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Accounting and Apartment Prices

Evidence from the Swedish housing market

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Abstract

Prices in the Swedish housing market have developed considerably faster than Swedish GDP in recent years, resulting in increased leverage among apartment buyers and a higher financial risk in the Swedish economy. Furthermore, from the financial reporting year starting in 2014, Swedish non-listed entities were mandatorily required to adopt one of the K-frameworks. Using a sample of the 100 largest tenant-owner associations (TOAs) in Sweden adopting the K3-framework, we analyze (1) the potential effects on financial reporting quality and financial reporting harmonization following the implementation of the K3-framework and (2) how the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments. We find that general voluntary disclosure has increased following K3 adoption. Furthermore, we find that the disclosure related to TOAs' depreciation of parts method decreased at the time of K3 adoption, while the harmonization related to depreciation of parts increased over time. We conclude that financial reporting quality and harmonization has improved following K3 adoption. Looking at the valuation of tenant-owned apartments, we find that apartment-buyers are not using unfiltered information to a full extent. Our results suggest that financial performance has a statistically significant, but low, impact while TOAs' net debt is not fully reflected in apartment prices.

Key words: K3-framework, tenant-owner associations, apartment prices, usage of accounting information, financial reporting quality

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List of abbreviations

BFL	Book-Keeping Act
BFN	Swedish Accounting Standards Board
BoD	Board of Directors
DCF	Discounted cash flow
EU	European Union
FAR	Swedish Association of Chartered Accountants
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
NPO	Nonprofit organization
RFR	Swedish Financial Reporting Board
SABO	Swedish Association of Public Housing Companies
SBC	Sveriges BostadsrättsCentrum
SCB	Statistics Sweden
SMEs	Small- and medium-sized enterprises
SOU	State Public Investigation
Sqm	Square meter
TOA	Tenant-owner association
WACC	Weighted average cost of capital
ÅRL	Annual Accounts Act

Glossary

Annual Accounts Act	Årsredovisningslagen
Association fee	Bostadsrättsavgift
Book-Keeping Act	Bokföringslagen
Depreciation of parts	Komponentavskrivning
Economic association	Ekonomisk förening
Extended maintenance concept	Utvidgade reparationsbegreppet
Financial administrator	Ekonomisk förvaltare
Genuine tenant-owner association	Äkta bostadsrättsförening
Good accounting practice	God redovisningssed
Non-genuine tenant-owner association	Oäkta bostadsrättsförening
State Public Investigation	Statens Offentliga Utredningar
Statement of opinion	Remissvar
Statistics Sweden	Statistiska Centralbyrån
Subsequent enhancement principle	Prestandahöjande ansatsen
Swedish Accounting Standards Board	Bokföringsnämnden
Swedish Association of Public Housing Companies	Sveriges Allmännyttiga Bostadsföretag
Swedish Central Bank	Riksbanken
Swedish Companies Registrations Office	Bolagsverket
Swedish Financial Reporting Board	Rådet för Finansiell Rapportering
Swedish Financial Supervisory Authority	Finansinspektionen
Swedish Ministry of Finance	Finansdepartementet
Tenant-owned apartment	Bostadsrätt
Tenant-owner	Bostadsrättsägare
Tenant-owner association	Bostadsrättsförening

1. Introduction

Since 2005, prices in the Swedish housing market have tripled (Valueguard 2018), outgrowing Swedish GDP by twelve times. This has resulted in higher amounts of debt required for buyers in the housing market. The high debt levels have not yet had a substantial impact on the Swedish economy due to the low-interest rate environment in recent years. However, the increasing financial risk is a topic intensely debated in media and has resulted in the Swedish Financial Supervisory Authority proposed a mandatory mortgage repayment requirement in 2016 (Swedish Financial Supervisory Authority 2016), that became stricter in 2018 (Swedish Financial Supervisory Authority 2017). While an increased focus has been on the financial stability of individuals, the topic regarding the financial performance and position of Swedish tenant-owner associations (TOAs) has only recently come under scrutiny. According to a report from Sveriges BostadsrättsCentrum (SBC) (2018, p. 3), only 11% of Swedish tenant-owners said they had a good knowledge of their TOA's financials, while 87% were not worried about their TOA's financials. Additionally, as of March 2018, the total amount of debt lent out to tenant-owners and TOAs amounted to 1.5 trillion SEK, corresponding to 25% of the total lending volume (SCB Statistikdatabasen 2018a). A question therefore arises if it is possible that people can put such little emphasis on their TOA's financial performance and position, given that buying and owning an apartment represents one of the largest investments during their lifetime.

In addition to the attention of increasing apartment prices and debt levels, the debate concerning TOAs' accounting practices has intensified in recent years. In 2014, TOAs and all other non-listed Swedish entities were mandatorily required to adopt one of the K-frameworks prepared by the Swedish Accounting Standards Board (BFN). The K-frameworks were an attempt by BFN to structure the historically complex Swedish GAAP and improve comparability between entities (SBC 2018, BFN 2017). While old Swedish GAAP was unstructured and allowed for various options in accounting treatment, particularly for smaller entities, the K-frameworks require entities to conform to a specific set of standards. However, while K-framework adoption was mandatory, many smaller entities (including TOAs) had a voluntary choice between adopting the rules-based, Swedish tax-harmonized K2-framework and the principles-based, IFRS for SMEs-derived K3-framework. The K3-framework received widespread criticism (Castellum 2010, FAR 2010) mainly for its requirement of a new depreciation

method, depreciation of parts. However, supporters claim that asset values under the depreciation of parts method more closely resemble true economic values (Hellman et al. 2011). The impact of TOAs' financial performance and position, as well as the change in accounting methods, became the subject of a Swedish State public investigation (SOU), with the purpose to investigate the need for strengthened consumer-protection in the Swedish housing market (SOU 2017).

Previous research has documented widespread criticism of the IFRS for SMEs-framework due to increased complexity, administrative burden and that the main users of accounting information are not investors, but banks and tax authorities (Perera, Chand 2015, Quagli, Paoloni 2012). On the other hand, adoption of an IFRS-based framework is documented to have positive effects on both accounting quality (Barth et al. 2008) and disclosure quality (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006). Previous research regarding cross-country accounting harmonization following IFRS adoption have seen mixed results (Cascino, Gassen 2015, Barth et al. 2012, Brüggemann, Hitz & Sellhorn 2013, Liao, Sellhorn & Skaife 2012, Yip, Young 2012) while research regarding within-country harmonization has seen positive effects (Jones, Finley 2011). Thus, we wish to examine the effects on accounting when a voluntary accounting policy choice is made to transition from national GAAP to an IFRS for SMEs-derived framework, in a setting where the main users of accounting information are investors. In our case, the investors are apartment buyers.

Finally, we wish to examine the link between TOAs' financial information and apartment prices. In theory, the financial performance and position of TOAs should affect the pricing of their tenant-owned apartments. However, previous research suggests that non-professional private investors do not use information directly from financial statements (Elliott et al. 2008). If such ignorance of financial information exists in the market for tenant-owned apartments, the total risk in the Swedish economy would be severe.

The purpose of this thesis is therefore to (1) analyze the potential effects on financial reporting quality and financial reporting harmonization following TOAs' adoption of the K3-framework and (2) examine how the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments. As a result, we aim to answer the following research question:

"What effect did the K3 adoption have on accounting among Swedish TOAs, and how are TOAs' financial information reflected in the pricing of tenant-owned apartments?"

Our sample consists of the 100 largest TOAs who have voluntarily chosen to adopt the K3-framework. We argue that these TOAs' voluntary transition to K3 in combination with their size, amount of apartment transactions occurring within them and large property values under management would indicate a high ambition in terms of accounting practices and transparency. Thus, our sample allows us to examine the K3-implementation in an optimal setting. Furthermore, the ambition and transparency of the TOAs in our sample should facilitate the usage of financial information for apartment buyers. As such, this should create a setting where the link between TOAs' financial information and their tenant-owned apartment prices is the strongest.

We contribute to previous research in several aspects. First, by being able to study the implementation of the IFRS for SMEs-derived K3-framework in a setting where the main users are investors. Our findings regarding an improvement in financial reporting of TOAs following K3 adoption indicate that the benefits of an IFRS for SMEs-derived framework are substantial. Second, we contribute to previous literature regarding the voluntary transition from national GAAP to IFRS-based standards in an IFRS for SMEs-setting, where we find an improvement in financial reporting quality and harmonization following K3 adoption. Third, we propose a fundamental valuation model for valuing tenant-owned apartments. Finally, in line with previous theory regarding private investors' usage of filtered information, we contribute to previous literature within this field by documenting a lack of usage of unfiltered information among non-professional private investors, who in our case are apartment buyers.

Our thesis also aims to have a more general contribution to the ongoing debate of the Swedish housing market for TOAs and tenant-owned apartments. Given the considerable values and debt levels within Swedish TOAs and tenant-owned apartments, their potential impact on the Swedish economy is substantial. Thus, we believe there is a need to thoroughly investigate the accounting, financial performance and position of TOAs. Furthermore, we aim to contribute to SOU's efforts in this area by elaborating on the development of TOAs' accounting information, its effect on the Swedish housing market and, if financial information matters to apartment buyers.

2. Empirical background

Section 2.1 will present characteristics of the Swedish housing market and why TOAs represent a domain with unique attributes. Section 2.2 provides an empirical background of Swedish accounting regulations and practices, with a specific focus on the Swedish K3-framework. The focus on Swedish TOAs is further elaborated on by presenting a model for valuing tenant-owned apartments in section 2.3. Finally, in 2.4, recent Swedish governmental action and proposed legislative changes are presented.

2.1 The Swedish housing market

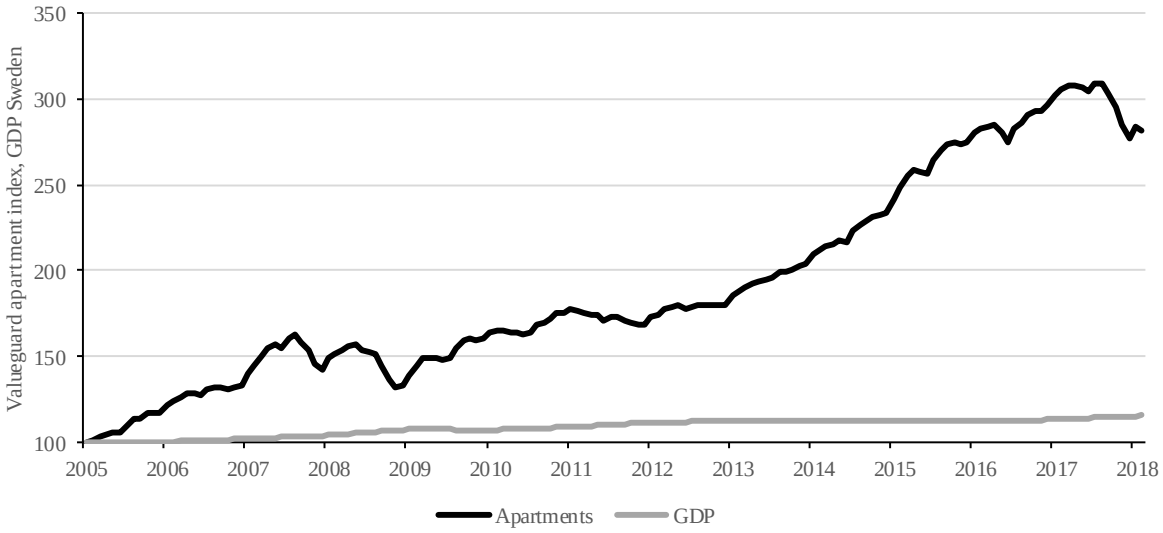
In Sweden, the total housing stock consists of 4.8 million housing units[1], of which 1.8 million are rentals, 1.9 million fully-owned houses and 1.1 million tenant-owned apartments. Tenant-owned apartments thereby constitute 23% of the total housing stock in Sweden. These tenant-owned apartments are in turn distributed over approximately 29,000 TOAs, of which 25,000 are active (SOU 2017, p. 80). Among the 500 largest TOAs, most were formed by HSB or Riksbyggen, two large Swedish economic associations, in the 1960-1970s, and on average consist of 363 apartments (SOU 2017, p. 80). Over time, TOAs have gone from being converted from rental apartments by a group of private individuals, to projects created by larger national associations such as HSB and Riksbyggen, or by residential developers.

In general, tenant-owned apartments and the more internationally prevalent condominiums are fairly similar. The main difference is that a condominium is fully owned by the household, whereas a tenant-owned apartment is owned by the TOA. While the household is not the de facto owner of the tenant-owned apartment itself, the share of the TOA gives the member the exclusive right to use the acquired apartment. Like condominiums, tenant-owned apartments are traded on the open market. In recent years, prices have increased at a considerably higher rate than Swedish GDP, as seen in figure 1. In terms of responsibilities, tenant-owned apartments fall between rental apartments and condominiums concerning rights to a personal asset and influence over decisions related to the property containing the apartments. In a simplified way, the tenant-owner is responsible for interior maintenance of the apartment, and

[1] As of 2016 (SCB Statistikdatabasen 2017)

the association is responsible for exterior maintenance (SOU 2017, p. 90). Additionally, the tenant-owner is required to pay a stipulated annual association fee in order to finance the TOA's current and future expenditures.

Figure 1 – Price development of Swedish apartments and Swedish GDP development



2.1.1 Tenant-owner associations (TOAs)

A TOA is an economic association, whose purpose is to grant the right to use apartments and/or houses under the association's ownership (Bostadsrättslag (BRL) 1991, chapter 1 §1). According to Swedish law, an association is required to have at least three members, approved bylaws, a board of directors (BoD) and at least one auditor (SOU 2017, p. 124). While TOAs are often themselves members of larger economic associations, such as HSB or Riksbyggen (SOU 2017, p. 80), the final responsibility regarding day-to-day operations and preparing the financial statements resides with the TOA. TOAs can however receive advice and support regarding accounting matters from hired financial administrators or other experts. TOAs' main purpose is not to be a for-profit entity, therefore, the association fees paid by the tenant-owners are intended to, in the long run, match current and future expenditures. TOAs can be classified as either genuine or non-genuine, in accordance with Swedish tax regulation. To be classified as a genuine TOA, 60% or more of the association's income must originate from association fees paid by the members (Inkomstskattelag (IL) 1999, chapter 2 §17). Should the ratio fall below 60%, the tenant-owners of the non-genuine association are subject to additional personal taxes, since it is considered that the influence of for-profit operations is substantial.

2.2 Swedish GAAP and the K-frameworks

The two Swedish accounting laws, the Book-Keeping Act (BFL) and the Annual Accounts Act (ÅRL), are intended to act as a framework legislation where only fundamental principles and minimum requirements for accounting are directly regulated by law. Instead, the legislator's intention was to let Swedish 'good accounting practice' be determined by standards and norms (SOU 2014, pp. 178-180). The primary standard setters in Sweden are BFN and the Swedish Financial Reporting Board (RFR). Unlike international private standard setters, such as the IASB, BFN is a governmental body under the Swedish Ministry of Finance, and acts as the Swedish Government's expert in court regarding accounting issues. RFR on the other hand is a private standard setter and issues standards specifically for listed entities (RFR 2018), while BFN addresses non-listed entities.

