to the cost method would improve relevance in the financial statements (IAS 40.31). In other words, a change from the fair value model to the cost model cannot be justified apart from some very special circumstances. Moreover, if an entity has previously measured investment property at fair value, it must continue that accounting policy until disposal

even if it becomes harder to determine the fair value of the investment property (IAS 40.55). In practice, measuring the fair value reliably can be extremely challenging if market activity declines.

The standard assumes that an entity can reliably measure the fair value of investment property on a continuing basis. However, if the fair value of an investment property is not reliably measurable on a continuing basis, the entity must measure that investment property according to the cost model in IAS 16. In this case, the entity must apply IAS 16 until the disposal of the investment property and the residual value of the property is expected to be zero. The fair value of investment property is not measurable only when an active market does not exist and other reliable ways to determine the fair value are not available. (IAS 40.53.) As highlighted in the standard, these circumstances are exceptional.

2.1.5 IFRS 13: Fair value measurement

IFRS 13, "Fair value measurement", defines fair value and sets specific rules for measuring fair value. The standard has been in effect since January 1, 2013. IFRS 13 determines the fair value concept, establishes a framework for measuring fair value and sets rules for disclosure information about fair value measurements (IFRS 13.1). This standard is applied (apart from few exceptions) when another IFRS or IAS demands or permits fair value measurements or related disclosures (IFRS 13.5).

Fair value is defined as "the price that would be received when selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (IFRS 13.9). In the context of this study, the focus is solely on the valuation of non-financial assets since both PPE and investment property fall into that asset category.

As stated in section 13.11, fair value is always measured for a specific asset. It is emphasized in this section that an entity must consider the relevant characteristics of an

asset at the measurement date. The two following characteristics are mentioned in section 13.11:

a) "the condition and location of the asset; and

b) restrictions ... on the sale or use of the asset."

Furthermore, the fair value measurement expects that the asset is sold either (IFRS 13.16):

a) "in the principal market ...; or

b) in the absence of a principal market, in the most advantageous market for the asset..."

Market participants are expected to "act in their *economic best interest* "(IFRS 13.22) and *price* is the amount to be received if an asset is sold in a normal transaction at the time of measurement in current market environment (IFRS 13.24).

In respect of this study, the most essential part of the standard is the section that sets the fair value measurement principles for non-financial assets. It is assumed that assets are in their *highest and best use*. Therefore, a fair value measurement of non-financial assets takes into consideration a market participant's capability to create value by using the asset (IFRS 13.27). The highest and best use of an asset is evaluated by considering three dimensions from market participants' perspective (IFRS 13.28):

a) A *physically possible* use considers relevant physical characteristics of the asset (e.g. durability of a vehicle).

b) A *legally permissible* use takes into account legal regulations imposed on the use of the asset (e.g. environmental regulation applicable to a factory).

c) A *financially feasible* use considers whether the use of the asset that is already physically possible and legally permissible can generate required income or cash flows.

It is emphasized in section 13.31 that an asset may be in its highest and best use either alone, in combination with other assets or with other assets and liabilities. Therefore, the highest and best use for an asset is very much related to the particular asset under consideration.

When defining the fair value of an asset, an entity must use valuation techniques that fit in the given environment and for which right kinds of data are available (IFRS 13.61). According to the standard, entities should "*maximise the use of relevant observable inputs and minimise the use of unobservable inputs*" (IFRS 13.67). To provide a basis for fair value measurements, IFRS 13 introduces *a fair value hierarchy* where inputs to different valuation techniques are classified in three levels:

- "Level 1 inputs are quoted prices in active markets." These quoted prices can be used if there is an active and accessible market for similar assets at the time of measurement. (IFRS 13.76.)

- "Level 2 inputs are inputs other than quoted prices included within level 1." These inputs must be observable for the asset. (IFRS 13.81.)

- "Level 3 inputs are unobservable inputs for the asset." (IFRS 13.86)

According to the fair value hierarchy level 1 inputs have the highest priority whereas level 3 inputs have the lowest priority (IFRS 13.72). In practice, it might be challenging to find quoted prices in active markets for non-financial assets, for instance items of PPE. Therefore, entities must also apply level 2 and 3 inputs to valuation models when measuring fair values. Level 2 inputs can be quoted prices in active markets (IFRS 13.82). However, level 2 inputs can also be quoted prices in inactive markets as well as other inputs than quoted prices, for example commonly quoted interest rates (IFRS 13.82).

Level 3 inputs are not observable and these inputs should be used to measure fair value only if it is not possible to use level 1 or 2 inputs (IFRS 13.87). When an entity must use unobservable inputs, these inputs should reflect market participants' assumptions when determining the price for a same kind of asset (IFRS 13.87). These assumptions might include an adjustment for risk, for instance (IFRS 13.88).

IFRS 13 provides guidance on using level 2 and 3 inputs for particular assets. The standard also includes detailed disclosure requirements for assets that are measured at fair value as well as for valuation techniques and inputs. However, these parts of the standard are not within the scope of this study and therefore they are not described here.

2.2 Local accounting rules for PPE and investment property

This part of the study summarises the local regulation for accounting in the countries under research. There is a short description of accounting policies in each country. These descriptions focus on the accounting rules for PPE and investment property for the most part.

2.2.1 Baltic countries (Estonia, Latvia & Lithuania)

Estonia

In Estonia, the Estonian Accounting Standards Board (EASB) is responsible for issuing and amending the Estonian accounting standards (Estonian GAAP) (www.easb.ee). The current version of Estonian GAAP is broadly based on IFRS for small and medium-sized entities (IFRS for SMEs) and it has been in effect since January 1, 2012 (PWC, 2013). Accordingly, the local standards are very much similar with IFRS for SMEs apart from some rather minor differences (PWC, 2013). In practice, most small and medium size entities follow Estonian GAAP since the disclosure requirements are far less demanding than in the full IFRS. However, applying the full IFRS is permitted for all companies since

the EASB believes that it improves the overall quality of financial reporting in Estonia (www.easb.ee.)

Estonian accounting standards are called ASBGs. Accepted accounting policies for PPE are described in ASBG 5 "Property, Plant and Equipment and Intangible Assets". At the initial recognition, items of PPE are measured at cost (ASBG 5.13). Subsequently, the only accepted valuation practice for assets under PPE is the historical cost method (ASBG 5.23). Under the historical cost method items of PPE are measured at cost less any accumulated depreciation and impairment losses (ASBG 5.23). In this respect, Estonian GAAP imposes a restriction compared to IFRS.

Estonian GAAP includes a separate standard for investment property. Accounting for investment property is described in ASBG 6 "Investment Property". According to the standard, investment property is initially recognised at cost (ASBG 6.12). After the initial recognition, companies can to choose between the fair value method and the cost method (ASBG 6.16). Under the fair value method all items of investment property are measured at fair value at each balance sheet date. A gain or loss arising from a fair value change is recognised in profit or loss for the period and investment property is not subject to depreciation. (ASBG 6.18.) When the cost method is applied, investment property is accounted in accordance with the accounting rules described in ASBG 5 (ASBG 6.29).

Latvia

In Latvia, Ministry of Finance supervises accounting matters and legislation (PWC, 2013). The primary legal acts regulating accounting and supervision are the act "On Accounting", the "Annual Accounts Law", the "Law on Consolidated Annual Accounts", and the law "On Sworn Auditors". Valuation practices for PPE and investment property are introduced in the Annual Accounts Law. However, the Annual Accounts law does not make a difference between different types of long-term non-financial assets what comes to valuation practices. Accounting rules for both PPE and investment property are included in the accounting for "long-term investments".

According to the Annual Accounts Law, both PPE and investment property are initially recognised at cost (section 26). Subsequently, items of PPE and investment property are measured at cost less accumulated depreciation in the first place (sections 26 & 27). However, if there is a long-term reduction in the value, the asset value must be impaired (section 28). In a similar vein, an item of PPE or investment property can be revalued into a higher value if a long-term increase in value is evident (section 29).

Accounting rules for revalued assets are described in section 29. These rules are similar to the policies described under IAS 16. A long-term reduction in the asset value is recognised in profit or loss. A long-term increase in the asset value bypasses the profit or loss statement and is booked straight against equity under the item "Revaluation reserve for long-term investments". However, an increase in the asset value is recognised in profit or loss to the extent it reverses a revaluation decrease of the same asset(s) previously recognised in profit or loss. Similarly, a decrease in the asset value is recognised in the revaluation reserve to the amount it reverses an increase due to revaluation related to the same asset(s).

Lithuania

In Lithuania, the Authority of Audit and Accounting (AAA) prepares and approves the local Business Accounting Standards (BAS). The Authority of Audit and Accounting operates under the Ministry of Finance. (www.aat.lt.) Accounting policies considering PPE and investment property are represented in BAS 12 "Non-Current Tangible Assets". The standard describes accounting policies for PPE for the most part but it also includes an own chapter for accounting for investment property. Under Lithuanian BAS, accounting for PPE and investment property is very much similar to IFRS.

According to BAS 12, items of PPE are initially measured at cost (BAS 12.10). After the initial recognition, PPE items can be carried either at cost or at a revalued amount (fair value) (BAS 12.40.1 & 12.40.2). Under the historical cost method, items of PPE are carried at the acquisition cost less any accumulated depreciation and impairment losses (BAS 12.42). If an entity applies the revaluation method, an increase in the asset value is recorded in the revaluation reserve under equity (BAS 12.49). A decrease in the asset

value is recognised in profit or loss (BAS 12.50). However, a decrease in the asset value is recorded in the revaluation reserve to the extent it reverses a revaluation increase related to the same asset(s) (BAS 12.51). Also, an increase in the asset value is recognised in profit or loss to the extent it reverses a revaluation decrease related to the same asset(s) (BAS 12.52). If the revaluation method is applied, an entity must revalue its assets regularly, at least in every five years (BAS 12.45).

Accounting rules for investment property are set in BAS 12.84 – 12.97. At the initial recognition, investment property is measured at cost (BAS 12.84). After the recognition, an entity can choose between the cost model and the fair value model (BAS 12.84). If the cost model is applied, investment property is measured at the acquisition cost less any accumulated depreciation and impairment losses (BAS 12.85). Under the fair value model the entity must review the fair value of its investment property at each balance sheet date and changes in the fair value are recognised in profit or loss. When the fair value method is applied depreciation is not calculated for investment property. (BAS 12.88.)

2.2.2 Poland and Slovenia

Poland

The "Accounting act" (Polish GAAP) specifies the accepted accounting principles in Poland. Polish GAAP does not have separate chapters for PPE and investment property. Valuation principles for both PPE and investment property are set in chapter number four.