In 2004, BFN began developing new standards for Swedish entities, the K-frameworks. Prior to the K-frameworks, BFN released separate standards for targeted sections of Swedish accounting law, which included simplifications for smaller entities. However, smaller entities often had the ability to choose between simplified and more advanced principles, which in practice allowed the entities to affect the financial results through accounting choices. Thus, there was a possibility to create specific effects and treat transactions in a way that did not reflect the true economic substance of a transaction (BFN 2017).

The leeway of Swedish accounting standards therefore obstructed comparability between non-listed entities, leaving information difficult to interpret. The K-frameworks (K1-K4) intended to address this issue, by creating comprehensive frameworks for groups of entities, based on their size. In 2012, BFN introduced the K3-framework, intended to become the main framework for non-listed entities. Prior to 2014, entities still had a choice between adopting a K-framework or old Swedish GAAP. As of 2014, adopting one of the K-frameworks became mandatory (BFNAR 2012:1). Even though K-framework adoption became mandatory, smaller entities were allowed to make a voluntary accounting choice between adopting either K2 or K3.

K1 and K2 are rules-based frameworks intended for smaller entities, that have simplified rules, a high harmonization with Swedish tax accounting and largely involves the use of cash accounting (BFNAR 2016:10, p. 11). The K4-framework is the classification for listed entities

applying IFRS. The K1-framework can only be adopted by entities with annual revenue below SEK 3m and is mainly intended for NPOs and registered religious communities (BFNAR 2006:1, BFNAR 2010:1). K2 is a rules-based framework and designed in such a manner that it is often directly stated how an entity should account for a transaction. For example, entities applying K2 are not allowed to capitalize internally generated intangible assets (BFNAR 2016:10, chapter 10 §4). Furthermore, K2 allows for capitalization of improvements of a tangible asset only if the undertaken actions materially change the usage of the original asset (BFNAR 2016:10, pp. 171-172). For the K2-framework to be applicable, the entity has to be classified as 'smaller' according to criteria presented in the ÅRL (Årsredovisningslag (ÅRL) 1995, chapter 1 §3). The criteria are that (1) revenue should not exceed SEK 80m, (2) the entity should have less than 50 full-time employees and (3) total assets should not exceed SEK 40m. If the entity breaches more than one of the criteria in each of the last two fiscal years, K3 must be applied. It is clear, that these criteria are not primarily addressing TOAs, given that TOAs rarely have several full-time employees or large amounts of revenue. However, most TOAs manage asset values considerably higher than SEK 40m.

2.2.1 The K3-framework

Unlike K1 and K2, the K3-framework is a principles-based framework and heavily influenced by IFRS for SMEs (BFNAR 2012:1, p. 10). However, BFN made certain adjustments to IFRS for SMEs when constructing the K3-framework. Hence, the K3-framework is a standalone framework. The differences between K3 and IFRS for SMEs mainly relate to K3 being developed within the existing boundaries of ÅRL, as well as the close affiliation between Swedish GAAP and Swedish tax accounting (BFNAR 2012:1, p. 10). An example of the boundaries set by ÅRL in the K3-framework includes the distinction between 'smaller' and 'larger' entities. As such, smaller entities voluntarily adopting K3 have several exceptions. For example, smaller entities are not required by ÅRL to include a cash flow statement nor restate previous financial information when changing accounting principles, such as going from old Swedish GAAP to K3 (BFNAR 2012:1, p. 261).

One of the most essential changes in the K3-framework from old Swedish GAAP involves the implementation of the depreciation of parts method for tangible assets, and the requirement to classify tangible assets into parts. In Sweden, prior to K3 adoption, the subsequent enhancement principle was used when determining whether subsequent expenditures related to

tangible assets should be expensed or capitalized. This was dependent on if the expenditure enhanced or maintained the asset in question (BFNAR 2001:3, §5.2). The method was based on the subsequent expenditure recognition principle in former IAS 16, which was later revised by the IASB in 2003 due to criticism of "*difficulties in practice in making the distinction it required between expenditures that maintain, and those that enhance an item of property, plant and equipment*" (IAS 16 2014, BC5). As such, Swedish entities had considerable leeway when deciding whether to capitalize or expense subsequent expenditures related to property, plant and equipment. Furthermore, the decision to immediately expense subsequent expenditures was influenced by old Swedish GAAP's close affiliation to Swedish tax accounting, where Swedish tax law had an extended maintenance concept that allowed for an extensive use of immediate expensing (Inkomstskattelag (IL) 1999, chapter 19 §2). The possibility for entities to have such leeway was also made possible by the documented low level of enforcement among non-listed entities (Marton 2017).

A real estate property can be used as an example to illustrate the differences between the two methods. Windows have a considerably shorter expected useful life than the foundation, yet are essential for the property as a whole in order to generate economic benefits for the owners. When the windows are depleted and replaced with newly acquired windows in order to keep the property providing economic benefits.

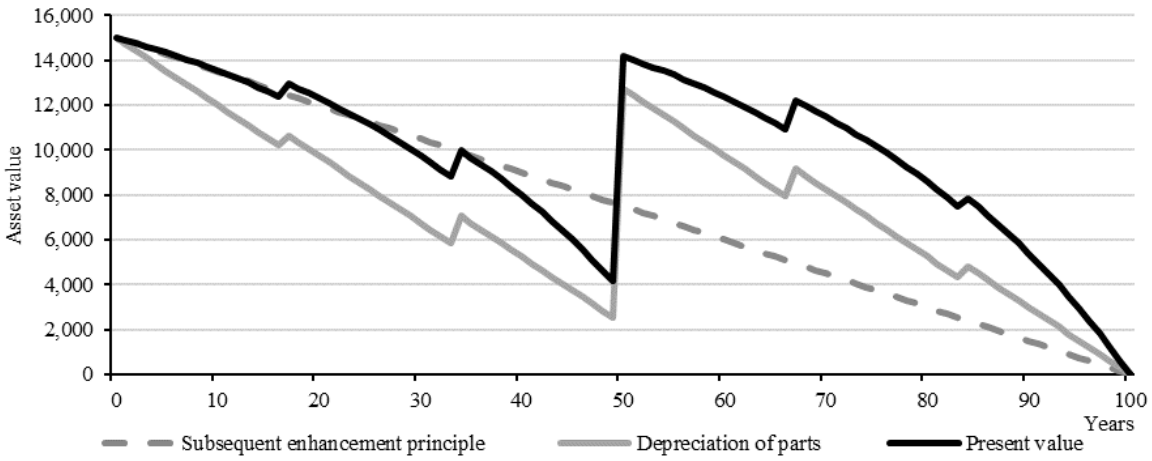
Using the subsequent enhancement principle under old Swedish GAAP, the economic lifetime of the entire asset would be equal to the lifetime of the parts with the longest lifetime (often the foundation). The acquisition of the windows would then, as long as it is not significantly enhancing the performance of the property, be expensed immediately. The old windows are according to accounting still part of the original asset, since the building is recognized as one item, and therefore still depreciated over the item's economic lifetime.

The other option, introduced in the K3-framework, would be to use depreciation of parts. According to the first criteria in IAS 16 §7a (2014), an asset should be recognized if *"it is probable that future economic benefits associated with the item will flow to the entity*". For an asset consisting of several parts, this definition becomes highly relevant. According to IAS 16 §13 (2014) and K3 (BFNAR 2012:1, pp. 151 & 154), the property should for accounting purposes be divided into parts where each part should be recognized and depreciated separately. When the new windows are acquired and recognized on the balance sheet, the old are

derecognized. The economic benefit associated with each specific part is often difficult to separate, but it is clear that the windows will, together with the other parts, generate economic benefits. The windows should therefore be recognized as an asset in accordance with IAS 16 §7a (2014). This intention is described by the standard setters in BC5 for IAS 16 Property, Plant and Equipment (2014, BC5).

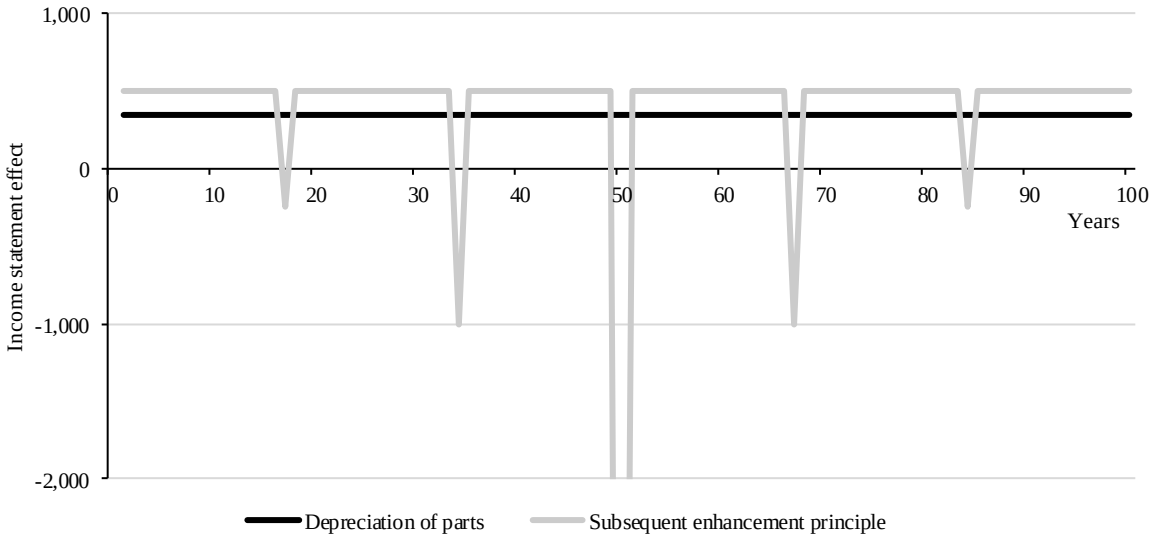
The requirement for depreciation of parts represents an aim to have property, plant and equipment more closely resemble their true economic values. This was supported by Hellman et al. (2011) who showed that the K3-framework's depreciation of parts method for properties was superior to the subsequent enhancement principle in terms of value relevance and their closer proximity to present value accounting. The K3-framework's aim of having asset values more closely resemble present values is also supported in theory, where Canning (1929) connected the theory of present value with accounting by showing that the value of an asset or liability should be the present value of all future cash flows related to that specific asset or liability. Furthermore, Hitz (2007) argued that present values would provide more correct values of the assets or liabilities to the user. As seen in figure 2 and 3[2], the depreciation of parts method represents a more comprehensive and relevant accounting method when taking into account both current asset values and their depletion over time. For specifications of the example, see Appendix A.

Figure 2 – Hellman et al. (2011) balance sheet effects under different accounting methods



[2] In figure 3, the income statement effect in year 50 using the subsequent enhancement principle is -10,000.

Figure 3 – Hellman et al. (2011) income statement effects between the subsequent enhancement principle and depreciation of parts



However, the depreciation of parts method was heavily criticized in the statements of opinions prior to the implementation of the framework. For example, the listed Swedish real estate company Castellum (2010) strongly opposed the proposal with the motivation that buildings are "*complex assets*" and it would therefore be costly to implement depreciation of parts. FAR (2010), the Swedish Association of Chartered Accountants, also criticized the proposal and asked for either exceptions for smaller entities, or to completely remove the depreciation of parts method from the K3-framework. To facilitate the interpretation of the new depreciation of parts method, the Swedish Association of Public Housing Companies (SABO) (2013) issued guidance for classification of parts.

2.3 A model for valuing tenant-owned apartments

The previous sections addressed the Swedish housing market, the Swedish accounting setting and how asset properties are accounted for using old Swedish GAAP and the K3-framework. In our setting, we argue that accounting information regarding TOAs' financial performance and position is not only relevant for internal assessment within each TOA. The accounting and financial information of TOAs are also of central importance from a market perspective, where we argue that TOAs' accounting information should be taken into consideration when valuing tenant-owned apartments.

The most common approach used by apartment buyers when evaluating apartment prices originates from comparing the apartment in question with precedent transactions. This is often based on a multiple approach, using 'price per square meter' for objects in the same region and of similar characteristics such as size, number of rooms and the overall quality of the apartment. However, this approach comes with a fundamental issue, since it does not take into account the financial performance and position of the TOA, of which the buyer is purchasing a share of the association.

We aim to connect TOAs' financial information to the valuation of their tenant-owned apartments. We take a fundamental valuation approach and provide a theoretical logic behind the connection between financial data and valuation. One valuation model often used in practice is the discounted cash flow model (DCF) (Koller, Goedhart 2015). In this model, the enterprise value is based on the present value of all future free cash flows discounted by the weighted average cost of capital[3] (WACC), as illustrated in formula 1.

$$EV_0 = \frac{FCF_1}{(1+WACC)^1} + \frac{FCF_2}{(1+WACC)^2} + \cdots + \frac{FCF_T}{(1+WACC)^T} = \sum_{t=1}^{T} \frac{FCF_t}{(1+WACC)^t} \qquad (1)$$

Where,

t: $time\ period$

EV_0: Enterprise value at time $t = 0$

FCF_t: Free cash flow at time t

$$WACC = \frac{MV(E)}{MV(E)+MV(ND)}\, r_e + \frac{MV(ND)}{MV(E)+MV(ND)}\, r_{ND}$$

$MV(E)$: Market value of equity

$MV(ND)$: Market value of net debt

r_e: cost of equity

r_{ND}: cost of net debt

However, valuing a tenant-owned apartment adds complexity compared to valuing listed entities since there are only negative cash flows associated with the apartment during the holding period (a tenant-owner buys an apartment and thereafter pays monthly association fees). In most other cases, no rational investor would invest in an asset that only represents

[3] Assuming no tax since tenant-owner associations are not subject to corporate taxes

future negative cash flows. However, for buying a housing arrangement, it still makes sense to pay regular cash flows during the holding period.

We propose a valuation model based on the economic differences between apartment owners and apartment lessees. We argue that the value of the tenant-owned apartment could be based on what the alternative cost would be for a tenant-owner of renting, instead of owning, an apartment identical to the tenant-owned apartment in an efficient market. This since living in an apartment can be classified into a binary decision, to either own or rent, as there is no other alternative once the choice is made to live in an apartment. Our theoretical model uses a valuation approach where all factors are expressed per square meter. The rental expense per square meter ($R_{Renting}$) of a rental apartment is the amount the tenant-owner will save by owning an identical apartment. The rental expense could therefore be seen as an implied positive cash flow for the tenant-owner. In an efficient market, the rental expense would be based on the price-equilibrium (supply and demand) and affected by factors such as the size, story and general quality of the apartment. This since these factors are believed to affect the attractiveness and demand for the apartment in question.