At the initial recognition, tangible non-current assets are measured at the acquisition cost. Subsequently, items of PPE can be measured either at the acquisition cost less any accumulated depreciation and impairment losses or at revalued amounts. (article 28.) A PPE item can be measured at a revalued amount but the carrying amount should never exceed its fair value. Fair value must be "justified from economic point of view through the expected remaining useful life of the asset". If an asset is revalued, the increase in

value due to revaluation is recognised in the revaluation reserve under equity. (article 31.)

An impairment loss related to a revalued asset is recognised in the revaluation reserve to the extent it reverses a previous increase in value due to revaluation. Any excess of the impairment loss is recognised in profit or loss as an other operating cost like impairment losses in general. (article 32.) Polish GAAP does not explicitly state whether revaluation gains on previously impaired items of PPE are recognised in profit or loss to the extent they reverse the earlier recognised impairment losses. However, this probably the case since otherwise there would be a significant asymmetry in the Polish accounting legislation.

Accounting policies for investment property are close to the accounting rules for PPE. Polish GAAP states that accounting rules applicable to PPE can be applied to investment property. However, investment property can also be measured "at its market price or at fair value determined in another manner". (article 28.) Accordingly, an entity can reflect the market value of its investment property under the Polish accounting rules. On the other hand, Polish GAAP does not include specific accounting rules for investment property only. Therefore, the accounting rules for PPE serve probably as the first choice accounting method for investment property as well.

Slovenia

In Slovenia, rules for accounting are set in the Slovenian Accounting Standards (SAS). In particular, accounting policies for PPE are described in SAS 1 and accounting for investment property is introduced in SAS 6. SASs correspond widely to IFRS what comes to recognition and measurement rules but there are differences related to disclosure requirements (PWC, 2013). The accounting pracitices for PPE and investment property are similar to the rules represented in IFRS.

Items of PPE are initially recognized at cost (SAS 1.10). After the initial recognition, PPE items are measured either at cost less any accumulated depreciation and impairment losses or at revalued amounts. It is also highlighted that an entity must apply same

accounting policies to all assets under the same asset class (SAS 1.24.) Under the revaluation method an asset is measured at fair value less accumulated depreciation and impairment losses (SAS 1.26). It is also emphasized in section 1.26 that entities must review the fair values of revalued assets with sufficient regularity.

When the revaluation method is applied an increase in the asset value is recognised in the revaluation surplus under equity. However, the revaluation increase is recognised in profit or loss to the extent it reverses a revaluation decrease of the same asset. (SAS 1.30.) In general, a revaluation decrease is recognised in profit or loss. However, the decrease is recognised in the revaluation surplus to the extent it reverses a revaluation increase related to the same asset (SAS 1.31.)

Investment property is measured at cost at the initial recognition (SAS 6.6). After the initial recognition an entity can choose between the cost model and the fair value model and the same accounting policy must be applied to all of an entity's investment property (SAS 6.10). If the cost model is applied, accounting for investment property is organized in accordance with SAS 1 cost model.

Under the fair value model changes in the fair value of investment property are recognised in the profit or loss statement for the accounting period (SAS 6.26). Investment property measured at fair value is not subject to depreciation (SAS 6.19).

2.2.4 Summary of the local accounting rules for PPE and investment property

When comparing the local accounting regulations, the first observation is that the local accounting rules for PPE and investment property include a plenty of similarities. However, some local regulations are much more accurate and user-friendly than others. While some accounting standards are basically simplified versions of IFRS (e.g. Estonian GAAP), others may not cover the accounting practices for PPE and investment property in a similar, thorough manner (e.g. Polish GAAP).

There are also significant differences in the quality of the English translations of the accounting standards. Slovenian accounting standards are not even available as English translations or at least there is no official English translation available on the Internet. Nevertheless, all the national accounting standards are available on the Internet and the local standards also include valuation rules for tangible non-current assets.

The fundamental question here is whether tangible non-current assets are valued at cost or at fair value. Therefore, the local valuation practices for PPE and investment property are gathered in table 1.

Table 1. Valuation rules for PPE and investment property under local accounting standards.

Country	Property, plant and equipment	Investment property
Estonia	Cost	Cost / Fair value
Latvia	Cost / Fair value	Cost / Fair value
Lithuania	Cost / Fair value	Cost / Fair value
Poland	Cost / Fair value	Cost / Fair value
Slovenia	Cost / Fair value	Cost / Fair value

Table 1 summarises local accounting rules for subsequent measurement of PPE and investment property. Both of these asset groups are initially recognised at cost without exception. Subsequently, Estonian GAAP is the only local accounting regime that does not allow fair value accounting for PPE and all local accounting practices allow fair value accounting for investment property. However, Latvian and Polish accounting standards do not recognise fair value accounting as its own accounting method but permit asset revaluations.

The fact that the local accounting standards widely permit fair value accounting may not be a major surprise. Some local standards are either based on IFRS (Estonia & Slovenia) or at least closely related to it (Lithuania). Most of the local accounting standards are also relatively new (e.g. Slovenian GAAP, 2006). It is also possible that the past accounting standards have not been enough sophisticated for modern market economy and therefore the current accounting standards are more closely knit to IFRS than to the past accounting regulations.

3. Previous research

In recent years, both the IASB and the Financial Accounting Standards Board (FASB) have promoted the use of fair value accounting. Also, applications of fair value accounting have spread throughout the world with the increasing popularity of IFRS. As said before, under IFRS it is possible to apply fair value accounting not only to financial assets but also to non-financial assets. However, the fair value accounting concept has also its opponents among academics, standard setters and practitioners.

This chapter summarises the main arguments both in favour of and against fair value accounting. Both perspectives have their own sections. At the end of the chapter, results from previous studies focusing on fair value accounting for non-current tangible assets are pulled together.

A good starting point for evaluating fair value accounting is comparing it to historical cost accounting. When comparing these two accounting concepts, the fundamental question lies in the confrontation between relevance and reliability. While fair value accounting probably produces more relevant information to users of financial statements (e.g. Schipper, 2005), historical cost accounting is considered to be superb in terms of reliability (e.g. Krumwiede, 2008; Ronen, 2008). Figure 1 demonstrates the often-anticipated trade-off between relevance and reliability.

Figure 1. Trade-off between relevance and reliability in financial statements in relation to different accounting methods (based on Kinnunen, 2009).
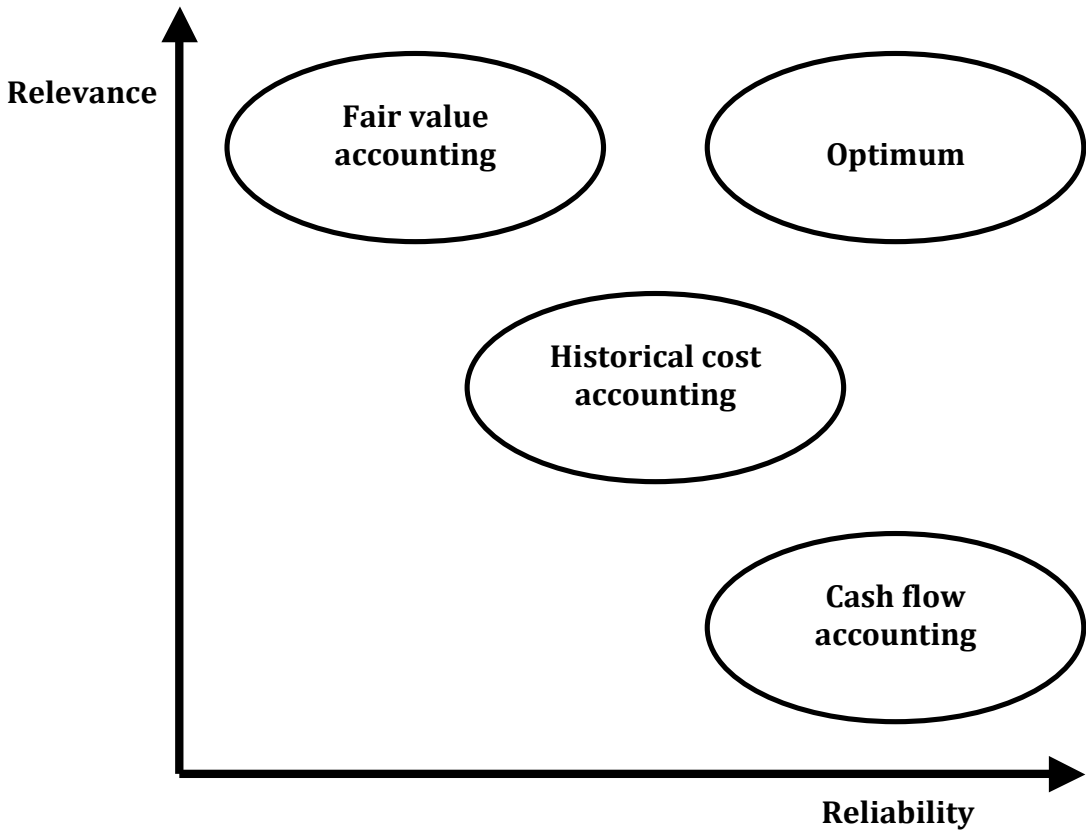
In addition to fair value accounting and cost accounting, figure 1 also includes cash flow accounting. When asset valuations are based on reliable cash flow-based projections, information can be even more reliable than when applying historical cost accounting. However, relevance is far from fair value accounting. The next two sections summarise the most evident arguments in favour of as well as against fair value accounting.

3.1 Arguments for fair value accounting

As stated earlier, use of fair value accounting is often justified on the grounds that it produces more relevant information to users of financial statements. Lately, both FASB and IASB have emphasized relevance as more important than reliability (Johnson, 2005). Therefore it is not surprising that fair value accounting seems overwhelming

compared to historical cost accounting on most qualitative characteristics described in the FASB's conceptual framework (Hermann et al., 2006). Next, I will go through important arguments supporting the use of fair value accounting in addition to the aforementioned relevance perspective.

Schipper (2005) argues that using fair values improves comparability between financial statements. She continues that fair value accounting can also enhance transparency and timeliness of financial information. According to Schipper, fair value measurement does not necessarily require an existing market to be representationally faithful. In line with Schipper's arguments, according to CFA Institute's survey conducted in March 2008, a great majority of the respondents believed fair value information improves transparency of financial institutions. Most of the respondents also agreed that fair values have a positive impact on investor understanding of financial institutions. It has also been argued that by revaluing assets to their fair value managers can reveal their private information on asset values (Aboody et al., 1999).

Already in 1970s, upward revaluations of assets were associated with substantial positive movements in stock prices (Sharpe & Walker, 1975). Later, some studies have linked upward revaluations to long-term stock returns and future cash flows (Easton et al., 1993; Barth & Clinch, 1998). What comes to more recent studies, Danbolt and Rees (2008) concluded that upward revaluations are associated with positive movements in equity prices. Also, fair value accounting can reduce information asymmetry between management and other stakeholders (Muller et al., 2011).

Fair value accounting can help entities represent a true and fair view of their financial positions and results (Krumwiede, 2008). This argument is linked to relevance since relevant book values support representing a true and fair view in the financial statements. In addition, according to some standard setters fair value accounting can help forecasting future cash flows since fair values are future-oriented and therefore indicate the potential for future cash flows (Whittington, 2008).

3.2 Arguments against fair value accounting

This section summarises common arguments against the use of fair value accounting. Besides the obvious concern over reliability, there are also other arguments questioning the use of fair values in accounting. Nevertheless, before moving to other arguments I start with explaining the reasons for the concern over reliability of fair values.

In the centre of the concern over reliability of fair values is the difficulty of determining the true value of assets. According to Ronen (2008), fair values are based on estimates that can lead to materially misstated asset values. He continues that excessive use of fair values may result in a situation where financial statements are prepared to reflect changes in the fair values of assets and liabilities. Therefore, income in profit and loss would become a by-product of value changes. In this case, net income would only reflect changes in the asset values in the given accounting period. In addition, forecasting future profits could become extremely challenging. Ronen also promotes the use of historical cost accounting. He states that historical cost accounting can be future-oriented when profits and costs related to assets are recognised in the periods they arise.

In addition to reliability concerns there are quite a few other arguments against fair value accounting. One concern that is closely related to the reliability of fair value estimates is fair value measurement's vulnerability to management manipulations (Watts, 2006). Management can adjust asset values downwards if profit for the accounting period is negative anyway, for instance. Accordingly, profits for the coming accounting periods are bigger since downward asset revaluations have already been done and depreciation expenses are lower. (Krumwiede, 2008.)

Existence of liquid markets can be seen as a prerequisite to form reliable fair value estimates. However, for non-financial assets liquid markets do not often exist. Therefore, it has been argued that there is not much use for fair values what comes to accounting for tangible assets (Watts, 2006). Also, fair value accounting can increase volatility and sometimes even be inefficient (Plantin, Sapra, and Shin, 2008). What is more, measuring financial assets to market value in illiquid markets can have a negative effect on banks' portfolios and increase the insolvency risk during a financial crisis (Allen & Carletti,

2008). However, both Plantin, Sapra, and Shin's and Allen and Carletti's studies focused on financial assets and therefore their conclusions cannot be applied directly to non-financial assets.

3.3 Previous research on fair value accounting of tangible non-current assets

This part of the study is divided into two subsections. First, I summarise previous studies focusing on asset revaluations and fair value accounting's effect on the book values of balance sheet items. Research on asset revaluations is closely related to fair value accounting since assets are usually revalued to better reflect their market value. Second, the focus is on previous studies on the choice to apply fair value accounting to non-financial assets. Here, factors explaining the choice to use fair value accounting according to previous studies are represented.

3.3.1 Previous studies on asset revaluations and research on fair value accounting's effect on book values

There are several studies focusing on asset revaluations. By contrast, there are no numerous studies on how commitment to fair value accounting for non-financial assets affects book values of balance sheet items and financial ratios. Nevertheless, I start with describing previous studies on asset revaluations and then move to research focusing on fair value accounting for non-financial assets.

Most of the studies focusing on non-financial asset revaluations are based on data from Australia or the UK (e.g. Easton et al., 1993; Danbolt & Rees, 2008). Some studies examine how equity markets respond on upward asset revaluations (e.g. Sharpe & Walker, 1975). Also, there is research on how asset revaluations correlate with long-term returns and future cash flows (e.g. Aboody et al., 1999). However, in this context I represent key findings from a few rather recent studies on asset revaluations.

Cotter and Zimmer (1999) conducted a research focusing on revaluation of property by Australian companies. They examined why some companies recognize upward revaluations in their financial statements rather than just disclosing the revalued amounts in the notes. They claimed that representing an upward asset revaluation on the balance provides a positive signal about the reliability of the revaluation. According to their study, companies are more likely to record upward asset revaluations on their balance sheets if the following conditions apply:

- Market value can be used as a basis for the value of the property.

- Determining the asset value is conducted by an external professional valuer.

- Large proportion of property is land.

The observations above can also apply to the choice of using fair value accounting for non-financial assets under IFRS. First, according to IFRS 13 fair values should be based on quoted prices in active markets in the first place (IFRS 13.76). Second, in case of investment property, entities are encouraged to measure the fair value of their investment property by using an independent valuer that maintains a professional qualification (IAS 40.32). If an independent valuer appraises an entity's investment property and the fair value is higher than the current book value, the entity might be more likely apply the fair value model to its investment property.

Third, according to recent studies (Christensen & Nikolaev, 2013; Muller et al., 2008), companies reporting under IFRS use fair value accounting as a common accounting practice what comes to investment property. Under IFRS, investment property may comprise both land and buildings and the value of land can often be determined quite accurately (IAS 40.5).

Some studies focus on finding motives behind asset revaluations. According to Lin and Peasnell (2000), leverage is an important factor explaining upward revaluations since revaluing assets to a higher value improves debt-to-equity ratio. However, banks usually take possible asset revaluations into account when drawing up loan agreements, which

can diminish the motivation for upward revaluations (e.g. Henderson & Goodwin, 1992). Nevertheless, Lin and Peasnell also remind that upward revaluations can be used to inform the markets that there are better prospects ahead. In a similar vein, companies reporting under IFRS can use the possibility of applying fair value accounting to reflect the market value of their assets to investors. Last, Lin and Peasnell suggest that companies with high fixed asset intensity are more likely to revalue their assets. They explain this finding by stating that revaluing assets is reasonable when a company holds enough fixed assets to generate clearly different numbers through revaluation.

Barlev et al. (2007) conducted a research focusing on motives behind upward revaluations of assets as well. They gathered information from 35 different countries, and concluded that motives behind upward revaluations vary greatly between different countries. Therefore, it is possible that in the context of this study factors explaining the use of fair value accounting are completely different compared to German and British entities, for instance.

Finally, there is previous evidence on how fair value accounting affects asset values. Here, the question is whether companies applying fair value accounting to tangible non-current assets differ from companies applying historical cost accounting in terms of financial ratios. As reflected earlier, Christensen and Nikolaev (2013) focused mainly on the choice to apply fair value accounting. However, they also examined the differences in book-to-market ratios between historical cost and fair value companies.

As a result, Christensen and Nikolaev found that fair value accounting has a significant impact on book-to-market ratios and return on assets (ROA) as well. They concluded that companies applying fair value accounting to either PPE or investment property had higher book values of equity and total assets compared to their market values, respectively. The higher book value of assets compared to market value of assets can be justified on the grounds that fair value accounting better reflects the true value of assets and increases the book-to-market ratio. In a similar vein, upward asset revaluations due to fair value accounting also increase the book value of equity since increases in asset values are recognised directly to the revaluation surplus under equity.

Companies applying fair value accounting had also lower ROA. This is due to the fact that fair value companies tend to have a bigger amount of total assets on their balance sheets compared to historical cost companies. Last, companies applying fair value to PPE had a significantly higher amount of PPE compared to their market value of equity. Companies operating in capital-intensive industries may be more eager to apply fair value accounting to PPE in order to reflect the market value of their assets. Based on previous evidence, big companies are more likely to revalue their assets upwards than small and medium-sized companies (Lin & Peasnell, 2000). In chapter five I will find out whether the company size explains fair value accounting for investment property. What is more, I will also examine whether PPE-heavy companies are more likely to apply fair value accounting to PPE.

3.3.2 Previous research on the choice to apply fair value accounting to non-financial assets

This section summarises previous research on the choice to apply fair value accounting to non-financial assets. This field of research focuses on factors that explain the use of fair value accounting. In general, the question is about how different company characteristics, as leverage, affect the choice of an accounting method. Here, I also reflect the results from recent research on the choice to apply fair value to earlier studies on asset revaluations. This demonstrates the congruence between these two lines of research.

As mentioned earlier, Christensen and Nikolaev (2013) conducted a research focusing on the choice to apply fair value accounting to long-term non-financial assets. That research is based on data from German and British companies reporting under IFRS in 2005 and 2006. As a result, they found that no companies in their sample used fair value accounting for intangible non-current assets. This is striking evidence since their research sample covered a comprehensive set, 1539 companies altogether. However, in respect of this study, the interesting findings concern the tangible non-current assets, namely PPE and investment property.

Christensen and Nikolaev found that only 3% of the companies in their sample used fair value accounting for at least one asset class under PPE after the IFRS adoption. Companies applying fair value to PPE used fair value accounting for the property asset class only with very few exceptions. As for investment property, however, companies were almost equally likely to apply historical cost and fair value accounting. Whether these results hold in the context of this study will be seen in chapter 4.

Statistical numbers establish evidence of how commonly used concept fair value accounting is for non-financial long-term assets. However, it is also important to understand the factors affecting the choice of an accounting method. Christensen and Nikolaev constituted multiple regressions to analyse, which factors affect the choice to use fair value accounting. The following list is based on their most evident findings:

- Institutional differences are important elements when explaining the choice to use fair value.

- Managers are more likely use fair value when costs of reliable estimates are relatively low, i.e. for more liquid assets such as investment property.

- Companies operating in the real estate industry are more likely to apply fair value accounting to investment property.

- Companies with lower investment opportunities are more likely to apply fair value accounting.

- Debt financing maintains a positive association with the use of fair value accounting.

These findings are interesting in respect of this study. First, institutional differences may be important determinants of the choice to use fair value accounting also in the context of this research. There are country-related institutional differences, such as different local regulations that may affect the choice of an accounting method even when all companies report under IFRS. Therefore, I expect that the results in this study will differ

from Christensen and Nikolaev's results based on German and British entities. Second, it can be assumed that managers across the world are more eager to apply fair value accounting when costs of obtaining reliable fair value estimates are low.

Companies operating in the real estate industry are likely to use fair value accounting since they have to be aware of the current investment property market, no matter which countries they are operating in. Moreover, in the real estate industry value changes in investment property convey information about operating performance. Also, lack of investment opportunities can affect companies' eagerness to apply fair value accounting across the boarders. Finally, reliance on debt financing can be positively associated with fair value accounting throughout the world. Christensen and Nikolaev did not mention any country-specific reasons why reliance on debt financing would be associated with the use of fair value in Germany and the UK in particular.

Christensen and Nikolaev's findings can be reflected to earlier studies on asset revaluations as well. First, reliance on debt financing is an important determinant of asset upward revaluations (Gaeremynck & Veugelers, 1999; Lin & Peasnell, 2000). Since upward asset revaluations are conducted to reflect the true value (i.e. fair value) of assets, it is hardly surprising that reliance on debt financing can be associated with both upward revaluations and fair value accounting (Henderson & Goodwin, 1992).