The alternative cost approach should not only consider the implied positive cash flows, but also the actual negative cash flows associated with owning an apartment. These include the tenant-owner's share of operating expenses per square meter ($OPEX$) and investment needs for the TOA. Operating expenses could include costs such as cleaning of common areas, repairs, maintenance (not capitalized) and administration. Given that TOAs' long-run economic purpose should be to break-even, the association fee charged should therefore in theory match both current and future expenditures of the TOA. On a year-to-year basis though, net income per square meter (NI) could deviate from break-even levels. In such a case, positive (negative) net income should reduce (increase) the negative cash flows. In the long-run, we would also expect that the TOAs' capital expenditures per square meter ($CAPEX$), should equal depreciation per square meter (Dep). Changes in net working capital (ΔNWC) will also affect the free cash flows. An increase in net working capital will increase the negative cash flows. Furthermore, any additional sources of revenue per square meter ($Other\ revenue$) besides association fees, such as income from rental apartments owned by the TOA, are expected to yield positive cash flows for tenant-owners. In accordance with the DCF-approach, the expenditures of a TOA should only be related to the TOA's operating activities (Koller,

Goedhart 2015, p. 133), and not be influenced by financing decisions and net interest expenses paid per square meter (I), since we are using a valuation model based on enterprise value. As a result, we can estimate the cash flows per square meter related to the tenant-owned apartment as:

$$CF_{Owning_t} = OPEX_t - Dep_t - NI_t - Other\ revenue_t + CAPEX_t + \Delta NWC_t \quad (2)$$

Where,

CF_{Owning_t}: Cash flow per sqm related to tenant owned apartment at time t

$OPEX_t = AF_t - I_t$

AF_t: Association fees per sqm at time t

I_t: TOAs′net interest expenses paid per sqm at time t

$CAPEX_t$: TOAs′ capital expenditures per sqm at time t

Dep_t: TOAs′depreciation expenses per sqm at time t

NI_t: TOAs′ net income per sqm at time t

$\Delta NWC_t = NWC_t - NWC_{t-1}$

NWC_t: Net working capital at time t

$Other\ revenue_t$: TOAs′ other revenue per sqm at time t

In each period, the total alternative free cash flows related to a tenant-owned apartment can be calculated as:

$$AFCF_t = R_{Renting_t} - CF_{Owning_t} \quad (3)$$

Where,

$R_{Renting_t}$: Rental expense per sqm at time t for renting an equivalent apartment

The enterprise value of a tenant-owned apartment per square meter can therefore be calculated as the present value of all future alternative free cash flows discounted by the weighted average cost of capital, as seen in formula 4.

$$EV_{sqm_o} = \sum_{t=1}^{T} \frac{AFCF_t}{(1+WACC)^t} \quad (4)$$

By applying the logic of enterprise valuation, we believe that the link between the financial performance and position of the TOA, the demand and supply for the tenant-owned apartment and the value of the apartment becomes more apparent. Note that the DCF-model values the

enterprise itself. In order to arrive at the equity value per square meter ($MV(E)_{sqm}$) of the tenant-owned apartment, the tenant-owner's share of the TOA's net debt[4] (ND_{sqm}) is deducted from the enterprise value, as seen in formula 5. An illustrative example of how to value a tenant-owned apartment using our theoretical valuation model is presented in Appendix B.

$$MV(E)_{sqm_o} = EV_{sqm_o} - ND_{sqm_0} \quad (5)$$

Where,

$MV(E)_{sqm_o}$: Market value per sqm of tenant owned apartment at time $t = 0$

ND_{sqm_o}: TOAs' net debt per sqm at time $t = 0$

In our thesis, we are studying the financial performance and position of TOAs, and not the dynamics of the rental market. Hence, we will control for the alternative income ($R_{Renting}$) by factors related to supply and demand (as the rental expense is assumed to be based on a price equilibrium), such as size, story and regional price levels. The emphasis in our study will therefore be on the actual negative cash flows (CF_{owning}). Furthermore, the aim of this thesis is not to theoretically calculate the correct apartment values, but to examine what fundamental financial factors of TOAs that may affect and explain apartment prices. Therefore, there is no need for us to take into account or elaborate further upon the discount rate. However, as the theoretical value of a tenant-owned apartment is directly linked to the tenant-owner's share of a TOA's net debt, we will easily be able to study the effect that net debt could have on apartment prices. For example, an increase in a TOA's net debt of 1,000 SEK/sqm should in theory reduce the value of a tenant-owned apartment by the same amount. The discount rate is not affecting this relationship.

2.4 Recent governmental action and proposed legislative changes

In 2015, the Swedish Government formed an SOU (2017) to investigate whether there is a need to strengthen consumer-protection in the Swedish housing market. The final report was presented in April 2017. One of the main proposals by SOU was that BFN should create specific guidance for TOAs, due to the lack of framework alignment for TOAs, the lack of harmonization between K2-TOAs and K3-TOAs as well as the exceptions within the ÅRL for

[4] Assuming that the book value of net debt is equal to market value

smaller entities. For example, smaller entities are not required to present a cash flow statement (SOU 2017, p. 152). Furthermore, SOU (2017, p. 110) criticized that TOAs were not required to disclose key performance indicators (KPIs) since it would facilitate an overview of the TOA in question. In order to further increase information and decision usefulness for consumers, SOU (2017, p. 154) proposed that it should be required for TOAs to present a cash flow statement as well as a selection of KPIs. In light of the depreciation of parts method in the K3-framework, SOU (2017, p. 20) proposed that all TOAs should use depreciation of parts, regardless of applied K-framework, in order to harmonize accounting and facilitate understanding for consumers.

3. Previous literature and theoretical development

In the following section, we aim to examine previous literature related to our research question, the effect of K3 adoption on accounting among Swedish TOAs and how financial information is reflected in the pricing of tenant-owned apartments. Given that the K3-framework is derived from IFRS for SMEs, we initially look at research related to this in section 3.1.1. We then look into the effects on financial reporting quality and accounting harmonization when transitioning from national GAAP to IFRS in section 3.1.2. For our study, it is also interesting to understand how usage of accounting information differs among user groups, which is examined in section 3.1.3. Finally, in section 3.2, we link previous literature to our empirical setting.

3.1 Previous literature

3.1.1 IFRS for SMEs

In 2009, the IASB developed IFRS for SMEs, a specific framework for small and medium-sized enterprises (SMEs), which contains reduced recognition and measurement principles, and disclosure requirements compared to the full IFRS (Perera, Chand 2015). The main objectives behind the framework were to give entities access to competitive multinational lending, financial reporting relaxation, reduced administrative burden, and to better serve the accounting information needs of users among SMEs (IFRS for SMEs 2015).

However, several studies have criticized the framework. Perera & Chand's (2015) findings included the risk of burdening SMEs with separate financial- and tax accounting due to differing national requirements, educational costs and inadequately addressing user information needs. Additionally, the authors found that inconsistencies of the "*true and fair view*" between IFRS for SMEs and full IFRS could exist in the same country due to different reporting requirements. Furthermore, the European Commission itself believed that the objectives of simplification and reduction of administrative burden for SMEs have not yet been addressed by IFRS for SMEs (Perera, Chand 2015). The criticism of inadequately addressing user information needs is further supported by Quagli & Paoloni (2012), where their study confirmed weak user participation and a lack of satisfying user information needs. In their study, Quagli & Paoloni (2012) argued that the problems related to IFRS for SMEs outweigh

the benefits, due to the main stakeholders being banks and tax authorities compared to investors for full IFRS.

Furthermore, research among SMEs also shows that other factors besides accounting policy choice could account for improvements in user information relevance. For example, SMEs disclose more information when they are likely to benefit from disclosure (Lardon, Deloof 2014). As such, SMEs could use other measures besides changing, or adhering to, accounting standards in order to improve user information relevance.

Despite the issues presented in previous research, more than 70 countries apply IFRS for SMEs, or have plans to adopt the standards in the near future (Kaya, Koch 2015). Kaya & Koch (2015) further supported the criticism presented above by finding IFRS for SMEs mainly being applied in developing non-EU countries. While IFRS for SMEs on a stand-alone basis has not been adopted to a large extent among EU countries, Gassen (2017) found that it has still significantly influenced private firms' financial reporting practices and transparency by serving as a blueprint for national regulatory reforms, such as the Swedish K3-framework (section 2.2.1). Thus, while a principles-based accounting framework remains advocated, criticism is documented regarding the IASB's attempt to align the IFRS framework with the needs of SMEs, and has resulted in countries instead using adapted national frameworks for SMEs.

3.1.2 Financial reporting quality and harmonization when transitioning from national GAAP to IFRS

In terms of accounting improvement, Barth et al. (2008) found that firms applying IAS generally exhibit an improvement in accounting quality between pre- and post-adoption periods. In particular, firms having adopted IAS generally evidence less earnings management, more timely loss recognition and more value relevance of accounting numbers than matched sample firms applying non-US domestic standards. However, if enforcement of IAS adoption and national accounting rules are lacking, this could result in IAS adoption actually lowering accounting quality (Barth et al. 2008). As such, the desired positive effects of IFRS can be argued to be linked to the level of enforcement (Ball 2006). Furthermore, research suggest that institutional factors also have an impact on IFRS adoption (Kvaal, Nobes 2012, Kvaal, Nobes 2010, Nobes 2013, Nobes 2011, Hellman et al. 2015). For example, Hellman et al. (2015) used IFRS as a common yardstick to compare national GAAP numbers during the countries'

mandatory IFRS adoption and reconciliation year. The authors found statistically significant differences in IFRS adoption between different international classification systems and institutional groups.

However, as Daske & Gebhardt (2006) pointed out, the assessment of accounting quality of IAS/IFRS compared to national GAAP often focuses on the relation between earnings and stock returns. In Daske & Gebhardt's (2006) study, they instead examined the quality of financial statements by comparing disclosure quality, arguing that "*none of the prior studies assess the quality of the financial reports by looking directly into the actual annual reports"* (Daske, Gebhardt 2006, p. 467). The disclosure score used was in turn based on 'best annual report' beauty contests. The authors found that the perceived disclosure quality has increased significantly following IFRS adoption, both for voluntary and mandatory adopters.

In support of Daske & Gebhardt (2006), De la Bruslerie & Gabteni (2014) found that, when testing voluntary disclosure using a self-constructed index, the introduction of IFRS enhanced the disclosure of voluntary information in a French setting. Voluntary disclosure is in turn defined as information not mandatorily required to be presented within financial reports (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006, Francis et al. 2008, Cooke 1989). Furthermore, Francis et al. (2008) applied a similar self-constructed voluntary disclosure index in order to examine earnings quality, and found that firms with good earnings quality also have a higher level of disclosure quality. To conclude, research would suggest that IFRS adoption has improved the quality of financial reporting, both in terms of accounting and voluntary disclosure.

One of the main intentions behind transitioning from national GAAP to IFRS-based standards revolves around cross-country harmonization (Brüggemann, Hitz & Sellhorn 2013, Liao et al. 2012, Yip, Young 2012), defined as the move away from diversity towards uniformity in accounting practices. Furthermore, harmonization can also be examined in a within-country setting (Jones, Finley 2011, Archer et al 1995, Aisbitt 2001).

The question whether cross-country comparability has increased following IFRS adoption has seen mixed results in previous literature (Cascino, Gassen 2015, Barth et al. 2012, Brüggemann et al. 2013, Liao et al. 2012, Yip, Young 2012). Taking a within-country perspective, previous studies have found a similar mix of results. Archer et al. (1995) found little within-country

harmonization of accounting policy choice, citing the presence of both GAAP and IAS applications within countries as an explanatory factor at the time of the study, while Aisbitt (2001) documented instances of both harmonization and de-harmonization of accounting treatments among Nordic countries between 1981 and 1998. Additionally, Aisbitt (2001) cited problems of reliability and validity of the test indexes, arguing that her results can only be fully understood in the contexts of the raw data. However, both of the abovementioned studies did not examine IFRS adoption, while Jones & Finley (2011) found support that within-country convergence of overall financial reporting diversity has occurred following IFRS adoption. Ball (2006) argued that that real convergence and harmonization is related to enforcement mechanisms.

3.1.3 Usage of accounting and financial information for valuation

Research would suggest that there are significant differences in the needs of accounting information among different capital providers, such as equity- and debt providers (Cascino et al. 2014). Cascino et al. (2014) presented an extensive overview of previous research within this area. For professional equity investors, financial reporting and interaction with management is used in order to make financial decisions (Holland 1998, Holland 1999). Within financial reporting, the income statement is the most used information (Cascino et al. 2014) while professional investors also use other information, such as the notes (Olbert 1994). The financial information is then used as a basis for valuation models (Barker 1998, Barker 1999, Imam et al. 2008), such as the DCF model, and was also supported in a Swedish setting by Olbert (1994).

Private/retail equity investors on the other hand rely on information from financial institutions (Cascino et al. 2014, Lee, Tweedie 1975) and public media (Cascino et al. 2014). Furthermore, Elliott et al. (2008) discovered differences within the group of private/retail equity investors, where more experienced investors use ‘unfiltered’ financial information to a greater extent. In this case, unfiltered information is defined as the underlying information not being selected, condensed and interpreted (Elliott et al. 2008, Cascino et al. 2014). Additionally, Elliott et al. (2008) showed that less experienced investors’ use of unfiltered information is linked to lower returns. This could to some extent be explained by Bhattacharya & Chiesa (1995), who found that retail investors tend to ignore relevant information, even if they are targeted.

3.2 Theoretical development using the Swedish housing market

3.2.1 K3 adoption

The first purpose of our thesis concerns the potential effects on financial reporting quality and financial reporting harmonization when transitioning from national GAAP to IFRS. To examine this, our setting revolves around TOAs' voluntary transition from old Swedish GAAP to the IFRS for SMEs-derived K3-framework.

One of the main critique brought forward by Quagli & Paoloni (2012) regarding IFRS for SMEs revolves around the argument that banks and tax authorities are the main users of accounting information among SMEs, while the IASB's intended users of the framework are investors. However, the main users of accounting and financial information within the landscape of TOAs should reasonably be the people buying apartments, i.e. investors, since there is an active market for trading the ownership of the rights to use apartments. The K3-framework could therefore in reality be more suited for TOAs than for 'regular' non-listed SMEs. This would contradict some of the critique brought forward by SOU (2017, p. 152), that the K3-framework is not customized for TOAs' unique attributes, and therefore makes the setting especially interesting to study. In turn, this would add another level to the discussion between IFRS and IFRS for SMEs in terms of their respective main users.

Furthermore, the criticism of IFRS for SMEs (Perera, Chand 2015, Quagli, Paoloni 2012) would suggest that the benefits of IFRS adoption, and by extension K3, are not as clear-cut. The criticism of IFRS for SMEs related to increased administrative burden, complexity and need for education among professionals (Perera, Chand 2015, Quagli, Paoloni 2012) would provide interesting insight into why TOAs choose to adopt K3. Especially given that TOAs had the voluntary choice to adopt the more 'simplified' K2-framework. The criticism of IFRS for SMEs is also extended to the K3-framework, by seeing a documented opposition from both Swedish standard setter FAR (2010) and the preparers, such as the real estate company Castellum (2010). Thus, a tension can be found which we deem to be of interest. More specifically, the tension between the benefits of adopting IFRS and the critique of IFRS for SMEs and K3, and why TOAs, despite their lack of professional accounting knowledge, adopt the IFRS-based K3-framework.

For the purpose of our thesis, the transition from old Swedish GAAP to the IFRS for SMEs-derived K3-framework provides an interesting setting in relation to previous studies regarding financial reporting quality and harmonization. Our sample consists of the 100 largest TOAs in Sweden adopting the K3-framework. Given that these TOAs have made a voluntary choice to adopt the K3-framework, we would argue that these TOAs are characterized by an ambition to be transparent, present relevant information and have a high level of financial reporting quality. This because of the large number of tenant-owners, apartment transactions occurring within them and the considerable assets under management. As such, an ambition to attract new tenant-owners and reduce informational asymmetry by conveying a higher degree of private information would be in line with previous theory (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006, Lardon, Deloof 2014, Francis et al. 2008, Cooke 1989). This would also support SOU's (2017, p. 342) criticism regarding a general lack of transparency among TOAs and the proposal that TOAs should be required to present a cash flow statement, KPIs and to, regardless of accounting framework, adopt the depreciation of parts method (SOU 2017, pp. 20 & 154).

In relation to financial reporting harmonization, SOU (2017, p. 20) criticized the lack of harmonization among TOAs and that efforts should be made in order to facilitate understanding for consumers. As described in section 2.2, entities had the possibility to structure transactions to a higher degree under old Swedish GAAP. We argue that the transition from an accounting environment with transactional leeway to an IFRS-based framework would therefore provide an opportunity to harmonize the underlying accounting setting. Furthermore, theory would support an increase in within-country harmonization following IFRS adoption (Jones, Finley 2011). As such, an interesting point of study is the dynamics in our setting with ambitious TOAs transitioning from the disorganized old Swedish GAAP to the structured IFRS for SMEs-derived K3-framework.

To conclude, we believe that our sample of large and ambitious TOAs provides an optimal setting for the K3-framework in order to examine the potential effects on financial reporting quality (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006) and harmonization (Jones, Finley 2011) when transitioning from national GAAP to IFRS-based standards.

3.2.2 Apartment pricing

Our theoretical development has up until now focused on the financial reporting quality and financial reporting harmonization related to the K3 adoption among Swedish TOAs. However, as mentioned in section 2.3 in regard to our theoretical valuation model for tenant-owned apartments, we find it of great interest to examine how the financial information of TOAs is used from a market perspective. More specifically, we wish to examine how the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments.

In a market with rational investors, financial information should in theory be of central importance for valuation purposes (Barker 1998, Barker 1999, Imam et al. 2008), in line with the valuation model for tenant-owned apartments presented in section 2.3. However, the general debate in business press regarding Swedish apartment prices indicates that this might not be the case in practice. For example, Swedbank's economist Arturo Arques (Dagens Nyheter 2016), working with topics related to personal finance, claimed that apartment buyers generally have poor knowledge concerning the financial performance and position of TOAs. Instead, they focus on non-financial factors such as location and the general quality of the apartment. This is further supported by SBC (2018, p. 3), which found that only 11% of tenant-owners claimed to have good knowledge of their TOA's financials. At the same time, prices have tripled since 2005 (Valueguard 2018), at a considerably higher rate than Swedish GDP growth (SCB Statistikdatabasen 2018b). The increasing prices and corresponding increase in debt levels have been a main topic of concern for both the Swedish Central Bank (2017) and the Swedish Financial Supervisory Authority (2018).

The irrational behavior among apartment buyers, with a low focus on financial factors, is supported in previous literature, as the usage of financial information varies depending on the type of user. Professional users and more experienced private/retail investors rely heavier on unfiltered financial information (Elliott et al. 2008). In the Swedish housing market, the vast majority of investors can safely be assumed to belong to the private/retail group. In turn, this could indicate that the financial statements of TOAs are not used by investors when buying apartments, even though they should in theory affect the valuation. Furthermore, SOU proposed an increased focus on filtered information, by requiring the disclosure of KPIs (2017, p. 154) and that real estate agents should be required to disclose the tenant-owner's share of the TOA's net debt (SOU 2017, p. 316). Nevertheless, we find it of grave concern that prices

could be potentially detached from fundamental valuation factors. Therefore, it is of great importance to study the fundamental connection between financial information and tenant-owned apartment prices.

Similar to our reasoning concerning TOAs' financial reporting quality and K3 adoption above, we argue that the perceived ambition level of TOAs in our sample regarding transparency and conveyance of private information is high. Consequently, we believe this should facilitate the usage of financial information for potential apartment buyers, and therefore provide an ideal setting for examining the connection between TOAs' financial performance and position and the value of their tenant-owned apartments.

4. Hypotheses

To examine the effect of K3 adoption among Swedish TOAs, and the connection between TOAs' financial information and apartment pricing, we divide the logic of our hypotheses in accordance with our two specific purposes - *K3 adoption* and *apartment pricing*. The first part is further divided into two subcategories, *financial reporting quality* and *financial reporting harmonization.* We expect that K3 adoption should lead to an increase in financial reporting quality and harmonization, as outlined in section 4.1, following the effect of an IFRS for SMEs-derived framework and the size and ambition of the TOAs in our sample. Related to apartment pricing (section 4.2), we expect that non-professional apartment buyers do not use the unfiltered financial information presented by TOAs when valuing apartments, and therefore do not take into account the financial performance and position of TOAs.

4.1 K3 adoption

Continuing our reasoning in section 3.2.1, we claim that the transition from the unstructured old Swedish GAAP to the IFRS for SMEs-derived K3-framework should provide an improvement in financial reporting quality. As presented in section 3.1.2, studies regarding financial reporting quality have been conducted both in terms of accounting quality and disclosure quality. Building on previous research that have examined voluntary disclosure (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006, Francis et al. 2008, Cooke 1989), we aim to examine the effect of K3 adoption on TOAs' level of voluntary disclosure. Given that IFRS-based standards are seen as an improvement related to information quality (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006), we argue that the large TOAs in our sample, with a high ambition concerning their financial reporting, will increase their voluntary disclosure as a result of K3 adoption. To test for this, we will use self-constructed unweighted disclosure indexes, in line with previous research (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006, Francis et al. 2008, Cooke 1989). These disclosure indexes will concern the general level of voluntary disclosure by TOAs, as well as voluntary disclosure specifically related to TOAs' depreciation of parts method.

The reason for specifically focusing on TOAs' depreciation of parts method, is due to the fact that the method represents a new accounting treatment in the Swedish non-listed setting. It is

therefore interesting to examine not only the level of disclosure, but also the effect on the capitalization of investments. Given the subsequent enhancement principle and widespread use of the extended maintenance concept under old Swedish GAAP, as reasoned in section 2.2.1, we believe that K3 adoption should lead to an increased capitalization of investments. This because of the reduced allowance for immediate expensing, resulting in a closer resemblance of true economic values. Furthermore, we argue that a closer resemblance of true economic values would also imply higher financial reporting quality, in line with the reasoning presented by Hellman et al. (2011). Our formal test hypotheses are presented below in section 4.3.

The second subcategory relates to financial reporting harmonization among entities, which was part of the main purpose behind BFN's K-frameworks (section 2.2) and one of the main topics in SOU's proposed legislative changes specifically for TOAs (section 2.4). Furthermore, this is of special interest given the criticism from Castellum (2010) and FAR (2010) regarding the increased administrative burden and complexity of adopting the K3-framework. We will test for financial reporting harmonization using the same factors (general voluntary disclosure level, disclosure related to depreciation of parts and capitalization of investments) as above. We believe, in line with previous theory regarding harmonization following IFRS adoption (Jones, Finley 2011), that within-country harmonization should increase following the adoption of the IFRS for SMEs-derived K3-framework. This is also supported by the fact that old Swedish GAAP was unstructured (section 2.2), which would imply that the transition to K3 should provide a more harmonized accounting setting. Our hypotheses related to financial reporting harmonization are outlined below in section 4.3.

4.2 Apartment pricing

As discussed in sections 2.3 and 3.2.2, TOAs' financial performance and position should, in theory, have an impact on apartment prices. However, as elaborated on in section 3.2.2, apartment buyers represent a group of private investors with low financial knowledge. Previous literature would suggest that this group of non-professional private investors relies heavily on filtered information (Elliott et al. 2008). Even though real estate agents have to provide the annual report to potential buyers (SOU 2017, p. 316), there is no requirement to provide filtered and simplified financial information (SOU 2017, p. 154). Therefore, the current market for tenant-owned apartments is characterized by a high degree of unfiltered information that should according to previous research (Elliott et al. 2008) not be used by tenant-owned apartment

buyers. As such, our hypothesis is that the financial performance of TOAs is not reflected in tenant-owned apartment prices and the financial position of TOAs is in turn not fully reflected. The distinction between not being 'reflected' and not being 'fully reflected' relates to our ability to predict the theoretical impact that a TOA's financial position should have on tenant-owned apartment prices. This since the financial performance in our theoretical valuation model is dependent on predicted future values of the costs related to the tenant-owned apartment (CF_{owning}) (formula 2) and the WACC (formula 4). The financial position (ND_{sqm}), on the other hand, is related to the current situation of the TOA and we can therefore examine the direct relationship with tenant-owned apartment prices, in accordance with formula 5. Our formal test hypothesis is presented below in section 4.3.

4.3 Formal test hypotheses

The formal test hypotheses, and their corresponding assumptions under their null hypotheses, are presented below:

Table 1 – formal test hypotheses and their corresponding null hypotheses

K3 adoption	
Financial reporting quality	
Null hypothesis	**Formal hypothesis**
H0-1a: The level of disclosure has neither changed nor worsened as a result of K3 adoption	H1a: The level of disclosure has improved as a result of K3 adoption
H0-1b: The level of disclosure related to depreciation of parts has neither changed nor worsened as a result of K3 adoption	H1b: The level of disclosure related to depreciation of parts has improved as a result of K3 adoption
H0-1c: The capitalization of investments has neither changed nor decreased as a result of K3 adoption	H1c: The capitalization of investments has increased as a result of K3 adoption
Financial reporting harmonization	
Null hypothesis	**Formal hypothesis**
H0-2a: Harmonization of the level of disclosure has neither changed nor decreased as a result of K3 adoption	H2a: Harmonization of the level of disclosure has increased as a result of K3 adoption
H0-2b: Harmonization related to the disclosure of depreciation of parts has neither changed nor decreased as a result of K3 adoption	H2b: Harmonization related to the disclosure of depreciation of parts has increased as a result of K3 adoption
H0-2c: Harmonization related to capitalization of investments has neither changed nor decreased as a result of K3 adoption	H2c: Harmonization related to capitalization of investments has increased as a result of K3 adoption
Apartment pricing	
Null hypothesis	**Formal hypothesis**
H0-3: The financial performance of TOAs is reflected in tenant-owned apartment prices and the financial position of TOAs is fully reflected	H3: The financial performance of TOAs is not reflected in tenant-owned apartment prices and the financial position of TOAs is not fully reflected

5. Method

5.1 Research design

We conduct a quantitative study based on panel data containing TOAs' accounting and financial information, price data of tenant-owned apartments and qualitative judgement of disclosure parameters within these TOAs over the years 2010-2016. In order to examine measures of disclosure, we have used self-constructed unweighted disclosure indexes, in line with previous research (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006, Francis et al. 2008, Cooke 1989).

TOAs are expected to be relatively static in their nature in regard to their long-lived tangible assets and predictable revenue. As a result of this, the financial performance and position of TOAs are not expected to exhibit a volatile behavior over time, all else equal. Therefore, the nature of TOAs facilitates an ex-post event study measuring accounting information pre- and post K3 adoption.

5.1.1 Research design regarding K3 adoption

The judgements we have made in order to create our self-constructed, unweighted voluntary disclosure indexes are in line with previous research (de La Bruslerie, Gabteni 2014, Lardon, Deloof 2014, Paananen et al. 2016, Francis et al. 2008, Cooke 1989). Hypothesis testing regarding K3 adoption will revolve around three test variables - a general voluntary disclosure index (*Discl_index*), the level of disclosure related to depreciation of parts (*Dep_method_class*) and the capitalization rate of investments (*Cap_rate*). The disclosure index (*Discl_index*) is in turn based on five other variables we argue to be related to voluntary disclosure. These include the presence of an annual review that fulfils certain criteria (*Review*), a multi-year historical overview (*Hist_overview*), key performance indicators (*KPIs*) containing condensed financial information, a cash flow statement (*CF_stmnt*) and the level of disclosed information related to the TOA's depreciation of parts (*Dep_method_class*).

The variables are chosen because they all represent a voluntary disclosure decision beyond what is mandatorily required and have a relevant purpose for TOAs. KPIs and the cash flow statement are both suggested by SOU (2017, p. 154) to be included in TOAs' future financial

reports, while a multi-year historical overview is mentioned in the K3-framework (BFNAR 2012:1, p. 31) as a recommended, but not required, complement. Furthermore, the level of disclosed information related to TOAs' depreciation of parts is included given the fundamental importance of the property for a TOA's operations. It is also highly relevant given the change in depreciation method occurring as a result of K3 adoption. Since most TOAs had separated some of their assets in a way similar to the depreciation of parts method, we can compare disclosure between the post-K3 and pre-K3 periods. Finally, while it is mandatorily required to present an annual review (Årsredovisningslag (ÅRL) 1995, chapter 6 §1), the guidance in the K3-framework (BFNAR 2012:1, p. 31) revolves around the inclusion of 'material' information. However, the level of disclosed information within an annual review can vary, which is why we argue that an annual review should at least meet a certain standard to be classified as TOAs having voluntarily disclosed information within their annual reviews. These include for example the detail in which TOAs disclose information related to their properties, apartments, living area, major investments and maintenance operations.

All variables are binary except for *Dep_method_class* that takes a value between 0 and 4, based on a qualitative judgement of the level of information disclosed related to the TOAs' depreciation of parts, further explained in Appendix C. As we cannot determine whether any specific variable included in the index is more important than the others, the index is unweighted. The level of disclosure related to depreciation of parts is further tested on a stand-alone basis, as discussed in section 4.1. The disclosure index ranges between 0 and 1 and is constructed according to formula 6. An index value of 1 would imply that the TOA in question fully satisfies our requirements regarding good voluntary disclosure of relevant information to users, while a value close to 0 indicates poor disclosure.

$$Discl\_index_{n_t} = \frac{Review_{n_t} + Hist\_overview_{n_t} + KPIs_{n_t} + CF\_stmnt_{n_t} + \left(\frac{Dep\_method\_class_{n_t}}{4}\right)}{5} \qquad (6)$$

Where,

n : TOA identification number where $1 \leq n \geq 100$

$Review$: $The\ presence\ of\ an\ annual\ review\ that\ fulfils\ certain\ criteria$

$Hist\_overview$: $The\ presence\ of\ a\ multi\ year\ historical\ overview$

$KPIs$: $The\ presence\ of\ key\ performance\ indicators\ containing\ condensed\ financial\ information$

CF_stmnt: $The\ presence\ of\ a\ cash\ flow\ statement$

Dep_method_class: $Variable\ measuring\ the\ level\ of\ disclosure\ related\ to\ depreciation\ of\ parts$

The variable for the capitalization rate of investments (*Cap_rate*) also takes a value between 0 and 1, where 1 represents full capitalization, and is calculated as capital expenditure (*Capex*) as a share of the sum of capital expenditure (*Capex*) and expensed maintenance (*Planned_maintenance* + *Ongoing_maintenance_and_repairs*). A high value implies that the TOA in question capitalizes a large share of its total investments, maintenance and repairs. The variable is constructed as follows:

$$Cap\_rate_{n_t} = \frac{Capex_{n_t}}{Capex_{n_t} + Planned\_maintenance_{n_t} + Ongoing\_maintenance\_and\_repairs_{n_t}} \quad (7)$$

Where,

$Capex: Capital\ expenditure$

$Planned\_maintenance: Planned\ maintenance\ (not\ capitalized)\ conducted$

$Ongoing\_maintenance\_and\_repairs: Ongoing\ maintenance\ and\ repairs\ (not\ capitalized)\ conducted$

Our tests will be conducted on a post/pre-basis, where the mean values for the time period 2014-2016 are tested against the mean values for 2011-2013. Additionally, we will also test the values for the first year of K3 adoption (2014) against the values of the year prior to K3 adoption (2013). The year 2010 is excluded due to the fact that the oldest available annual report in our sample was for the fiscal year 2011. As such, we have financial, but no disclosure-related information for the fiscal year 2010. To handle TOAs reporting under different fiscal years, we have set the calendar year in which the fiscal year started as the reporting year.