Second, Lin and Peasnell (2000) argued that companies with lower investment opportunities are more likely to conduct upward asset revaluations to distinguish themselves from other low-profitability companies. Based on Christensen and Nikolaev's findings this seems to apply to the use of fair value accounting as well. Third, the finding stating that managers use fair value when costs of obtaining reliable estimates are relatively low is in line with Cotter and Zimmer (1999) (see section 3.3.1). To end up with, institutional differences can be important determinants for both using fair value accounting and upward revaluations. In this instance, Christensen and Nikolaev's findings are in line with Barlev et al. (2007) (see section 3.3.1).

To conclude with, there is exhaustive evidence explaining factors affecting the choice between different accounting methods. What is more, research on the choice to apply

fair value to non-financial assets is closely related to studies on asset revaluations. Same factors that explain asset upward revaluations can also explain the choice to use fair value accounting. However, whether the results of this study support previous evidence can be seen in the following chapter.

4. Accounting for PPE and investment property in practice and the effect of fair value accounting on asset values

This chapter is divided into two sections. Section 4.1 describes how widely used accounting concept fair value accounting is in practice. In this first section I find out how companies measure the both asset groups under research. In addition, I also examine whether companies operating in certain industries are more likely to apply fair value than others. Finally, I study how popular fair value accounting is for different asset classes under PPE.

Section 4.2 focuses on how fair value accounting affects asset values. In this section, I compute a few book-to-market ratios and also compare the ROA between historical cost companies and fair value companies. According to previous studies fair value accounting should have a significant impact on asset values and therefore these financial ratios are supposed to be completely different for these two types of companies.

4.1 Applied accounting methods to PPE and investment property

In this section I describe how firms account for their PPE and investment property in practice. There are two facts making this part of the study particularly interesting. First, companies included in this study are probably more eager to apply fair value to PPE than previous studies would suggest. This prediction is based on the companies' institutional backgrounds. Recall that the sample firms come from countries whose accounting standards allow fair value accounting for PPE to a large extent.

Second, there are no previous international studies focusing on entities domiciled in the chosen countries. Therefore, there is no previous evidence that would support my predictions. However, before going through the research data and sample selection process and describing the research method I will present my hypotheses for this part of the research.

4.1.1 Hypotheses

The hypotheses presented here are based on results from previous studies. Both of the two hypotheses rely on the prediction that liquid markets are needed to form reliable and credible fair value estimates.

H1 = Firms are more likely to apply fair value to investment property than to PPE.

H2 = As for PPE, firms are more likely to apply fair value to property than to plant and equipment.

4.1.2 Research data and sample selection process

All the research data are derived from Thomson One Banker and Worldscope databases. The sample selection process begins with listing all firms that are IFRS compliant and domiciled in the countries under research according to Worldscope's classification. This process produces a list including 531 companies. Next, I verify manually the accounting standards that a given company follows by reading the statement of compliance in the accounting policy section. I also identify the asset valuation practices a company follows by reading the accounting policies for PPE and investment property.

Since the data are derived for the year 2010 I verify the accounting standards and asset valuation practices from each company's annual report for the year 2010. If a company does not have a 2010 annual report available, I will read the annual report for 2011 instead. Accounting policies may also be verified by reading a 2011 semi-annual report if the annual report is not available. It is possible to collect the necessary information

from 2011 financial reports as well since 2010 figures are presented as comparative information. Moreover, if an entity changes its accounting policies compared to the previous accounting period, it must represent those changes in its financial statements according to IFRS. All annual reports must be prepared in English.

As a result, this process yields 234 firms with identifiable accounting policies holding either PPE or investment property or both asset classes. The relatively small sample size compared to the original sample including 531 companies is mainly due to lack of English annual reports among Polish companies. A fair share of Polish companies listed on the Warsaw stock exchange prepare their annual reports in Polish language only. I reckon that the ownership of these firms is mostly in domestic hands. Therefore, the cost of preparing English language annual reports would probably outweigh the achievable benefits. Further common reasons for the diminishing sample size include missing annual reports, incompliance with IFRS and missing accounting policies for PPE and investment property.

4.1.3 Applied accounting methods to PPE and investment property in practice

The distribution of the applied accounting policies is presented in table 2. The table describes the applied valuation practices between the firms included in the study. All the sample companies hold the PPE asset group apart from one holding company. More than 50% of the sample companies hold investment property on their balance sheets.

Table 2. Valuation practices for PPE and investment property.

	PPE		Investment property	
	HC	FV	HC	FV
All firms	196	37	71	56
All firms - %	84 %	16 %	56 %	44 %
Sample size	233		127	
Total no of firms		234		

As for PPE, 16% of the sample firms measure at least one asset class under PPE at fair value. This is a striking result compared to Christensen and Nikolaev's (2013) study that focused on German and British firms after the IFRS adoption. They found that only 3% of the firms included in their sample used fair value accounting for at least one asset class. However, the sample of this study is very much limited compared to Christensen and Nikolaev's in terms of size. On the other hand, such a staggering difference may not be explained only by a smaller sample. Therefore, my prediction is that the popularity of fair value accounting is mainly due to the sample firms' institutional backgrounds.

In line with the H1, firms are more likely to apply fair value accounting to investment property than to PPE. In general, investment property markets are much more liquid than markets for PPE assets. Therefore, this result supports the evidence obtained from previous studies.

There are two more significant observations that are worth mentioning. First, 56% of the sample firms measure their investment property at historical cost. This result is not in line with the institutional backgrounds of the companies. Since all the local accounting standards allow fair value measurement for investment property, one could expect that fair value accounting would be more popular for investment property. Nevertheless, Polish entities have a dominating role in this study and Polish GAAP does not explicitly

offer a fair value model for investment property. However, under Polish GAAP it is possible to measure investment property at fair value and therefore the popularity of the historical cost model is at least slightly surprising.

The second important observation related to investment property concerns the number of firms holding this asset class among the sample firms. 127 (54%) entities had investment property on their balance sheets in 2010. The relatively big number of companies holding investment property can be related to the industry distribution among the sample firms and it definitely needs further research. Therefore, in the next section I present the industry distributions among the sample firms and I will also find out what asset classes are measured at fair value under PPE.

4.1.4 Valuation practices across industries and accounting for different asset classes

In this section I represent how historical cost accounting and fair value accounting are applied across different industries among the sample firms. What is more, I also find out which asset classes are most often measured at fair value. According to H2 firms should be more likely to apply fair value accounting to property than plant and equipment. Christensen and Nikolaev (2013) stated that German and British firms used fair value accounting almost exclusively for property and not for plant and equipment under the PPE asset group. Whether this observation holds in the context of this study will be verified in this section.

First, however, I start with describing how historical cost accounting and fair value accounting are applied across different industries. Table 3 demonstrates how the sample firms account for the PPE and investment property asset groups. Firms that measure at least one asset class at fair value under PPE are classified as fair value companies and the rest are historical cost companies.

Table 3. Accounting practices for PPE and investment property across industries.

SIC Code	Sample PPE	%	PPE HC	%	FV	%	Sample Inv prop	%	Investment property HC	%	FV	%
Agriculture, forestry and fishing (01-09)	5	2	3	60	2	40	4	3	1	25	3	75
Mining (10-14)	9	4	9	100	0	0	5	4	4	80	1	20
Construction (15-17)	36	15	32	89	4	11	26	20	12	46	14	54
Manufacturing (20-39)	81	35	65	80	16	20	40	31	22	55	18	45
Transportation, communications, electric, gas and sanitary service (40-49)	35	15	30	86	5	14	18	14	12	67	6	33
Wholesale trade (50-51)	11	5	8	73	3	27	8	6	5	63	3	38
Retail trade (52-59)	3	1	3	100	0	0	2	2	1	50	1	50
Finance and insurance (60-67)	39	17	35	90	4	10	21	17	11	52	10	48
Services (70-89)	13	6	11	85	2	15	3	2	3	100	0	0
Public administration and other (91-99)	1	0	0	0	1	100	0	0	0	-	0	-
TOTAL	233	100	196	84	37	16	127	100	71	56	56	44

Even though fair value accounting seems to be much more popular among the sample companies than previous studies would suggest, it is worth mentioning that only two entities measure the whole PPE asset group at fair value. Therefore, historical cost is definitely the dominating accounting method for PPE across all industries. However, the fact that companies operating in manufacturing industries are more likely to apply fair

value is an interesting finding. Recall that according to previous research PPE-heavy companies are more likely to measure PPE at fair value. Whether the PPE-to-total assets ratio explains the choice to use of fair value accounting will be tested in chapter five.

As for investment property, classifying companies in different groups is rather simple. Firms that measure investment property at historical cost are historical cost companies and firms measuring investment property at fair value are classified as fair value companies. Among those industries where at least 10 companies hold investment property there are no industries where fair value accounting would be the dominant accounting method by a significant margin. Therefore, historical cost dominates fair value also in the measurement of investment property.

The significant share of companies holding investment property is at least to some extent due to the following facts. First, companies operating in construction and finance and insurance industries cover approximately one third of the total sample. Companies operating in these industries are more likely to hold investment property than companies in general. In addition, 35% of the sample companies operate in manufacturing industries and manufacturing companies often hold properties on their balance sheets.

Finally, the sample companies hold relatively big amounts of total assets on their balance sheets. Total assets for an average sample company equal to almost EUR 1,6 billion. Considering these facts, the relatively big number of sample companies holding investment property may not be a big surprise.

Next I will find out how the sample firms account for different asset classes under PPE. Here, I expect that firms are much more likely to apply fair value accounting to property than to plant and equipment. It is even possible that fair value accounting is applied almost exclusively to property. Table 4 represents how fair value accounting is applied to different asset classes under the PPE asset group.

Table 4. Different asset classes measured at fair value under PPE.

Asset class	Number of firms	%
Property	35	97 %
Plant	7	19 %
Equipment	5	14 %
Total sample	36	

Among all the sample firms, there are 37 companies that apply fair value accounting to at least one asset class under PPE. However, one firm was ruled out from table 4 since its accounting policies do not state precisely which assets are measured at fair value under PPE. Nevertheless, the result is in line with H2. Apart from one company, all the fair value companies included in the PPE sample measure property (land and/or buildings) at fair value.

The relatively high number of companies measuring plant and equipment at fair value is due to the fact that two companies measure the whole PPE at fair value and three companies measure the whole PPE excluding construction in progress at fair value. Apart from these five firms there are only three entities that explicitly state, which items of plant and equipment are measured at fair value. These entities comprehend one shipping company and two energy companies.

4.2 The effect of fair value accounting on asset values

In this section I examine how fair value accounting affects the book value of assets. The analysis is carried out by comparing book-to-market ratios and profitability between historical cost companies and fair value companies. However, before describing the analysis and presenting the results I start with the hypotheses.

4.2.1 Hypotheses

The hypotheses presented here are in line with Christensen and Nikolaev's (2013) findings concerning how fair value accounting affects the book value of assets. These two hypotheses apply to both investment property and PPE samples.

H1: Fair value companies have higher book-to-market ratios than historical cost companies.

H2: Fair value companies have lower return on assets (ROA) than historical cost companies.

4.2.2 Fair value accounting and the book value of assets in practice

According to the above-mentioned hypotheses fair value accounting should have a significant impact on a company's balance sheet. I test the hypotheses by forming two samples. Panel A presents a sample of 115 firms holding investment property. This sample includes companies that hold investment property and for which market value of equity is available. Moreover, three companies are ruled out due to very divergent financial ratios.

Panel B is based on a matched sample of companies between fair value companies and historical cost companies for the PPE asset group. I match each fair value company with a historical cost company based on two-digit industry group and the log of market value of equity and then take the closest match. As a result, the PPE sample comprehends 64 companies. The requirement of available market value of equity is the main reason for limiting the sample size compared to the total sample. In addition, two companies were ruled out due to extremely divergent numbers. Nevertheless, the results are presented in table 5 and definitions for the computed variables are explained after the table.

Table 5. The effect of fair value accounting on asset values.

Statistics	BTM	TA/MKT(TA)	ROA	PPE/MKT(EQUITY)
Panel A: Investment property				
Mean:				
Historical cost mean	1,01	0,95	0,03	
Fair value mean	1,10	1,00	0,02	
Difference	-0,10	-0,05	0,01	
Difference %	-10 %	-6 %	28 %	
Median:				
Historical cost median	0,85	0,92	0,03	
Fair value median	0,98	0,99	0,02	
Difference	-0,12	-0,07	0,01	
Difference %	-15 %	-7 %	25 %	
Panel B: PPE				
Mean:				
Historical cost mean	0,95	0,97	0,03	0,60
Fair value mean	1,35	1,09	0,02	1,24
Difference	-0,40	-0,11	0,01	-0,64
Difference %	-42 %	-11 %	33 %	-106 %
Median:				
Historical cost median	0,85	0,93	0,03	0,34
Fair value median	1,03	1,02	0,02	0,87
Difference	-0,18	-0,08	0,01	-0,53
Difference %	-21 %	-9 %	37 %	-153 %

Definitions for the variables included in table 5:

BTM = Book value of equity / Market value of equity

TA/MKT(TA) = Total assets / (Market value of equity + Book value of liabilities)

ROA = Net income / Total assets

PPE / MKT(EQUITY) = Book value of PPE / Market value of equity

In line with H1, fair value companies have higher book-to-market ratios than historical cost companies under the both asset groups. H2 is true as well since fair value companies have lower ROA than historical cost companies. An interesting finding is that the differences in book-to-market ratios and ROA are relatively bigger in the PPE sample than in the investment property sample. However, it is not surprising that fair value accounting for PPE decreases ROA significantly since upward revaluations increase the value of assets but do not have effect on the net income. For investment property the effect is smaller since fair value accounting for this asset group affects both asset values and the net income.

One reason that can explain why differences in book-to-market ratios are relatively bigger in the PPE sample is the fact that part of the fair value companies measure investment property at fair value as well. 22 fair value companies included in the PPE sample hold also investment property. Out of these 22 fair value companies 18 entities measure investment property at fair value and only 4 entities at historical cost. By contrast, only 8 companies out of the 20 historical cost companies that hold investment property measure this asset group at fair value.

As a conclusion, the evidence in table 5 suggests that the decision to use fair value accounting is associated with remarkable differences in companies' balance sheets. These differences are reflected in fair value companies' much higher book-to-market ratios. Furthermore, fair value accounting decreases profitability as well.

5. What explains the choice to use fair value accounting?

So far I have found out how popular accounting concept fair value accounting is for PPE and investment property among the companies included in the study. What is more, I have also concluded that fair value accounting is associated with significant differences in firms' balance sheets. Fair value companies are a far less conservative in terms of book-to-market ratios and the choice to use fair value accounting decreases the return on assets as well.

A question that still remains unanswered is what explains the choice to use fair value accounting for PPE and investment property. In this chapter I examine the choice to use fair value accounting for the both asset groups. Section 5.1 focuses on investment property and section 5.2 deals with PPE. Each asset group has its own section since the determinants of explaining the choice to use fair value are expected to be different for each of the asset groups.

5.1 What explains the choice to use fair value accounting for investment property?

In this section the focus is on examining the determinants of the choice to use fair value accounting for investment property. This part of the study is organised as follows; first I present the hypotheses. Second, there is a short description of the research data. Third, the research methods are explained. Last, I describe and analyse the results.

5.1.1 Hypotheses

The hypotheses that are represented here are based on findings observed in previous studies. In particular, these hypotheses are in line with Christensen and Nikolaev's (2013) findings concerning the determinants of the choice to use fair value.

H1: Companies are more likely to apply fair value accounting to investment property if real estate is one of their primary activities.

H2: Companies applying fair value accounting to investment property rely more heavily on debt.

5.1.2 Research data

The research data is based on the sample including companies that hold investment property. In total, this sample comprises 127 companies. However, missing information and extremely divergent numbers for a few companies limit the sample. As a result, I start the descriptive and correlation analyses with the sample as in section 4.2.2. This sample comprehends 115 companies. Missing information for debt-to-operating income and current ratio variables further limit the sample in these specifications. Current ratio can be found for 100 companies and debt-to-operating income for 112 companies, respectively.

As for the logistic regression analysis, the sample includes 97 companies in total. This analysis includes only those companies for whom it is possible to compute all the variables included in the logistic regression model. Within this sample, 43 (44%) companies measure investment property at fair value and 54 (56%) companies apply historical cost to investment property.

5.1.3 Research methods

The primary research method that is applied here is the logistic regression analysis. However, before the logistic regression analysis there is a short descriptive analysis and a correlation analysis as well. In the logistic regression analysis, the dependent variable is the choice to apply fair value accounting to investment property. Both the logistic regression and the correlation analyses are conducted by using Gretl software.

Logistic regression model of the choice to apply fair value accounting to investment property

Regression analysis is a statistical process that is used to estimate the relationships among variables. In regression analysis, the dependent variable is dichotomous and binary coded. Therefore, the outcome for the dependent variable is always either 0 or 1. The relationship between independent variables and the dependent variable is expected to be logistic (S-curve) rather than linear. In practice, regression analysis helps to understand how the value of the dependent variable changes when any one of the independent variables varies.

In the logistic regression analysis, the dependent variable is determined as follows:

0 = Investment property is measured at historical cost.

1 = Investment property is measured at fair value.

The logistic regression applied here is represented below. All the dependent variables included in the model are explained below the regression equation.

Prob (FVInvPr) =

$a + b_1 SIC65 + b_2 MktLev + b_3 LevBook + b_4 Size + b_5 ROA + b_6 Current + b_7 DebtToOi + e,$ (1)

where

SIC65 = 1 if SIC code 65 is among a company's first five SIC codes, 0 otherwise

SIZE = LOG Market capitalization

MKTLEV = Total liabilities / (Market value of equity + Total liabilities)

LEVBOOK = Total liabilities / Total assets

ROA = Net income / Total assets

Current = Current assets / Current liabilities (=Current ratio)

DebtToOi = Total liabilities / Operating income

5.1.4 Results and analysis

I start this section with a descriptive analysis where I present summary statistics for the logistic regression analysis. After the descriptive analysis I analyse the regression variables by examining correlation between them. Finally, I present the results from the logistic regression analysis.

Descriptive analysis

The results from the descriptive analysis are gathered in table 6. The table includes all the variables that are used in the logistic regression analysis. Based on the results, there are significant differences between the companies included in the analysis. Some companies rely heavily on debt financing whereas other companies are very much equity financed. However, the average book leverage (and MktLev) is just over 50%, which is not either particularly low or high ratio. The median for ROA (2%) indicates that the companies included in the sample are quite unprofitable by this measurement. Last, the SIC65 variable tells that real estate is one of the primary operating industries for approximately 12% of the companies.

Table 6. Summary statistics for the logistic regression analysis for investment property.

Variable	AVG	StdDev	Min	Max	Median	N
FVInvPr	0,44	0,50	0,00	1,00	0,00	115
SIC65	0,12	0,33	0,00	1,00	0,00	115
Size	8,20	0,76	6,17	10,14	8,17	115
MktLev	0,52	0,23	0,07	0,96	0,52	115
LevBook	0,55	0,22	0,06	1,06	0,55	115
ROA	0,03	0,08	-0,35	0,26	0,02	115
Current	0,71	0,73	0,08	4,14	0,43	100
DebtToOi	24,96	927,69	-7 455,85	5 281,83	10,19	112

Correlation analysis

The correlations between different variables are gathered in table 7. There is a strong correlation between the SIC65 industry code and fair value accounting. This correlation is also statistically significant at less than 1% level. Therefore, it seems evident that companies operating in the real estate industry are eager to apply fair value to investment property. I expect that the real estate industry code will have statistical significance also at explaining the choice to use fair value accounting later in this chapter.

Another important finding in the correlation analysis is the negative correlation between the debt-to-operating income variable and fair value accounting. The correlation is significant at less than 10% level. This finding is interesting since H2 suggests that fair value accounting should be associated with debt finance. On the other hand, other leverage variables (MktLev & LevBook) do not have any statistically significant correlation with fair value accounting.

I find some evidence that ROA is negatively correlated with fair value accounting for investment property. This evidence, however, is very much minor and also statistically insignificant. Finally, I test whether company size and current ratio have any correlation with fair value accounting. The finding that company size is negatively correlated with fair value is not surprising based on the results from previous studies. On the other hand, positive correlation between the current ratio and fair value is somewhat unexpected. However, neither of these last two findings has a strong correlation with fair value and therefore they do not maintain any statistical significance.

Table 7. Correlation table for investment property. ***, **, * indicate statistically significant correlation with fair value accounting at less than 1%, 5%, and 10% level.

Variable	FVInvPr	SIC65	Size	MktLev	LevBook	ROA	Current	DebtToOi
FVInvPr	1,000							
SIC65	**0,256**	1,000						
	0,006***							
Size	-0,102	-0,150	1,000					
	0,280	0,110						
MktLev	-0,102	-0,146	0,242	1,000				
	0,278	0,120	0,009					
LevBook	0,057	-0,031	0,140	0,003	1,000			
	0,544	0,746	0,135	0,972				
ROA	-0,054	-0,017	0,171	0,447	-0,287	1,000		
	0,566	0,853	0,068	0,000	0,002			
Current	0,101	-0,026	-0,136	0,001	-0,291	0,034	1,000	
	0,316	0,794	0,179	0,992	0,003	0,738		
DebtToOi	**-0,176**	-0,215	-0,048	-0,043	0,029	-0,047	-0,042	1,000
	0,064*	0,023	0,616	0,650	0,763	0,619	0,685	

Logistic regression analysis

Here, I explain the choice to use fair value accounting for investment property. This choice is analyzed by applying the logistic regression model. I expect strong support for H1 since the SIC65 industry code correlates strongly with fair value accounting. On the other hand, based on the results of the previously carried correlation analysis, support for H2 might be much more minor.