Financial reporting quality is tested by comparing differences in means for the test variables *Discl_index*, *Dep_method_class* and *Cap_rate*. In order to take into account each TOA's respective differences, mean values for both periods are calculated for each TOA. The difference between the post-mean value and the pre-mean value is then also calculated for each TOA, as presented in formula 8. For the 2014/2013 test, only the specific values for the two years are tested, see formula 9. The mean value of the differences for all TOAs, formula 10, is then tested against the null hypothesis (that there is no difference between the periods) using a Z-test. The Z-test is applicable since we use dependent samples where the standard deviation of our population (100 TOAs over the entire event window) is known and where our sample size of 100 TOAs (post/pre) exceeds the central limit theorem requirement of 30.

$$Diff_{n_{Post/Pre}} = \overline{Variable}_{n_{Post}} - \overline{Variable}_{n_{Pre}} \quad (8)$$

Where,

$\overline{Variable}$: The mean value of the variable tested (Discl_index, Dep_method_class or Cap_rate)

pre : period between 2011 and 2013

$post$: period between 2014 and 2016

$$Diff_{n_{2014/2013}} = Variable_{n_{2014}} - Variable_{n_{2013}} \quad (9)$$

$$\bar{x}_{Variable} = \sum_{n=1}^{100} \frac{Diff_{n_t}}{100} \quad (10)$$

However, a change in financial reporting quality could also be explained by a general positive, or negative, trend over time. In order to account for this, we conduct an ordinary least squares (OLS) regression model, with dummy variables for the pre/post-period, as presented in formula 11. Should these dummies prove to be statistically significant, we can distinguish between a change related to K3 adoption and from a general trend over time.

$$Variable = \beta_0 + \beta_1 * Rep\_year + \beta_2 * Post\_event + \beta_3 * Pre\_post\_year\_dummy \quad (11)$$

Where,

Rep_year: Variable specifying the reporting year

$Post\_event$: Dummy variable taking the value 1 after K3 adoption

$Pre\_post\_year\_dummy = Rep\_year * Post\_event$

In order to test for financial reporting harmonization, the variance (formula 12) across all TOAs' individual mean values for the pre-K3 period is tested against the variance in the post-K3 period, as presented in formula 13. For the 2013/2014 test, only the specific values for the two years are tested, see formula 14. Financial reporting harmonization is tested by using the F-test for equality of two variances (Armitage, Matthews 2002, pp. 149-153), more specifically, our null hypothesis states that the variance pre-K3 is the same as the variance post-K3, or increases. Since the F-test is sensitive to non-normality, we also conduct the Levene (1960, pp. 278-292) and Brown-Forsythe (1974) tests that are more robust under non-normality. In order to distinguish between when the regular F-test, Levene (1960, pp. 278-292)

or Brown-Forsythe (1974) test can be applied, the Shapiro-Wilk test for non-normality (Royston 1992, pp. 117-119) is conducted.

$$s_t^2 = \frac{\sum_{n=1}^{100}\left(Variable_{n_t} - \overline{Variable_t}\right)^2}{N-1} \tag{12}$$

$$F_{Pre/Post} = \frac{s^2_{Variable_{Pre}}}{s^2_{Variable_{Post}}} \tag{13}$$

$$F_{2013/2014} = \frac{s^2_{Variable_{2013}}}{s^2_{Variable_{2014}}} \tag{14}$$

5.1.2 Research design regarding apartment pricing

To test if the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments, we use an OLS regression model consisting of non-financial-(*region_price_sqm*, *apt_rooms*, *aptfloor*, *elevator*, *balcony*) and financial variables (*Assfee_LessIntExp_sqm*, *Dep_sqm*, *Capex_sqm*, *Net_inc_sqm*, *Netdebt_sqm*). Financial variables are used as explanatory variables, while the non-financial variables are intended to act as control variables.

The non-financial variables are intended to control for factors, besides financial factors, that may explain the demand and supply of the apartment in question. Relating to the theoretical valuation model in 2.3, such factors would control for the perceived alternative income from an equivalent rental apartment ($R_{Renting}$). The variable *region_price_sqm* controls for the general price level of tenant-owned apartments in the TOA's region at the time (month) that an apartment was sold. Furthermore, the number of rooms (*apt_rooms*), story the apartment is situated on (*aptfloor*), the presence of an elevator (*elevator*) and/or balcony (*balcony*) are all factors we argue could have an impact on tenant-owned apartment prices.

The financial variables are directly linked to the factors in our theoretical valuation model in section 2.3. As such, *Assfee_LessIntExp_sqm* corresponds to $OPEX$ in our model, while *Capex_sqm*, *Dep_sqm* and *Net_inc_sqm* correspond to $CAPEX$, Dep and NI, respectively. Finally, *Netdebt_sqm* corresponds to ND_{sqm}. As a result, our initial regression model will include all variables included in formula 15, which is presented below:

$$Price\_sqm = \beta_0 + \beta_1 * region\_price\_sqm + \beta_2 * apt\_rooms + \beta_3 * aptfloor + \beta_4 * elevator + \beta_5 * balcony + \beta_6 * Assfee\_LessIntExp\_sqm + \beta_7 * Dep\_sqm + \beta_8 * Capex\_sqm + \beta_9 * Net\_inc\_sqm + \beta_{10} * Netdebt\_sqm \quad (15)$$

Where,

$Price\_sqm$: The transaction price divided by the total area, in sqm, of the apartment

$region\_price\_sqm$: Variable for regional price of tenant owned apartments per sqm in the month of the transaction

apt_rooms: How many rooms the apartment constitutes

$aptfloor$: Which story the apartment is situated on

$elevator$: Indicates whether the building the apartment resides in has an elevator

$balcony$: Indicates whether the apartment has a balcony

$Assfee\_LessIntExp\_sqm$: Association fees less interest expenses paid per sqm for the latest reporting year

Dep_sqm: Depreciation expenses divided by the TOA′s total area in sqm for the latest reporting year

$Capex\_sqm$: Capital expenditures divided by the TOA′s total area in sqm for the latest reporting year

Net_inc_sqm: Net income divided by the TOA′s total area in sqm for the latest reporting year

$Netdebt\_sqm$: Total interest bearing debt less cash and cash equivalents per sqm for the latest reporting year

Since we cannot be certain of the presence of heteroscedasticity among the residuals, the regression model works under the assumption of robust standard errors. Furthermore, we believe that TOA-specific factors can cause unobserved heterogeneity in our sample. As a result, we employ a fixed effects model. A Spearman rank correlation analysis is also conducted in order to examine the presence of multicollinearity. The robustness of our final model will also be analyzed by running the regression in three time periods, one over the entire event window, one prior to K3 adoption (2010-2013) and the final one following K3 adoption (2014-2016)

Variables are dropped if they lack observations or exhibit multicollinearity. The final model will then in turn be tested for whether our initial assumptions of heteroscedasticity and fixed effects (using a Durbin-Wu-Hausman test (1978)) were correct. Our theoretical valuation model includes the effect from other revenue besides association fees. However, TOAs disclosed the level of other revenue to a highly varying extent, thus making it difficult for us to separate the part of other revenue from tenant-owners and revenue originating from external sources. As a result, we have decided to exclude the impact of other revenue than association fees, in order to increase uniformity. Additionally, we will not take into account the changes in net working capital since we do not have access to data on this factor. We argue that the effect

of this should be small given (1) the small share of assets not attributable to TOAs' property, plant and equipment and (2) that TOAs are stable over time with no operational need or ambition to increase its operations.

5.2 Sample selection

Our study covers Swedish TOAs geographically dispersed across the country. In order to improve comparison, only TOAs formed before 2010 that had not changed fiscal reporting year since 2010 were selected. For our sample, we use a size criterion where the top-100 largest TOAs adopting K3, ranked by number of apartments, were included. This sample is different from the top-100 largest TOAs overall due to the number of TOAs adopting the K2-framework. The list of TOAs ranked by size was provided by Swedish government agency Lantmäteriet. The sample selection corresponds well with Hellman et al.'s (2015) study who, when measuring international accounting differences, selected the top-100 listed entities by market capitalization across countries.

5.3 Data collection

It is voluntary for TOAs to provide their annual reports to the Swedish Companies Registration Office, thus, only a very limited amount of reports was available from governmental sources. The accounting data were therefore manually collected using a 3-step approach.

In the first step, data were collected from the TOAs' own web pages and other web-based providers, such as allabrf.se and svenskbrf.se. Annual reports were collected for the years 2011-2016, of which 2010 numbers were collected from the 2011 annual reports. Around 50% of the 600 annual reports in the final sample could be collected this way. The fact that the oldest annual report in our sample is for the fiscal year of 2011 implies that we have no disclosure-related information for the year 2010. In the second step, we contacted all TOAs in our sample by phone and/or e-mail and asked for the missing reports. We obtained all missing reports except for 13 reports from 10 different TOAs. Reasons for not obtaining the reports were lack of time from administrators within the TOAs, that they could not find the reports[5] and that we

[5] It is surprising that some TOAs were missing older reports since all reports in our sample should still be archived according to Swedish law (Bokföringslag (BFL) 1999, chapter 7 §2)

could not reach the responsible person. In the final step, we contacted the company Värderingsdata that could provide us with the last reports.

At this stage, we had enough information to set our final sample, since we knew which TOAs were using the K3-framework and if any of the TOAs had changed their fiscal year during the event window. Due to the presence of TOAs adopting the K2-framework, the last TOA in our sample was ranked number 169 by size. Table 2 displays the sample selection process. We can conclude that 58 of the 169 largest TOAs are using K2, a framework for smaller entities (as defined in section 2.2), yet are individually managing properties with taxation values ranging up to 1 SEKb. Furthermore, the strong presence of associations that are members of HSB was apparent, with 82 of the 100 K3-TOAs being members. All financial information was hand-collected from the annual reports and inserted into datasheets, involving a highly detailed analysis of annual reports.

Table 2 – Sample selection of TOAs

Sample selection of TOAs	No. of observations
Selection of TOAs	
Largest Swedish TOAs by no. of apartments, from Lantmäteriet	169
Manual data selection	
- *TOAs adopting K2*	-58
- *Formed during event window*	-3
- *Changed fiscal reporting year during event window*	-7
- *Excluded due to fraudulent activities*	-1
Final sample	**100**

Notes: The table illustrates the initial sample and manual data selection of TOAs required to arrive at our final sample. Out of the 169 largest TOAs in Sweden, 58 of them adopted the K2-framework for 'smaller' entities and were therefore excluded from our sample. 3 TOAs were excluded since they were formed during our event window while 7 TOAs were excluded due to change in fiscal reporting years. The TOA "Brf Ida" was excluded from the sample due to allegations of fraudulent activities among board members and within the TOA's financial reports. The final sample consisted of the 100 largest TOAs adopting the K3-framework.

Price data was obtained from Svensk Mäklarstatistik, who collects information about more than 90% of all apartment transactions in Sweden. Since it is voluntary for real estate agents connected to the database to report registration number for the TOA in which an apartment is sold, there are most likely transactions not included in our data. Of the total 23,635 apartment transactions between 2011 and 2017, 1,238 transactions were removed due to the transactions having occurred prior to the release of the annual report for fiscal year 2010. This usually occurred around April/May 2011. Finally, 129 transactions were removed due to the lack of data for price per square meter, resulting in a final sample of 22,268 transactions, as outlined

in table 3 below. Average price data for regional prices per square meter each month was also obtained from Svensk Mäklarstatistik.

Table 3 – Sample selection of apartment transactions within sample of TOAs

Sample selection of apartment transactions for TOAs included in the sample	No. of observations
Selection of transactions	
Apartment transactions between 2011 - 2017 for selected TOAs	23,635
Manual data selection	
- No. of transactions prior to release of annual report for fiscal year 2010	-1,238
- Transactions missing price per sqm	-129
Final sample	**22,268**

Notes: The table illustrates the initial sample and manual data selection of apartment transactions required to arrive at our final sample. Using data obtained from Svensk Mäklarstatistik, and matching them to our sample of 100 TOAs, we obtained 23,635 apartment transactions occurring between 2011 and 2017. The major exclusion of transactions relates to transactions that occurred prior to the release of TOAs' annual reports for the fiscal year 2010, that often was released in April/May-2011. The final sample consisted of 22,268 apartment transactions for our sample of the 100 largest TOAs adopting the K3-framework.

The matching of financial information with apartment transactions was made by assuming that the annual report for a fiscal year became available to the market at the date of their respective annual general meeting (AGM). If a TOA did not state the date of their AGM, we assumed that the AGM occurred exactly one year after the previous year's AGM. Information about the exact date of AGMs were available in virtually all cases. In order to control for regional prices and changes over time, we created a regional monthly price variable (*region_price_sqm*) that was matched to each apartment transaction. The match was made on the closest possible region. For TOAs in the main cities (Stockholm, Gothenburg and Malmö) the average price in each TOA's respective city district was used. For the remaining TOAs, the closest possible region became the municipality.

6. Results

6.1 Descriptive statistics

Descriptive statistics are initially presented in order to provide an overview of our dataset and test variables. These are in turn divided into data related to TOAs (6.1.1) and to apartment transactions (6.1.2).

6.1.1 Tenant-owner associations

Out of the final sample of 100 TOAs, presented in Appendix D, table 4 shows that in terms of building age, 50% of the TOAs were finalized between the years 1960 and 1969.

Table 4 – Sample distribution of TOAs by age of their real estate properties

Building age	**No. of TOAs**
n.a.	1
1920-1929	2
1930-1939	5
1940-1949	6
1950-1959	12
1960-1969	50
1970-1979	22
1980-1990	2
∑	**100**

Notes: The table shows the distribution of TOAs in our sample by the year in which their buildings were completed.

Table 5 shows that 61% of the TOAs are located in the Stockholm region and that 36% of the TOAs contain between 400 and 499 apartments. A similar pattern can be seen cross-sectionally.