Before moving on to explain the results, I will have a few comments on the applied analysis. First, the logistic regression analysis predicts correctly approximately 64% of the cases. The most common mistake occurs when the model predicts that historical cost is used while the company actually applies fair value. Second, there is no multicollinearity between the predictor variables.

I apply two different goodness of fit tests to the regression model. First, the likelihood ratio test (Chi-square) provides a result that is significant at less than 5% level. This result indicates that the goodness of fit for the logistic regression model is adequate when explaining the choice to use fair value. The McFadden R-squared test indicates that the independent variables can explain only a low amount of the variation in the choice to apply fair value accounting. The outcome of the McFadden R-squared test, however, is not surprising when the results of the logistic regression are looked in more detail.

Table 8 summarises the results from the logistic regression analysis. Only the SIC65 industry code maintains a statistically significant coefficient. This finding gives strong support to H1, which suggests that companies operating in the real estate industry are more likely to apply fair value accounting to investment property.

On the other hand, I find only minor support for H2. The book leverage variable imposes a positive coefficient but this finding is not statistically significant. What is more, the coefficient for market leverage is negative. Among the other variables, it is an interesting finding that current ratio has a positive coefficient and is not far from being statistically significant at less than 10% level. Finally, the debt-to-operating income (DebtToOi) ratio

maintains a negative coefficient. However, as opposed to the correlation analysis, this variable does not have any statistical significance.

Table 8. Results of the logistic regression analysis (investment property).

Variable	Expected coefficient	Coefficient	P-value	N=97
SIC65	+	1,913	0,028	
Size	-	-0,050	0,883	
MktLev	+	-0,338	0,533	
LevBook	+	1,820	0,152	
ROA	-	0,231	0,939	
Current	-	0,422	0,188	
DebtToOi	+	-0,001	0,260	
Likelyhood Chi-square		14,240	0,047	
McFadden R-squared		0,107		

5.2 What explains the choice to use fair value accounting for PPE?

While the investment property sample includes a bigger number of companies, an understanding of the choice to use fair value accounting for PPE is probably more interesting. First, almost every company carries this asset group on its balance sheet. Second, it is possible to collect the data for the fair value revaluation reserve from the annual reports. A detailed description of this procedure is explained under research methods.

This part of the study is organised in the same manner as the previous part that concerns investment property. First, I present the hypotheses. After presenting the

hypotheses, research data and research methods are described. Finally, there is a section for results and analysis. The results and analysis section consists of three parts including a descriptive analysis, a correlation analysis, and a logistic regression analysis.

5.2.1 Hypotheses

The hypotheses represented here are in line with empirical findings from previous studies and they are formed based on Christensen and Nikolaev's (2013) results. Supporting evidence for H1 was already found in section 4.2.2. Whether this evidence is statistically significant, however, remains an open question. H3 is probably the most interesting hypothesis here. It is based on an expectation that companies with relatively bigger amounts of PPE on their balance sheets are more eager reflect the "true value" of this asset group.

H1: Companies that apply fair value accounting to investment property are more likely to apply fair value accounting to PPE as well.

H2: Fair value companies rely more on debt financing than historical cost companies.

H3: Fair value companies are more PPE-heavy than historical cost companies.

5.2.2 Research data

I start forming the sample with the same set of matched companies that was already used in section 4.2.2. Each fair value company is matched with a historical cost company based on two-digit industry group and LOG of market value of equity. As for descriptive and correlation analyses, one fair value company is ruled out of the sample since it is not possible determine which part of its revaluation reserve is due to revaluation of PPE. After ruling out this company and its matched company the sample comprehends 62 entities. Missing information for current ratio and debt-to-operating income further limits the sample in these specifications.

The sample for the logistic regression analysis is more limited. This sample includes only companies with available information for all the computed variables. After ruling out all the companies with missing information and their matched companies as well, the number of companies equals to 52. Last, it is also worth mentioning that for a few fair value companies, the revaluation reserve is zero. These companies have probably not carried out any significant revaluations of PPE in the recent years. However, also the fair value companies without any PPE-related revaluation reserve are included in the sample since they measure at least one asset class under PPE at fair value.

5.2.3 Research methods

The same research methods that were applied to investment property are applied to PPE as well. The logistic regression model is used to explain the choice to use fair value accounting for PPE. However, before explaining the choice of an accounting method by applying the logistic regression model, I start with a descriptive analysis and then move to a correlation analysis.

Logistic regression model of the choice to apply fair value accounting to PPE

A logistic regression analysis is applied to explain the choice to use fair value accounting for PPE. The model is the same that was used to explain the choice to use fair value accounting for investment property. However, in this context the dependent variable is the choice of an accounting method for PPE. Also the independent variables are different since there should be different factors explaining the use of fair value accounting for PPE than for investment property. As for PPE, the dependent variable is determined as follows:

0 = The whole PPE asset group is measured at historical cost.

1 = At least one asset class under PPE is measured at fair value.

For fair value companies, it is possible to collect the data for the fair value revaluation reserve from the annual reports. Therefore, it is possible to compute the book values of equity, PPE, and total assets as if companies used historical cost accounting. By deducting the fair value revaluation reserve it is possible to avoid the possible mechanical relation between book-to-market ratios and fair value indicators. It is also possible to compute the ratio of PPE to total assets to test whether PPE-heavy companies are more likely to apply fair value accounting to PPE. The applied logistic regression model and explanations for the independent variables are described next.

Prob (FVPPE) =

$a + b_1BTM + b_2MktLev + b_3LevBook + b_4PPEA + b_5ROA + b_6FairInvPr + b_7Current + b_8DebtToOi + e,$ (2)

where

BTM = (Book value of equity – Revaluation reserve) / Market value of equity

MktLev = Total liabilities / (Market value of equity + Total liabilities)

LevBook = Total liabilities / (Total assets – Revaluation reserve)

PPEA = (PPE – Revaluation reserve) / (Total assets – Revaluation reserve)

ROA = Net income / (Total assets – Revaluation reserve)

FVInvPr = 1 if investment property is measured at fair value, 0 if investment property is measured at cost

Current = Current assets / Current liabilities (=Current ratio)

DebtToOi = Total liabilities / Operating income

5.2.4 Results and analysis

The results and analysis are organised in the same manner as in the investment property section. First, I start with a descriptive analysis before moving to a correlation analysis. Finally, I present the results of the logistic regression analysis.

Descriptive analysis

All the variables used in the logistic regression analysis are gathered in table 9. There are a few findings that arouse special interest. First, 40% of the sample companies hold investment property and measure it at fair value. Since most of these companies apply fair value to PPE, I expect a strong supportive evidence for H1. Second, the PPEA ratio offers a huge variation. There is one company with a balance sheet consisting almost exclusively from the PPE asset group. At the other end, one company has only a fraction of its balance sheet consisting of PPE.

Third, the sample companies have very much similar book leverage and market leverage ratios, both indicators being approximately 50%. These indicators are also almost equal to the leverage indicators for investment property. Finally, the book-to-market ratio for equity (BTM) indicates that deducting the fair value revaluation reserve from the fair value companies' equity can have a major impact on this ratio. In overall, the mean for the BTM ratio is quite close to the historical cost companies' ratio presented in table 5.

Table 9. Summary statistics for the logistic regression analysis (PPE).

Variable	AVG	StdDev	Min	Max	Median	N
FVPPE	0,50	0,50	0,00	1,00	0,50	62
FairInvPr	0,40	0,49	0,00	1,00	0,00	62
PPEA	0,32	0,25	0,00	0,88	0,28	62
LevBook	0,54	0,20	0,12	0,95	0,54	62
MktLev	0,52	0,19	0,07	0,94	0,50	62
BTM	1,02	0,58	0,25	3,07	0,91	62
ROA	0,03	0,05	-0,16	0,15	0,03	62
Current	0,89	1,01	0,09	4,86	0,47	58
DebtToOi	19,04	405,05	-1 145,11	2 641,84	10,43	56

Correlation analysis

Correlations between different variables are gathered in table 10. In the correlation table, only the fair value accounting dummy variable for investment property holds a statistically significant correlation with fair value accounting. The PPEA variable correlates positively with fair value accounting and is close to the 10% level of statistical significance. All the rest of the variables are far from being statistically significant. Given these results, I expect strong support for H1 and at least moderate support for H3 also in the logistic regression analysis. On the other hand, it seems that the anticipated association between debt-financing and fair value accounting does not receive much support here.

Table 10. Correlation table for PPE. ***, **, * indicate statistically significant correlation with fair value accounting at less than 1%, 5%, and 10% level.

Variable	FVPPE	FVInvPr	PPEA	MktLev	LevBook	BTM	ROA	Current	DebtToOi
FVPPE	1,000								
FairInvPr	**0,296**	1,000							
	0,020**								
PPEA	0,199	-0,289	1,000						
	0,122	0,023							
MktLev	0,082	0,256	-0,176	1,000					
	0,525	0,045	0,171						
LevBook	0,030	0,248	-0,143	0,817	1,000				
	0,816	0,052	0,267	0,000					
BTM	0,107	0,004	0,002	0,259	-0,301	1,000			
	0,410	0,973	0,985	0,042	0,017				
ROA	-0,064	-0,100	-0,160	-0,352	-0,216	-0,137	1,000		
	0,622	0,440	0,213	0,005	0,092	0,289			
Current	-0,029	-0,007	-0,123	-0,081	-0,373	0,496	0,130	1,000	
	0,831	0,960	0,357	0,547	0,004	0,000	0,330		
DebtToOi	0,091	-0,138	0,294	-0,190	-0,169	-0,042	-0,039	-0,040	1,000
	0,506	0,312	0,028	0,162	0,212	0,761	0,778	0,778	

An interesting finding is that each and every variable correlates with fair value accounting either in line with the hypotheses or in the same manner as in previous researches. First, the book leverage and market leverage ratios are positively correlated in line with H2. However, these correlations are not strong and therefore not even close to statistical significance. Second, book-to-market value of equity is also positively

correlated. Third, debt-to-operating income ratio maintains a positive correlation as well.

Finally, both ROA and current ratio are negatively associated with fair value accounting. These findings support previous research and suggest that fair value companies are usually less profitable and they have a worse liquidity as well. In overall, the results in the correlation table indicate that the logistic regression model may well produce results that are in line with the hypotheses.