Table 5 – Sample distribution of TOAs by number of apartments and region

	Apartments per TOA									
Region	300-399	400-499	500-599	600-699	700-799	800-899	900-999	1,000-1,099	1,100-1,200	∑
Gävleborg		1								**1**
Halland	1									**1**
Jämtland	1									**1**
Norrbotten		1								**1**
Skåne	5	9	2		1		1			**18**
Stockholm	9	19	13	7	6	4	2	1		**61**
Södermanland		1								**1**
Uppsala						1				**1**
Västerbotten		1								**1**
Västernorrland				1	1			1		**3**
Västmanland			1							**1**
Västra Götaland		4	2				1		1	**8**
Östergötland			1		1					**2**
∑	**16**	**36**	**19**	**8**	**9**	**5**	**4**	**2**	**1**	**100**

Notes: The table shows the distribution of the 100 TOAs in our sample, by region and number of apartments per TOA. Sweden's three largest cities are situated as follows: Stockholm (Stockholm), Gothenburg (Västra Götaland), Malmö (Skåne).

Aggregated financial information for the 100 TOAs are presented in table 6. Between 2010 and 2016, TOAs' aggregated revenue has grown at an average annual growth rate of 2.6%, of which 86.5% of revenue was attributable to association fees. Out of the specified sources of expenditure, maintenance expenses were the largest in relation to revenue, constituting on average 16.1%. On an aggregate basis, the TOAs reported small, but positive, net income during all observed years, resulting in an average net profit margin of 4.5%. The annual net change in cash and cash equivalents has also been positive during the entire event window.

Looking at the financial position, property, plant and equipment constitutes the majority of the TOAs' asset base, amounting to 91.7% on average. During the event window, the asset base has grown at a rate of 6.6% which is considerably higher than their revenue. In terms of leverage, the TOAs' equity-to-assets ratio was on average 31.9%. Furthermore, there has been a clear trend of a decreasing cost of debt, reflecting the overall Swedish macro environment. The TOAs' cost of debt[6] declined from 3.8% in 2011 to 2.0% in 2016. Should cost of debt increase however, the TOAs' capability of financing increasing cost of debt through earnings is relatively weak, with an average interest coverage ratio[7] of 1.5. Finally, the association fees per square meter has increased at an average annual growth rate of 2.4%, from 572 SEK/sqm to 659 SEK/sqm. Total debt per square meter increased at more than twice the rate of association fees, at an average annual growth rate of 5.2%, from 1,929 SEK/sqm to 2,614 SEK/sqm.

[6] Interest expenses divided by total debt, calculated on opening balance

[7] Income before interest expenses divided by interest expenses

Table 6 – Aggregated financial multi-year overview of TOAs

Income statement (SEKm)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Average**
Association fees	2,198	2,277	2,342	2,400	2,468	2,507	2,534	
Ass. fees % of revenue	*87.0%*	*86.8%*	*86.9%*	*86.9%*	*86.6%*	*85.8%*	*86.0%*	*86.5%*
Revenue	2,527	2,625	2,695	2,762	2,849	2,922	2,946	
y-o-y %		*3.9%*	*2.7%*	*2.5%*	*3.2%*	*2.6%*	*0.8%*	*2.6%*
Depreciation expenses	-262	-276	-295	-329	-326	-350	-379	
% of revenue	*10.4%*	*10.5%*	*10.9%*	*11.9%*	*11.5%*	*12.0%*	*12.9%*	*11.5%*
Maintenance expenses	-431	-446	-433	-458	-463	-428	-444	
% of revenue	*17.0%*	*17.0%*	*16.1%*	*16.6%*	*16.3%*	*14.6%*	*15.1%*	*16.1%*
Interest expenses	-241	-302	-312	-306	-284	-237	-206	
% of revenue	*9.5%*	*11.5%*	*11.6%*	*11.1%*	*10.0%*	*8.1%*	*7.0%*	*9.8%*
Net income	5	52	49	73	171	278	236	
Net income margin	*0.2%*	*2.0%*	*1.8%*	*2.7%*	*6.0%*	*9.5%*	*8.0%*	*4.5%*
Balance sheet (SEKm)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Average**
Property, plant and equipment	11,505	11,988	12,684	13,465	14,269	15,086	15,873	
% of assets	*92.0%*	*91.8%*	*92.1%*	*91.4%*	*91.9%*	*91.6%*	*91.3%*	*91.7%*
Cash and cash equivalents	850	928	962	1,124	1,139	1,197	1,319	
% of assets	*6.8%*	*7.1%*	*7.0%*	*7.6%*	*7.3%*	*7.3%*	*7.6%*	*7.3%*
Total assets	12,511	13,053	13,772	14,737	15,531	16,463	17,382	
y-o-y %		*4.3%*	*5.5%*	*7.0%*	*5.4%*	*6.0%*	*5.6%*	*5.6%*
Equity	3,789	3,976	4,272	4,739	5,007	5,439	5,822	
Equity ratio	*30.3%*	*30.5%*	*31.0%*	*32.2%*	*32.2%*	*33.0%*	*33.5%*	*31.9%*
Debt	7,971	8,344	8,742	9,308	9,798	10,276	10,776	
Debt-to-equity ratio	*2.1*	*2.1*	*2.0*	*2.0*	*2.0*	*1.9*	*1.9*	*2.0*
Cash flow statement (SEKm)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Average**
Capital expenditure	-1,855	-810	-838	-1,119	-1,122	-1,171	-1,230	
% of revenue	*73.4%*	*30.9%*	*31.1%*	*40.5%*	*39.4%*	*40.1%*	*41.8%*	*42.1%*
Δ cash flow		78	34	162	16	58	122	
Δ debt		373	398	566	489	478	501	
Key performance indicators	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Average**
Living area (sqm)	3,842,988	3,835,473	3,836,635	3,837,411	3,838,553	3,839,675	3,842,087	
Total area (sqm)	4,132,552	4,132,252	4,131,921	4,129,933	4,129,380	4,120,736	4,121,867	
Living area % of total area	93.0%	92.8%	92.9%	92.9%	93.0%	93.2%	93.2%	93.0%
Interest coverage ratio	1.0	1.2	1.2	1.2	1.6	2.2	2.1	1.5
Cost of debt		3.8%	3.7%	3.5%	3.1%	2.4%	2.0%	3.0%
Ass. fees / living area (SEK/sqm)	572	594	610	625	643	653	659	622
y-o-y %		*3.8%*	*2.8%*	*2.5%*	*2.8%*	*1.5%*	*1.0%*	*2.4%*
Debt / total area (SEK/sqm)	1,929	2,019	2,116	2,254	2,373	2,494	2,614	2,257
y-o-y %		*4.7%*	*4.8%*	*6.5%*	*5.3%*	*5.1%*	*4.8%*	*5.2%*

Notes: The table presents an aggregated financial overview of the 100 TOAs in our sample during the examined time period (2010-2016). Note that all items in the TOAs' full income statements and balance sheets are not presented.

As can be seen in table 7 below, the average TOA in our sample contains 554 apartments, ranging from 384 to 1,171. For example, the TOAs manage assets, at book value, ranging from 15.7 SEKm to 726.9 SEKm, which in turn is financed with a debt level ranging from 0 to 388.1 SEKm. Looking at net debt per square meter (*Netdebt_sqm*), the average was 2,114 SEK/sqm.

Table 7 – Descriptive statistics of variables related to TOAs over the entire event window

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Apts	100	554	485	180	384	1,171
Revenue	700	27,609	25,005	10,996	4,742	81,804
Assfee_sqm	700	0.594	0.589	0.115	0.047	1.103
Assfee_LessIntExp_sqm	700	0.563	0.556	0.102	0.038	1.082
Dep_sqm	700	0.077	0.067	0.044	0.003	0.368
Capex_sqm	700	0.283	0.084	0.930	-0.056	17.784
Net_inc_sqm	700	0.034	0.037	0.084	-0.354	0.433
PPE	700	135,528	96,784	121,479	10,570	716,620
Assets	700	147,785	108,898	124,272	15,745	726,923
Cash	700	10,740	7,661	10,292	0	99,689
Equity	700	47,206	23,645	79,883	-7,764	542,020
Debt	700	93,165	72,577	70,309	0	388,125
Netdebt_sqm	700	2.114	1.657	1.727	-0.968	7.839
Discl_index	700	0.664	0.700	0.186	0.200	1.000
Dep_method_class	700	2.520	2.000	1.128	0.000	4.000
Cap_rate	700	0.448	0.484	0.338	-0.421	1.000

Notes: The table reports descriptive statistics of the variables related to TOAs. Variables with the denotation 'sqm' are values divided by the TOA's total area in square meters. 'Apts' is the number of apartments within the TOA. 'Revenue' is the annual total revenue. 'Assfee' equals association fees and represent the main source of revenue for TOAs. 'Assfee_LessIntExp_sqm' is a measure for operating expenses (association fees less interest expenses) related to the TOA. 'Dep', 'Capex' and 'Net_inc' represent depreciation expenses, capital expenditures and net income, respectively. 'PPE' equals property, plant and equipment while 'Assets' represents the TOA's total assets. 'Cash', 'Equity' and 'Debt' represent the TOA's total cash and cash equivalents, equity and debt respectively. 'Netdebt_sqm' is the total debt less cash and cash equivalents, divided by the TOA's total area in square meters. 'Discl_index', 'Dep_method_class' and 'Cap_rate' are the main test variables for financial reporting quality and financial reporting harmonization, where 'Discl_index' (taking a value between 0 and 1) measures the general level of voluntary disclosure while 'Dep_method_class' (taking a value between 0 and 4) specifically relates to the disclosure level related to TOAs' depreciation of parts method. 'Cap_rate' measures the share of capitalized investments in relation to total expenditures for investments, maintenance and repairs. All monetary values are in thousand SEK.

Table 8 below presents our main test variables related to financial reporting quality and financial reporting harmonization during our entire event window. The test results of our hypotheses will later be presented in section 6.2. The entire data sample consists of genuine TOAs, hence tax regulations do not influence our results. Regarding our main variables, both *Discl_index* and *Cap_rate* had a positive trend during our entire event window, with *Discl_index* going from 0.59 in 2011 to 0.79 in 2016, and *Cap_rate* going from 0.37 to 0.52. The level of disclosure related to the TOAs' depreciation of parts (*Dep_method_class*) did not show the same trend however. Even though it increased from 2.51 in 2011 to 2.64 in 2016, a decline occurred between 2013 and 2014, at the time of K3 adoption.

Table 8 – Annual overview of variables related to statistical tests for financial reporting quality and financial reporting harmonization

Values	2011	2012	2013	2014	2015	2016	∑	Average (%)
Aggregate								
Review	100	99	100	100	98	99	696	99%
Hist_overview	52	59	57	80	87	86	473	68%
KPIs	37	41	44	53	68	82	362	52%
CF_stmnt	43	42	47	55	59	64	353	50%
Average								**Average**
Dep_method_class	2.51	2.53	2.57	2.36	2.52	2.64		2.52
Cap_rate	0.37	0.41	0.46	0.48	0.53	0.52		0.45
Discl_index	0.59	0.61	0.62	0.69	0.75	0.79		0.66

Notes: The table shows the aggregated and average values of data variables related to our purpose of examining the financial reporting quality and financial reporting harmonization changes as a result of K3 adoption for the 100 TOAs in our sample. The variables 'Review', 'Hist_overview', 'KPIs', 'CF_stmnt' and 'Dep_method_class' are in turn included in the calculated voluntary disclosure index ('Discl_index') used for hypothesis testing. All variables in the table are binary, except for 'Discl_index', 'Dep_method_class' and 'Cap_rate'. 'Review' indicates whether the TOA has presented an annual review that has fulfilled certain criteria. 'Hist_overview' indictates the presence of a multi-year historical overview. 'KPIs' indicates the presence of key performance indicators containing condensed financial information, while 'CF_stmnt' takes a value of 1 if the TOA presents a cash flow statement. 'Dep_method_class' ranges from 0 to 4 and classifies the level of voluntary disclosure related to TOAs' depreciation of parts method. 'Cap_rate' measures the rate of investments that are capitalized as a share of total expenditures related to investments, maintenance and repairs.

Taking a closer look at disclosure related to TOAs' depreciation of parts method in table 9 below, we see a considerable change at the time of K3 adoption (2014), when the share of TOAs with relatively low disclosure (values 0 or 1) decreased from 16% to 6%. Furthermore, the share of TOAs with relatively high disclosure (values 3 or 4) also decreased from 42% to 24%.

Table 9 – Annual overview of TOAs classified according to their level of disclosure related to their depreciation of parts method

	Reporting year					
Dep_method_class	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
0	8	6	6	1	0	0
1	10	10	10	5	3	3
2	41	44	42	70	68	60
3	5	5	5	5	3	7
4	36	35	37	19	26	30
∑	**100**	**100**	**100**	**100**	**100**	**100**

Notes: The table provides an annual overview of how many TOAs in our sample were classified by each value of the variable 'Dep_method_class'. 'Dep_method_class' (taking a value between 0 and 4 where 4 is the highest possible disclosure) specifically relates to the disclosure level related to TOAs' depreciation of parts method.

6.1.2 Apartment transactions

Out of the final sample of 22,268 transactions with total transaction values of 41,238 SEKm, table 10 shows that 65% of all transactions occurred in, and 76% of transaction values, were attributable to the Stockholm region. The three regions Stockholm, Västra Götaland and Skåne accounted for 89% of all transactions and 94% of the transaction values.

Table 10 – Apartment transactions and values by region

Region	No. of transactions	%	Value of transactions (SEKm)	%
Gävleborgs län	124	1%	91	0%
Hallands län	199	1%	213	1%
Jämtlands län	131	1%	118	0%
Norrbottens län	122	1%	155	0%
Skåne län	3,051	14%	3,497	8%
Stockholms län	14,431	65%	31,216	76%
Södermanlands län	178	1%	148	0%
Uppsala län	329	1%	577	1%
Västerbottens län	225	1%	126	0%
Västernorrlands län	584	3%	396	1%
Västmanlands län	256	1%	220	1%
Västra Götalands län	2,242	10%	4,110	10%
Östergötlands län	396	2%	371	1%
∑	**22,268**		**41,238**	

Notes: The table shows the distribution of our sample of apartment transactions and values by region, as well as percentage distribution. Sweden's three largest cities are situated as follows: Stockholm (Stockholm), Gothenburg (Västra Götaland), Malmö (Skåne). Note however that 7 transactions lacked transaction values, but had transaction price per square meter and were therefore included in the sample.

In our sample, the number and value of apartment transactions have a positive relationship with the size of the TOA in question, as shown in table 11, with the largest associations, ranked by number of apartments, accounting for the largest number and value of transactions.

Table 11 – Apartment transactions and values by size of the TOA (No. of apts)

Tenant-owner association rank by size (No. of apts)	No. of transactions	%	Value of transactions (SEKm)	%
1-10	3,776	17%	7,367	18%
11-20	2,912	13%	5,933	14%
21-30	2,509	11%	5,247	13%
31-40	2,376	11%	4,102	10%
41-50	2,115	9%	4,400	11%
51-60	2,030	9%	3,052	7%
61-70	1,495	7%	2,774	7%
71-80	1,822	8%	3,422	8%
81-90	1,757	8%	2,607	6%
91-100	1,476	7%	2,335	6%
∑	**22,268**		**41,238**	

Notes: The table shows the distribution of apartment transactions and values by association rank, as well as percentage distribution. The ranking is based on the number of apartments within each TOA where the largest TOA is given the rank #1. Note however that 7 transactions lacked transaction values, but had transaction price per square meter and were therefore included in the sample.

As presented in table 12 below, the median apartment was situated on the second floor, had two rooms and no balcony. The average transaction price was 1.852 SEKm, while the average price per square meter was 31,923 SEK/sqm. The cheapest apartment in the sample was sold for 10,000 SEK with a price per square meter of 164 SEK/sqm. Values deemed to be abnormally small, or large, have been subject to cross-checking and reasonability testing.

Table 12 – Descriptive statistics of variables related to apartment transactions

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
apt_price	22,261	1,852	1,720	988	10	13,500
price_sqm	22,268	31.923	26.210	21.611	0.164	149.130
region_price_sqm	22,268	34.847	31.202	18.949	3.661	99.363
apt_rooms	22,243	2.46	2.00	0.94	1.00	7.00
aptfloor	20,198	2.95	2.00	2.38	-1.00	17.00
elevator	19,519	0.47	0.00	0.50	0.00	1.00
balcony	5,466	0.36	0.00	0.48	0.00	1.00

Notes: The table reports descriptive statistics of the variables related to apartment transactions. 'apt_price' corresponds to the price the apartment in question was sold for, while 'price_sqm' denotes the transaction value per square meter. 'region_price_sqm' is a control variable that measures the regional price level (per square meter) during the month the apartment was sold, where the region is based on the closest available price region to the apartment. 'apt_rooms' indicates how many rooms the apartment constitutes.'aptfloor' measures which story the apartment is situated on. 'elevator' and 'balcony' are binary variables, indicating whether the sold apartment had a balcony and/or elevator. All monetary values are in thousand SEK.

As seen in table 13 below, none of our variables exhibited a strong correlation (>0.5) using Spearman's rank correlation. A complete list of all variables used, and their respective definitions is presented in Appendix E.

Table 13 – Spearman ranked correlation statistics for all test variables

Spearman coefficients	region_price_sqm	apt_rooms	aptfloor	elevator	balcony	Assfee_LessIntExp_sqm	Dep_sqm	Capex_sqm	Net_inc_sqm	Netdebt_sqm
region_price_sqm	1.0000									
apt_rooms	-0.1984	1.0000								
aptfloor	-0.0498	0.0478	1.0000							
elevator	0.1275	-0.0545	0.3813	1.0000						
balcony	-0.2313	0.1841	0.0297	-0.0152	1.0000					
Assfee_LessIntExp_sqm	0.0395	-0.0620	-0.0842	-0.0338	0.0223	1.0000				
Dep_sqm	0.3949	-0.0381	-0.0160	0.1450	-0.0338	0.2499	1.0000			
Capex_sqm	0.0329	-0.0069	-0.0086	0.0721	0.0156	-0.2140	-0.0119	1.0000		
Net_inc_sqm	-0.0059	-0.0166	-0.0062	-0.0506	0.0281	0.3897	-0.1033	-0.0128	1.0000	
Netdebt_sqm	0.2546	-0.0265	-0.0063	0.0885	-0.0432	-0.0511	0.4876	0.1437	-0.2739	1.0000

Notes: The table presents the Spearman rank correlation coefficients of all test variables included in the statistical regression model. 'region_price_sqm' is a control variable that measures the regional price level (per square meter) during the month the apartment was sold, where the region is based on the closest available price region to the apartment. 'apt_rooms' indicates how many rooms the apartment constitutes. 'aptfloor' measures which story the apartment is situated on while 'apt_area' denotes the total area in square meter that the apartment constituted. 'elevator' and 'balcony' are binary variables, indicating whether the sold apartment had a balcony and/or elevator. Financial variables with the denotation '_sqm' are values divided by the TOA's total area in square meters. 'Assfee_LessIntExp' is a measure for a TOA's total operating expenses, since we argue that a TOA's association fee (less financial costs) should cover all the TOA's operating needs. 'Dep', 'Capex' 'Net_inc' stand for depreciation expenses, capital expenditures and net income, respectively. 'Netdebt' is the TOA's total debt less cash and cash equivalents.

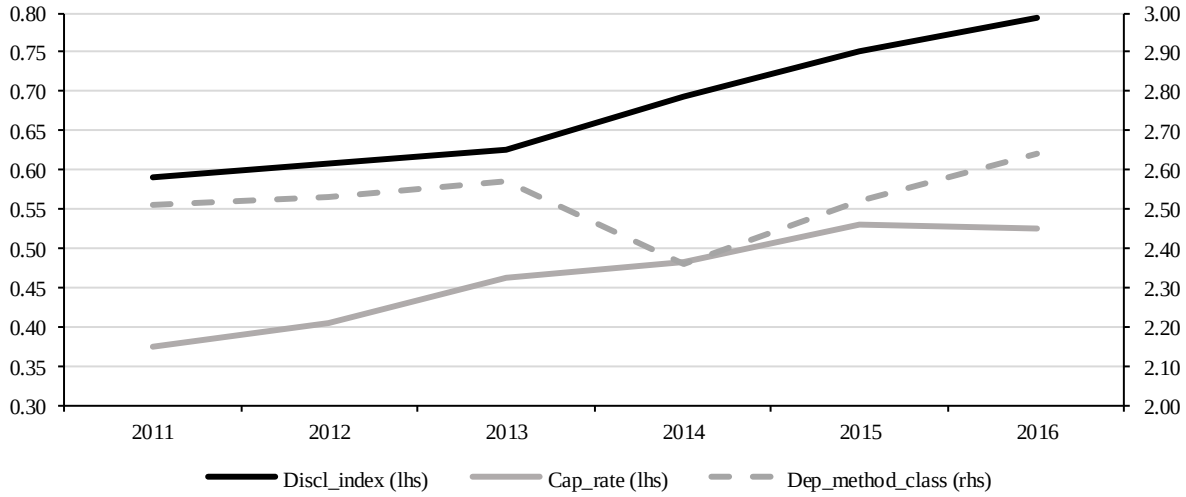
6.2 Results related to K3 adoption

The results related to our first purpose, as discussed in sections 3.2.1 and 4.1, of examining the potential effects on financial reporting quality and financial reporting harmonization following TOAs' adoption of the K3-framework, are presented below.

6.2.1 Financial reporting quality

Figure 5 presents an illustrative overview over the mean values of our three test variables *Discl_index*, *Dep_method_class* and *Cap_rate* over the entire event window in order to facilitate the interpretation of our statistical tests. For both *Discl_index* and *Cap_rate*, we see a positive trend throughout the entire event window, although *Discl_index* exhibits an additional upturn at the time of K3 adoption (2014). *Dep_method_class* on the other hand sees an upward rising trend up until the time of K3 adoption, where there is a noticeable decline in 2014. Following 2014, the trend turns positive once again and increases to prior levels. Given the variation in behavior for the three variables, emphasis will be put on different events over time depending on the variable in question.

Figure 5 – Annual development of variables related to financial reporting quality and harmonization



Notes: The figure presents an overview of the annual mean values of our test variables related to K3 adoption, and their development over our event window. 'Discl_index' is a voluntary disclosure index based on five components that measures the general level of voluntary disclosure provided by the TOA. These include an annual review that fulfils certain criteria, a multi-year historical overview, key performance indicators containing condensed financial information, a cash flow statement and the level of disclosed information related to the TOA's depreciation of parts ('Dep_method_class'). All variables in 'Discl_index' are binary except for 'Dep_method_class' that takes a value between 0 and 4, based on a qualitative judgement of the level of useful information related to the TOA's depreciation of parts. 'Cap_rate' measures the level of capitalization of investments, by calculating capital expenditure as a share of the sum of capital expenditure and expensed maintenance.

Table 14 includes the test results of all TOAs' individual differences between both post-K3 (2014-2016) and pre-K3 (2011-2013), as well as between the first year of K3 adoption (2014) and the year prior to K3 adoption (2013), for all three test variables.

Disclosure index

The increase in general disclosure (*Discl_index*) is statistically significant on a 1% level, both between post-K3 and pre-K3 and at the time of K3 adoption. Between pre-K3 and post-K3, the general level of disclosure increased from 0.608 to 0.746, equivalent to a 23% increase in disclosure. At the time of K3 adoption, it increased from 0.625 to 0.694, representing an 11% increase. The increase is also statistically significant when controlling for the general upward sloping trend, as seen in table 15, where the variable *Pre_post_year_dummy* is statistically significant on a 5% level. Thus, we can reject the null hypothesis H0-1a, that the level of disclosure has neither changed nor worsened as a result of K3 adoption.

Disclosure related to depreciation of parts

The disclosure specifically related to depreciation of parts (*Dep_method_class*) exhibited a behavior opposite to our hypothesis (H1b), by a decline of -0.210, equivalent to an 8% decrease, at the time of K3 adoption, statistically significant on a 5% level. The statistically insignificant change between post-K3 and pre-K3 becomes irrelevant to our study since the main observation in this case concerns the sudden decline at the time of K3 adoption. However, it is worth noting that the level of disclosure later rebounds to prior levels seen before K3 adoption. We can therefore not reject our null hypothesis H0-1b, that the level of disclosure related to depreciation of parts has neither changed nor worsened as a result of K3 adoption, since we observe a statistically significant decline at the time of K3 adoption.

Capitalization of investments

The level of capitalization of investments (*Cap_rate*) shows a statistically significant increase, on a 1% level, between pre-K3 and post-K3, increasing from 0.414 to 0.512, equivalent to a 24% increase. The change is not statistically significant at the time of K3 adoption. Furthermore, as shown in table 15, we find no statistically significant increase in the capitalization of investments as a result of K3 adoption, when controlling for the upward rising trend, as *Pre_post_year_dummy* lacks significance. As a result, our null hypothesis H0-1c, that the capitalization of investments has neither changed nor decreased as a result of K3 adoption, cannot be rejected, even though there is a statistically significant increase over time.

Table 14 – Statistics and Z-test results for financial reporting quality

Financial reporting quality	Obs	Mean value		Mean diff	Std. Dev.	Z-score	Pr (Z < z)	Pr (|Z| > |z|)	Pr (Z > z)
		Pre	Post						
Discl_index									
Post (2014-2016) versus Pre (2011-2013)	100	0.608	0.746	**0.139**	0.156	8.877	1.000	0.000	0.000
2014 versus 2013	100	0.625	0.694	**0.070**	0.164	4.232	1.000	0.000	0.000
Dep_method_class									
Post (2014-2016) versus Pre (2011-2013)	100	2.537	2.507	**-0.030**	1.131	-0.265	0.395	0.791	0.605
2014 versus 2013	100	2.570	2.360	**-0.210**	1.241	-1.692	0.045	0.091	0.955
Cap_rate									
Post (2014-2016) versus Pre (2011-2013)	100	0.414	0.512	**0.099**	0.296	3.327	1.000	0.001	0.000
2014 versus 2013	100	0.462	0.483	**0.021**	0.356	0.578	0.718	0.563	0.282

Notes: The table shows the results for the measurements related to the effects on financial reporting quality as a result of K3 adoption. Financial reporting quality is tested by comparing differences in means for the test variables 'Discl_index', 'Dep_method_class' and 'Cap_rate'. In order to take into account each TOA's respective differences, mean values for the different periods are calculated for each TOA. The difference between the post-mean value and the pre-mean value is then also calculated for each TOA. The mean value of the differences for all TOAs are then in turn tested against the null hypothesis (that there is no difference between the periods) using a Z-test. 'Discl_index' is a voluntary disclosure index based on five components that measures the level of voluntary disclosure provided by the TOA. These include an annual review that fulfil certain criteria, a multi-year historical overview, key performance indicators containing condensed financial information, a cash flow statement and the level of disclosed information related to the TOA's depreciation of parts ('Dep_method_class'). All variables in 'Discl_index' are binary except for 'Dep_method_class' that takes a value between 0 and 4, based on a qualitative judgement of the level of useful information related to the TOA's depreciation of parts. 'Cap_rate' measures the level of capitalization of investments, by calculating capital expenditure as a share of the sum of capital expenditure and expensed maintenance.

Table 15 – Regression tests for trends in financial reporting quality

			Regression coefficients		
	Obs	**R-squared**	**Rep_year**	**post_event**	**Pre_post_year_dummy**
Discl_index	600	0.1657	0.018*	-65.402**	**0.033****
Dep_method_class	600	0.0059	0.030	-221.770	**0.110**
Cap_rate	600	0.0288	0.044**	48.013	**-0.024**

*Notes: The table shows the results for the regression models used to distinguish between the effect related to K3 adoption from a general trend over time. 'Pre_post_year_dummy' indicates whether K3 adoption has had a statistically significant effect on financial reporting quality, besides any effect attributable to an overall trend. Note that probabilities are calculated using one-sided tests. 'Discl_index' is a voluntary disclosure index based on five components that measures the level of voluntary disclosure provided by the TOA. These include an annual review that fulfil certain criteria, a multi-year historical overview, key performance indicators containing condensed financial information, a cash flow statement and the level of disclosed information related to the TOA's depreciation of parts ('Dep_method_class'). All variables in 'Discl_index' are binary except for 'Dep_method_class' that takes a value between 0 and 4, based on a qualitative judgement of the level of useful information related to the TOA's depreciation of parts. 'Cap_rate' measures the level of capitalization of investments, by calculating capital expenditure as a share of the sum of capital expenditure and expensed maintenance. Significance level: *** p<0.01, ** p<0.05, * p<0.1.*

6.2.2 Financial reporting harmonization

Since the standard F-test for equality of variances is sensitive to non-normality, Appendix F presents the Shapiro-Wilk (1992, pp. 117-119) test for non-normality, in order to determine which variance test (F, Levene or Brown-Forsythe) that should be applied. According to the Shapiro-Wilk (1992, pp. 117-119) test, the F-test can be applied for the capitalization of investments (*Cap_rate*) in both post-K3 versus pre-K3 and at the time of K3 adoption. For both the general level of disclosure (*Discl_index*) and disclosure related to depreciation of parts (*Dep_method_class*), the F-test can only be applied at the time of K3 adoption. The test results for accounting harmonization are presented in table 16.

Harmonization related to the voluntary disclosure index

According to our test results, the standard deviation of TOAs' general level of voluntary disclosure sees a statistically significant change, on a 5% level, only at the time of K3 adoption. At the time of K3 adoption, the harmonization of general disclosure increases, measured by a decrease in standard deviation from 19.0% to 16.0%. Since we argue that harmonization is intended to be measured over longer periods of time, we put emphasis on the test between pre-K3 and post-K3. As a result, we fail to reject the null hypothesis H0-2a that harmonization related to disclosure has neither changed nor decreased as a result of K3 adoption.

Harmonization related to the disclosure of depreciation of parts

For harmonization related to the disclosure of depreciation of parts, we find a statistically significant increase, on a 1% level, in harmonization between pre-K3 and post-K3, measured by a decrease in standard deviation from 1.200 to 0.803. The statistically significant increase, on a 1% level, also holds at the time of K3 adoption, seeing a decrease in standard deviation from 1.249 to 0.882. Thus, the null hypothesis H0-2b, that harmonization related to the disclosure of depreciation of parts has neither changed nor decreased as a result of K3 adoption, can be rejected.