Logistic regression analysis

The choice to apply fair value to PPE seems to be associated with fundamental differences between fair value companies and historical cost companies. In this context, also the logistic regression model explains better the choice to apply fair value accounting than in the investment property section. The model predicts the applied accounting method correctly in approximately 69% of the cases. In the PPE sample, the most common mistake happens when the model predicts that fair is used when the company actually applies historical cost.

In the regression analysis, there is multicollinearity between the market leverage (MktLev) and book leverage (LevBook) variables. However, when I run the regression analysis without the MktLev and LevBook variables, the results are very much the same as when these two variables are included in the analysis. I find some changes in the coefficients but the P-values for the variables with statistical significance remain in the same level. Therefore, the detected multicollinearity does not have any statistically significant impact on the results of the analysis.

As with the investment property sample, two goodness of fit tests are applied to the regression analysis. First, the result of the likelihood Chi-square test indicates that the applied model fits the sample adequately. Here, the Chi-square test provides a result that is statistically significant at less than 5% level. Second, the McFadden R-squared test imposes a much higher value than in the investment property sample. The result of this test equals now to just over 26%. In practice, the result of the McFadden R-squared

test means that the independent variables can explain more than 26% of the variation in the choice to apply fair value accounting.

The results of the logistic regression analysis are gathered in table 11. These results give very strong support to H1. Indeed, companies that apply fair value to investment property are much more likely to apply fair value to PPE as well. This finding is also statistically significant at less than 1% level.

Table 11. Results of the logistic regression analysis for PPE.

Variable	Expected coefficient	Coefficient	P-value	N=52
FVInvPr	+	2,701	0,003	
PPEA	+	4,561	0,024	
MktLev	+	3,068	0,740	
LevBook	+	-4,959	0,577	
BTM	+	0,385	0,862	
ROA	-	1,394	0,817	
Current	-	-0,469	0,321	
DebtToOi	+	0,001	0,594	
Likelyhood Chi-square		18,808	0,016	
McFadden R-squared		0,261		

In general, significant support for H1 was very much expected. Recall that I already received supportive evidence for H1 in section 4.2.2 where I concluded that most fair value companies not only hold investment property but also measure it at fair value. Since almost all the fair value companies apply fair value to property under the PPE

asset group, it is logical that these companies measure their investment property at fair value as well.

It is evident that companies whose balance sheets consist largely from PPE are more likely to apply fair value. The strong coefficient of the PPEA variable is also significant at less than 5% level. This finding is completely in line with H3 and suggests that PPE-heavy companies are indeed willing to reflect the market value of the significant assets on their balance sheets. In addition, the finding that PPE-heavy companies are more likely to apply fair value supports results from prior studies focusing on the choice to apply fair value accounting and asset revaluations.

I receive only minor support for H2. The MktLev variable does have a positive coefficient but this finding is not statistically significant. By contrast, book leverage maintains a negative coefficient, which is not in line with H2 at all. However, this result does not hold any statistical significance either. Last, the DebtToOi variable has a slightly positive coefficient but this finding does not give much support to H2, if any.

The current ratio (Current) and book-to-market value of equity (BTM) both have expected coefficients with fair value accounting. Based on results from previous studies, fair value companies are expected to be less liquid and their book value of equity is allegedly relatively higher. However, these findings do not maintain any statistical significance.

Finally, the ROA variable has an unexpected coefficient. I expected that fair value accounting would have a negative coefficient with return on assets but in this context the coefficient is positive instead. Nevertheless, this finding might just highlight fair value accounting's significant impact on asset values recalling that the ROA variable is computed here net of revaluation reserve. However, when looking deeper into this issue, I find that the average ROA is 37% lower for fair value companies even when the variable is computed net of revaluation reserve. Apparently, it seems that fair value companies differ significantly from historical cost companies in terms of ROA even though this difference maintains an unexpected coefficient and does not have any statistical significance in the regression model.

As a conclusion, it seems evident that companies applying fair value to investment property are much more likely to apply fair value to at least one asset class under PPE as well. In addition, PPE-heavy companies are willing reflect the market value of items under this asset group. However, the results provide only very moderate support for the anticipated association between fair value accounting and debt finance.

6. Summary and discussion

I study the choice between historical cost accounting and fair value accounting for PPE and investment property in five different CEE-countries. All companies included in the study report under IFRS. As a result, I find that 84% of the companies apply historical cost to the entire PPE asset group whereas 16% of the companies apply fair value to at least one asset class under PPE. What is more, only three companies in the entire sample measure the whole PPE at fair value. Therefore, it is evident that historical cost accounting still dominates fair value accounting.

On the other hand, it is an intriguing fact that the sample companies apply fair value accounting to PPE much more widely than the previous studies would suggest. In their recent study, Christensen and Nikolaev (2013) observed that only 3% of their sample companies measured at least one asset class under PPE at fair value. Even though their sample consisting of British and German companies was considerably more comprehensive than the sample in this study, the difference in the use of fair value accounting is still significant.

As for investment property, 56% of the companies measure this asset group at historical cost and 44% of the companies rely on fair value accounting. Based on these findings, fair value accounting for investment property seems to be less popular among the sample companies than what Christensen and Nikolaev observed when they studied British and German companies. In their study, 53% of the companies applied historical cost and 47% of the companies relied on fair value.

Before explaining the choice of an accounting method I study the effect of fair value accounting on asset values. I conclude that fair value accounting is associated with remarkable differences in companies' balance sheets. In the both asset groups, fair value companies have considerably higher book-to-market ratios for both equity and total assets. In addition, fair value companies maintain a lower return on assets.

The differences in book-to-market ratios and profitability between fair value companies and historical cost companies are distinctly bigger in the PPE sample compared to the investment property sample. These differences can be at least partially due to following facts. First, fair value accounting for PPE diminishes ROA more than fair value accounting for investment property. This effect is due to the fact that upward revaluations for PPE assets bypass profit and loss statement. Second, most of the fair value companies included in the PPE sample hold investment property and measure it fair value. This further increases the book-to-market ratios and diminishes ROA. Finally, the PPE-to-market value of equity ratio is computed for the PPE sample exclusively. As a result, this ratio is significantly higher for fair value companies.

I study the choice of an accounting method by applying a logistic regression analysis. In line with the results from previous research, companies operating in the real estate industry are much more likely to apply fair value to investment property than the rest of the companies. This finding is also significant at less than 1% level. By contrast, I do not find much supporting evidence for the hypothesis that fair value accounting would have a strong association with debt finance. This lack of support for debt finance may be due to the limited sample size or institutional differences. After all, the real estate industry code is the only variable that explains the choice to use fair value accounting for investment property at a statistically significant level.

As for the PPE asset group, the logistic regression analysis maintains more explanatory power and the results give stronger support to the hypotheses as well. In compliance with the hypotheses, companies applying fair value to investment property are much more likely to apply fair value to PPE. It is logical that companies applying fair value to investment property tend measure their property under PPE at fair value as well.

What is more, fair value companies are also more PPE-heavy than historical cost companies. The PPEA ratio is positively associated with fair value accounting and the coefficient is also statistically significant at less than 5% level. This finding supports previous evidence and highlights the fact that companies holding significant amounts of PPE on their balance sheets are more willing to reflect the market value of this asset group.

As for PPE, I do not find much supporting evidence for the expected link between fair value accounting and debt finance. Fair value accounting is positively associated with market leverage but this finding is not statistically significant. In addition, book leverage maintains a negative coefficient with fair value, which further diminishes the supportive evidence for the debt hypothesis. Debt-to-operating income variable has a slightly positive coefficient but this finding is not statistically significant.

As for the rest of the variables included in the regression for PPE, all the variables have expected coefficient trends apart from ROA. The ROA variable has a positive coefficient even though I expected the coefficient to be negative. However, since the average ROA (net of revaluation reserve) is 37% lower for the fair value companies it seems that the logistic regression model is just not able to explain this difference.

Nevertheless, the fact that most of variables have expected coefficient trends supports the obtained evidence from previous studies. This finding also clarifies that the same variables can explain the choice to use fair value accounting in different settings and between companies with different institutional backgrounds.

Finally, I present a few thoughts for further research. First, the sample size in this study is somewhat limited. Therefore, it would be interesting to conduct a similar study with a broader set of companies. However, this would require either obtaining the necessary language skills or retaining enough time for translating the annual reports. Recall that missing English language annual reports are the main reason for the limited sample size.

Second, the study could be broadened to cover more countries among the CEE-countries. Then it could be examined whether institutional differences between the

countries have effect on the choice to apply fair value accounting or not. In this study, the countries were chosen based on their similar accounting standards concerning PPE and investment property. For example the Czech Republic and Slovakia have very different accounting rules for these two asset groups compared to the sample countries. For this reason it would be interesting to focus on the differences between CEE-countries.

Last, there are no well-known international studies focusing on the changes in accounting policies after the IFRS adoption in the countries under research. Christensen and Nikolaev (2013) observed that several British companies that used fair value for at least one asset class in PPE under UK GAAP switched to historical cost for all asset classes upon the IFRS adoption. Therefore, exploring whether this switch applies to companies that come from the CEE-countries under research could be an intriguing topic and definitely worth studying.

7. References

Aboody, D., Barth, M. E., & Kasznik, R. 1999. Revaluations of fixed assets and future firm performance: Evidence from the UK. *Journal of Accounting and Economics*, 26 (1-3), 149-178.

Allen, F., & Carletti, E. 2008. Mark-to-market accounting and liquidity pricing. *Journal of Accounting and Economics*, 45 (2-3), 358-378.

Barlev, B., Fried, D., Haddad, J. R., & Livnat, J. 2007. Reevaluation of Revaluations: A Cross-Country Examination of the Motives and Effects on Future Performance. *Journal of Business Finance and Accounting*, 34 (7-8), 1025-1050.

Barth, M. E., & Clinch, G. 1998. Revalued financial, tangible, and intangible assets, association with share prices and non-market-based value estimates. *Journal of Accounting Research*, 36 (3), 199-233.

Cairns, D., Massoudi D., Taplin, R., & Tarca, A. 2011. IFRS Fair Value Measurement and Accounting Policy Choice in the United Kingdom and Australia. *British Accounting Review*, 43 (1), 1-21.

CFA. 2010. March 2008 Survey. Summary of CFA Institute Member Surveys September 2010. Available from (7-1-14): http://www.cfainstitute.org/ethics/Documents/survey_summary_for_fasb.pdf

Christensen, H. B., & Nikolaev, V. 2013. Does Fair Value Accounting for Non-Financial Assets Pass the Market Test? *Review of Accounting Studies*, 18 (3), 734-775.

Cotter, J., & Zimmer, I. 1999. Why do some firms recognize whereas others only disclose asset revaluations? Social Science Research Network (SSRN), Electronic Library, Working Paper Series.

Danbolt, J., & Rees, W. 2008. An experiment in fair value accounting: UK investment vehicles. *European Accounting Review*, 17 (2), 271-303.

Easton, P. D., Eddey, P. H., & Harris, T. S. 1993. An investigation of revaluations of tangible long-lived assets. *Journal of Accounting Research*, 31 (3), 1-38.

Ernst & Young. 2005. How fair is fair value? IFRS Stakeholder Series. Available from (7-1-14):
https://www2.eycom.ch/publications/items/ifrs/single/200506_fair_value/en.pdf

Fabricant, S. 1936. Revaluations of fixed assets, 1925-1934*. National Bureau of Economic Research Bulletin 62*. Available from (7-1-2014):
http://www.nber.org/chapters/c4318.pdf

Gaeremynck, A., & Veugelers, R. 1999. The revaluation of assets as a signalling device: a theoretical and an empirical analysis. *Accounting and Business Research*, 29 (2), 123-138.

Henderson, S., & Goodwin, J. 1992. The case against asset revaluations. *Abacus*, 28 (1), 75-87.

Herrmann, D., Saudagaran, S. M., & Thomas, W. B. 2006. The quality of fair value measures for property, plant, and equipment. *Accounting Forum*, 30 (1), 43-59.

Johnson, L. T. 2005. Relevance and reliability. The FASB Report. Available from (7-1-2014):
http://www.fasb.org/articles&reports/relevance_and_reliability_tfr_feb_2005.pdf

Kinnunen, J. 2009. Theories of financial statements – course lectures (=original source for figure 1). Helsinki School of Economics. Figure 1 is based on figure 2 (page 26) in Sailas, A. (2009) "Käypä arvo aineellisten käyttöomaisuushyödykkeiden ja sijoituskiinteistöjen arvostuksessa - empiirinen tutkimus pohjoismaisilla listatuilla yhtiöillä". Master's thesis / Helsinki School of Economics.

Krumwiede, T. 2008. Why Historical Cost Accounting Makes Sense. *Strategic Finance*, 90 (2), 33-39.

Lin, Y. N., & Peasnell, K. V. 2000. Fixed asset revaluation and equity depletion in the UK. *Journal of Business Finance and Accounting*, 27 (3-4), 359-394.

Muller, K. A. III, Riedl, E. J., & Sellhorn, T. 2008. Causes and consequences of choosing historical cost versus fair value. Pennsylvania State University, Harvard Business School, Ruhr Universitat-Bochum.

Muller, K. A. III, Riedl, E. J., & Sellhorn, T. 2011. Mandatory fair value accounting and information asymmetry: Evidence from the European Real Estate Industry. *Management Science*, 57 (6), 1138-1153.

Plantin, G., Sapra, H., & Shin, H. S. 2008. Marking-to-market: Panacea or Pandora's box? *Journal of Accounting Research*, 46 (2), 435-460.

PriceWaterhouseCoopers (PWC). 2013. IFRS adoption by country. PWC survey conducted in April 2013. Available from (4-17-2014):
http://www.pwc.com/en_US/us/issues/ifrs-reporting/publications/assets/pwc-ifrs-by-country-apr-2013.pdf

Ronen, J. 2008. To Fair Value or Not to Fair Value: A Broader Perspective. *Abacus*, 44 (2), 181-208.

Schipper, K. 2005. The introduction of International Accounting Standards in Europe: Implications for international convergence. *European accounting review*, 14 (1), 101-126.

Sharpe, I. G., & Walker, R. G. 1975. Asset revaluations and stock market prices. *Journal of accounting research*, 13 (2), 293-310.

Watts, R. L. 2006. What has the Invisible Hand Achieved? *Accounting and Business Research*, 36 (Special Issue, Supplement 1), 51-61.

Whittington, G. 2008. Fair Value and the IASB/FASB Conceptual Framework Project: An Alternative View. *Abacus*, 44 (2), 139-168.

List of cited accounting standards and accounting acts

Estonian GAAP. [Available from (7-23-2014): http://www.easb.ee/index.php?id=1976]

International Financial Reporting Standards (IFRS) & International Accounting Standards (IAS). [Available from (4-13-2014): www.ifrs.org]

Latvian GAAP (Annual Accounts Law). [Available from (4-13-2014): http://www.fm.gov.lv/files/files/Annual_Accounts_Law.pdf]

Lithuanian GAAP (Business Accounting Standards). [Available from (4-13-2014): http://www.aat.lt/index.php?id=85]

Polish GAAP (The Accounting Act of 29 September 1994). [Available from (4-13-2014): http://polishtax.com/wp-content/uploads/2012/01/Polish-Accounting-Act.pdf]

Slovenian Accounting Standards (SAS). [Available from (4-16-2014, in Slovenian only): http://www.uradni-list.si/1/objava.jsp?urlid=2005118&stevilka=5299]

Appendices

Appendix 1: Sample selection process

Appendix 1 presents the sample selection process. The process starts with all the companies that are classified as IFRS compliant and are domiciled in the chosen countries according to Thomson Reuters' Worldscope database. Next, I rule out companies that do not prepare their annual reports according to IFRS in practice. This group of companies includes five Latvian firms that are listed on the OMX Baltic secondary list and one Polish firm that is part of a German group that reports under German GAAP. Last, I deduct all the companies for which I cannot identify an IFRS annual report in English.

Active companies classified as compliant with IFRS and domiciled in the sample countries	531
Companies that did not prepare an IFRS annual report in 2010 or 2011	-6
IFRS companies domiciled in the sample countries	**525**
Companies for which I cannot identify an IFRS annual report in English for 2010 or 2011	-291
Total sample	**234**

Appendix 2: Examples of accounting policies

Appendix 2 presents two examples of applied accounting policies by the sample companies. Panel A demonstrates an example of a company that applies fair value accounting to both PPE and investment property and panel B presents a firm that applies historical cost to both PPE and investment property.

Panel A: A company that applies fair value to both PPE and investment property

Annual report according to IFRS for 2010

AS Tallink Grupp

Note 3.4 Property, plant and equipment (Recognition and measurement, page 41)

Property, plant and equipment, except ships, are measured at cost, less accumulated depreciation and impairment.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour and any other cost directly attributable to bringing the assets to a working condition for their intended use.

When part of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Ships are measured at fair value (i.e. revalued amounts) less depreciation charged subsequent to the date of the revaluation. Revaluation is normally performed every 3 to 5 years to ensure that the fair value of a revalued asset does not differ materially from its carrying amount.

At the revaluation date, the carrying amount of ships is replaced with their fair value at the date of revaluation and accumulated depreciation is eliminated. Any revaluation

surplus is recognised in other comprehensive income and presented in revaluation reserve in equity. A revaluation deficit is recognised in loss, except that a deficit offsetting a previous surplus on the same asset, previously recognised in other comprehensive income, is offset against the surplus in the "revaluation of ships".

An annual transfer from the revaluation reserve to retained earnings is made for the difference between depreciation based on the revalued carrying amount of the assets and the depreciation based on the assets' original cost. Upon disposal, any revaluation reserve relating to the particular asset being sold is transferred to retained earnings.

Note 3.7 Investment property (page 44)

Investment property is property held either to earn rental income or for capital appreciation or for both, rather than for sale in the ordinary course of business, use in the production or supply of goods or services, or for administrative purposes. Investment property is measured at fair value with any changes therein recognised in profit or loss.

When the use of a property changes such that it is reclassified to property, plant and equipment, its fair value at the date of reclassification becomes its deemed cost for subsequent accounting.

Panel B: A company that applies historical cost to both PPE and investment property

Annual report according to IFRS for 2010

The Budimex Group

Note 2.4 Property, plant and equipment (page 17)

Tangible fixed assets are stated at cost or cost of production less accumulated depreciation and impairment losses. Land and perpetual usufruct are stated at acquisition cost less impairment losses.

Tangible fixed assets, except for land, are depreciated using the straight line method in order to spread their initial cost reduced by the residual value, over the period of their estimated useful lives. Depreciation starts when the given item of tangible fixed assets is available for use. The depreciation periods are as follows:

• Buildings and constructions 10 – 50 years
• Plant and machinery 2 – 25 years
• Motor vehicles 3 – 10 years
• Other 2 – 10 years

Any subsequent expenditure is included in the carrying amount of the given fixed asset or as a separate item provided that it is probable that an inflow of economic benefits will flow to the Group and the cost of the given item may be reliably measured. Other costs incurred since the initial recognition such as costs of repair, maintenance or operating fees affect the financial result for the reporting period in which they were incurred, except for the significant costs of overhauls which are recognized in the carrying amount of the appropriate item of tangible fixed assets.

Verification of assets recoverable value and useful lives is performed at least once a year and, if necessary, their values are adjusted.

Where the carrying amount of the given tangible fixed asset exceeds its estimated recoverable value, the carrying amount is immediately reduced to asset recoverable value.

Gains and losses on disposal of tangible fixed assets are determined by way of comparing sale proceeds with assets carrying amounts and are recognized in the profit and loss account.

Construction in progress (Assets under construction)
Construction in progress is stated at the amount of aggregate costs directly attributable to the acquisition or production of such assets, including finance costs, less any

impairment losses. Construction in progress is not depreciated until completed and brought into use.

2.5 Investment property (page 17)

Investments in property (investment property) are initially valued at acquisition cost, after including transaction costs. After initial recognition, investment property, except for land, is depreciated on a straight-line basis over its estimated useful life and adjusted for impairment losses.

The useful lives of investments in property are as follows:

• Buildings and constructions 10 – 50 years
• Other investment properties 2 – 10 years

Appendix 3: Accounting under IFRS in sample countries

This appendix presents how the number of companies included in the study is distributed between different countries. Appendix 3 also reflects how companies account for PPE and investment property under IFRS in each country. HC means historical cost and FV equals to fair value, respectively.

Panel A: Company distribution by country

	Total sample		PPE		Investment property	
Country	No of firms	%	No of firms	%	No of firms	%
Estonia	16	7 %	15	6 %	13	10 %
Latvia	12	5 %	12	5 %	4	3 %
Lithuania	36	15 %	36	15 %	15	12 %
Poland	149	64 %	149	64 %	79	62 %
Slovenia	21	9 %	21	9 %	16	13 %
TOTAL	**234**	**100 %**	**233**	**100 %**	**127**	**100 %**

Panel B: Accounting under IFRS in sample countries

	PPE			Investment property		
Country	HC	FV	Total	HC	FV	Total
Estonia	13	2	15	5	8	13
Latvia	7	5	12	1	3	4
Lithuania	26	10	36	10	5	15
Poland	134	15	149	43	36	79
Slovenia	16	5	21	12	4	16
TOTAL	**196**	**37**	**233**	**71**	**56**	**127**