Harmonization related to the capitalization of investments

Regarding the harmonization related to the capitalization of investments, we find no statistically significant change during any of the observed time periods. Therefore, we cannot reject our null hypothesis H0-2c, that harmonization related to capitalization of investments has neither changed nor decreased as a result of K3 adoption.

Table 16 – Statistics, F-test, Levene and Brown-Forsythe tests for equality of variances related to tests for financial reporting harmonization

		Std. Dev			Ha: ratio < 1	Ha: ratio != 1	Ha: ratio > 1	Levene test		Brown-Forsythe	
Financial reporting harmonization	**Obs**	**Pre**	**Post**	**F-score**	**Pr (F < f)**	**2 * Pr (F > f)**	**Pr (F > f)**	**W0**	**Pr > F**	**W50**	**Pr > F**
Discl_index											
Post (2014-2016) versus Pre (2011-2013)	100	0.168	0.144	1.348	0.930	0.139	0.070	2.515	**0.114**	1.723	**0.191**
2014 versus 2013	100	0.190	0.160	1.400	0.952	0.096	**0.048**	6.824	0.010	5.433	0.021
Dep_method_class											
Post (2014-2016) versus Pre (2011-2013)	100	1.200	0.803	2.233	1.000	0.000	0.000	19.895	**0.000**	12.133	**0.001**
2014 versus 2013	100	1.249	0.882	2.006	1.000	0.001	**0.000**	26.907	0.000	17.168	0.000
Cap_rate											
Post (2014-2016) versus Pre (2011-2013)	100	0.239	0.253	0.892	0.285	0.571	**0.715**	0.234	0.629	0.235	0.629
2014 versus 2013	100	0.335	0.343	0.952	0.403	0.807	**0.597**	0.326	0.569	0.322	0.571

Notes: The table shows the results for the measurements related to accounting harmonization, by calculating the variance across all TOAs' individual mean values for the pre-period and testing it against the variance in the post-period. The highlighted numbers represent the relevant probability for each individual test statistic. For the 2013/2014 test, only the specific values for the two years are tested. The F-score, Levene and Brown-Forsythe test scores are presented along with their respective probabilities. 'Discl_index' is a voluntary disclosure index based on five components that measures the level of voluntary disclosure provided by the TOA. These include an annual review that fulfils certain criteria, a multi-year historical overview, key performance indicators containing condensed financial information, a cash flow statement and the level of disclosed information related to the TOA's depreciation of parts ('Dep_method_class'). All variables in 'Discl_index' are binary except for 'Dep_method_class' that takes a value between 0 and 4, based on a qualitative judgement of the level of useful information related to the TOA's depreciation of parts. 'Cap_rate' measures the level of capitalization of investments, by calculating capital expenditure as a share of the sum of capital expenditure and expensed maintenance.

6.3 Results related to apartment pricing

Our study now expands from K3 adoption into the second purpose of our thesis, to examine how the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments, as previously discussed in section 3.2.2 and section 4.2.

Our regression models, as described in section 5.1.2, are presented in table 17 below. Due to few observations, the variables *elevator* and *balcony* were dropped from the model, see models 1-3. As seen in Appendix G, the residuals of our models exhibit heteroscedastic behavior, supporting our reasoning behind the usage of robust standard errors in our regressions. Furthermore, the robustness behind our assumption regarding fixed effects is validated according to the Durbin-Wu-Hausman test (1978), since we find statistically significant differences between using fixed effects and random effects, as seen in Appendix H.

Non-financial factors

Three of our initial five control variables are statistically significant on a 1% level (*region_price_sqm*, *apt_rooms*, *aptfloor*), providing statistically significant support for the influence of non-financial factors on apartment prices, in accordance with theory (section 3.2.2) and our previous reasoning (sections 4.2 and 5.1.2). We find that the number of rooms in an apartment had a negative effect on apartment prices (-3,527 SEK/sqm per added room), while the story the apartment in question is situated on has a positive effect (231 SEK/sqm per story). Additionally, we also find that the regional price during the month the apartment is sold (*region_price_sqm*) has almost a one-to-one (0.982) relationship with *price_sqm*.

Financial factors

Only two financial factors (*Assfee_LessIntExp_sqm* and *Netdebt_sqm*) exhibited statistical significance on a 5% level or less. According to our findings, an increase in $OPEX$ (*Assfee_LessIntExp_sqm* in our regression model) of 100 SEK/sqm, would lower the apartment price by 545 SEK/sqm. Additionally, we find that depreciation (*Dep_sqm*), capital expenditures (*Capex_sqm*) and net income (*Net_inc_sqm*) all lacked statistical significance. As reasoned in section 2.3, in the long-run, depreciation and capital expenditures should cancel each other out while net income should be zero. Therefore, our model is not violated.

In regard to ND_{sqm} (*Netdebt_sqm* in our regression model), our theoretical valuation model in section 2.3 would suggest a negative relationship with apartment price per square meter (*price_sqm* in our regression model) of -1.0. One of the main findings from our regressions is therefore the lack of magnitude that the TOA's financial position has on apartment prices, where an increase in net debt of 100 SEK/sqm would lower the apartment price per square meter by 22 SEK/sqm. Furthermore, when testing the coefficient for *Netdebt_sqm* against its predicted value of -1.0, we can on a 1% level reject this relationship, indicating strong statistical support that net debt does not have the full financial impact as theory would suggest.

Model summary

Our final model, with an R-squared value of 0.928, consists of three non-financial factors, of which one relates to the regional price environment, and three financial factors. Our conclusions regarding apartment pricing are that (1) apartment prices are to a large extent affected by non-financial factors, (2) the financial performance of TOAs have a small but statistically significant impact and (3) the financial position of TOAs is not to a full extent reflected in tenant-owned apartment prices. Since the financial position of TOAs are not fully reflected in the valuation of tenant-owned apartments, we can reject the null hypothesis H0-3, that the financial performance of TOAs is reflected in tenant-owned apartment prices and the financial position of TOAs is fully reflected.

Table 17 – Results of fixed effects regression model regarding apartment pricing

Variables (price_sqm dependent)	Model 1	Model 2	Final model
Control variables			
region_price_sqm	1.031***	1.048***	0.982***
apt_rooms	-2.898***	-3.119***	-3.527***
aptfloor	0.230***	0.196***	0.231***
elevator	-0.0428		
balcony	-0.559***	-0.431***	
Explanatory variables			
Assfee_LessIntExp_sqm	-7.884**	-9.948***	-5.448***
Dep_sqm	-6.950*	-5.385	3.249
Capex_sqm	-0.111	-0.100	0.000
Net_inc_sqm	-1.364	-1.438	-0.823
Netdebt_sqm	-0.187	-0.309	-0.224**
Constant	8.191***	9.651***	9.043***
Observations	3,975	5,233	20,185
R-squared	0.930	0.922	0.928
Standard errors, STATA assumption	Robust	Robust	Robust
Fixed effects	By TOA	By TOA	By TOA

*Notes: The table presents the OLS fixed effects regression models, using robust standard errors, used to examine the effect of TOAs' financial information on tenant-owned apartment prices. For each step (models 1-3), variables that lacked data or exhibited multicollinearity were dropped. The dependent variable 'price_sqm' denotes the transaction value per square meter. 'region_price_sqm' is a control variable that measures the regional price level (per square meter) during the month the apartment was sold, where the region is based on the closest available price region to the apartment. 'apt_rooms' indicates how many rooms the apartment constitutes. 'aptfloor' measures which story the apartment is situated on. 'elevator' and 'balcony' are binary variables, indicating whether the sold apartment had a balcony and/or elevator. Financial variables with the denotation '_sqm' are values divided by the TOA's total area in square meters. 'Assfee_LessIntExp' is a measure for a TOA's total operating expenses, since we argue that a TOA's association fees (less financial costs) should cover all the TOA's operating needs. 'Dep', 'Capex' 'Net_inc' stand for depreciation expenses, capital expenditures and net income, respectively. 'Netdebt' is the TOA's total debt less cash and cash equivalents. All monetary values are in thousand SEK. Significance level: *** p<0.01, ** p<0.05, * p<0.1.*

7. Discussion

7.1 Interpretation of results

In the following section, we will discuss and analyze the results presented in section 6 by connecting our findings to previous literature and empirics. In section 7.2, we also highlight the limitations associated with our study.

7.1.1 The K3-framework's positive impact on tenant-owner associations

In the discussion below, we aim to connect previous research and our empirical findings to the first purpose of our thesis, to examine the potential effects on financial reporting quality and financial reporting harmonization following TOAs' adoption of the K3-framework. A summary of our empirical findings is presented below in table 18.

Table 18 – Overview of empirical findings regarding financial reporting quality and financial reporting harmonization following K3 adoption

	2013 vs 2014	2011-2013 vs 2014-2016
Overview of empirical findings related to K3 adoption	**Time of adoption**	**Pre-K3 vs post-K3**
Financial reporting quality		
Discl_index	Increase	Increase
Dep_method_class	Decline	Not significant
Cap_rate	Not significant	Increase*
Financial reporting harmonization		
Discl_index	Increase	Not significant
Dep_method_class	Increase	Increase
Cap_rate	Not significant	Not significant

*Notes: The table provides an illustrative overview of the statistical tests related to K3 adoption. 'Discl_index' is a voluntary disclosure index based on five components that measures the general level of voluntary disclosure provided by the TOA. These include an annual review that fulfils certain criteria, a multi-year historical overview, key performance indicators containing condensed financial information, a cash flow statement and the level of disclosed information related to the TOA's depreciation of parts ('Dep_method_class'). All variables in 'Discl_index' are binary except for 'Dep_method_class' that takes a value between 0 and 4, based on a qualitative judgement of the level of useful information related to the TOA's depreciation of parts. 'Cap_rate' measures the level of capitalization of investments, by calculating capital expenditure as a share of the sum of capital expenditure and expensed maintenance. * note that we cannot exclude that the increase is only due to a general trend.*

General level of voluntary disclosure

Our findings regarding financial reporting quality support an improvement following K3 adoption. Both at the time of K3 adoption as well as pre-K3 versus post-K3, we find a statistically significant improvement in the general level of voluntary disclosure (*Discl_index*). The improvement is related to both a general increase over time and specifically to the K3 adoption. As seen in table 8, the increase in *Discl_index* is driven by a broad increase of all component variables, except for *Dep_method_class*, while *Hist_overview* accounts for the largest increase in disclosure. This can in turn be linked to an improvement in financial reporting quality due to increased conveyance of private information, and a belief among TOAs that an increased level of disclosure would benefit themselves, in line with Lardon & Deloof's (2014) findings. We argue that the perceived benefits from increased voluntary disclosure is related to the size of TOAs, the high number of apartment transactions occurring within them and therefore a willingness to present more information to their tenant-owners and potential apartment buyers. Furthermore, the increase in voluntary disclosure of condensed filtered information, such as a multi-year historical overview and KPIs, could indicate a willingness and ambition among TOAs to present information that is easier for non-professionals to understand. This would be in line with theory by Elliott et al. (2008) and SOU's (2017, p. 154) proposal for disclosing KPIs and a cash flow statement. Even though Elliott et al. (2008) studied filtered information packaged and provided by financial intermediaries, this would represent an attempt by TOAs themselves to provide a similar type of filtered information.

Furthermore, we argue that financial reporting quality specifically related to the K3 adoption could be influenced by a 'fresh start' for many TOAs. Even though the TOAs in our sample are argued to be ambitious and transparent regarding their accounting practices, we believe that the transition from old Swedish GAAP to K3 created an internal discussion about the level of voluntary disclosure provided. Instead of being influenced by previous years' financial reports as guidance when creating future reports, the new framework represented an opportunity for TOAs to rethink their current processes. In such a case, it is reasonable to believe that an ambitious TOA would like to convey larger amounts of private, relevant information, in order to increase transparency. This can be directly linked to previous theory that documented an increase in voluntary disclosure following IFRS adoption (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006). As such, we contribute to previous theory within this area by documenting an increase in financial reporting quality following K3 adoption.

Our findings regarding financial reporting harmonization, when looking at the general level of disclosure, are not that clear. Even though we reasoned in sections 3.2.1 and 4.1 that the transition from the unstructured old Swedish GAAP to the K3-framework would harmonize financial reporting among TOAs, we find no statistically significant improvement over time. This would go against previous theory (Jones, Finley 2011) regarding within-country harmonization following IFRS, but be in line with previous research regarding within-country harmonization, not specifically related to IFRS adoption (Archer et al. 1995, Aisbitt 2001). On the other hand, we find a statistically significant improvement at the time of K3 adoption.

Disclosure related to depreciation of parts

Looking specifically at the level of disclosure related to TOAs' depreciation of parts (*Dep_method_class*) method, we see no statistically significant change between pre-K3 and post-K3. However, in contrast to the general level of disclosure, we find a statistically significant decrease at the time of K3 adoption. We argue that the decline can be related to the uncertainty at the time of implementation of a new depreciation method that represented a significant change from previous accounting methods in Sweden. The perceived level of complexity is supported by Quagli & Paoloni's (2012) findings regarding implementation of IFRS for SMEs while Perera & Chand (2015) discuss the challenges that occurred when IFRS for SMEs was first implemented. Since the level of disclosure once again increases after the implementation to levels prior to K3 adoption, this would support the idea that complexity was present at the time of adoption but decreased over time due to increased experience. Furthermore, we believe that the increase in the years following K3 adoption is reasonable given that property, plant and equipment represents the core asset of TOAs. As a result, we would expect that TOAs with a high ambition in terms of transparency not only wish to have a generally high level of voluntary disclosure, but also a high level of disclosure specifically related to their depreciation of parts.

Our findings regarding harmonization related to the disclosure of depreciation of parts on the other hand support a statistically significant improvement over time, in line with our expectations and in support of previous research (Jones, Finley 2011). While the application and disclosure of depreciation of parts is up to each TOA's individual judgements, we argue that the leeway under old Swedish GAAP related to depreciation as a whole has been suppressed following K3 adoption. This in turn would be logical since old Swedish GAAP allowed for a variety of depreciation methods while K3 only permits depreciation of parts.

Therefore, the K3-framework has been advantageous from a comparability perspective since K3-TOAs are now more aligned when disclosing information related to their core assets. Furthermore, we argue that this has increased the usefulness of accounting information, and especially for people with limited accounting knowledge. The improvement in harmonization related to depreciation of parts would also support SOU's (2017, p. 20) proposition that all TOAs, regardless of adopting K2 or K3, should use depreciation of parts.

Capitalization of investments

While the improvement in the capitalization of investments (*Cap_rate*) significantly increased between pre-K3 and post-K3, we find no statistically significant increase in the capitalization of investments as a result of K3 adoption, when controlling for the upward rising trend. At the same time, we find no statistically significant support for an improvement in harmonization across TOAs' capitalization of investments. Given that 72% of the TOAs in our sample were built between 1960 and 1980, a potential explanation for the continuously increasing trend in capitalization of investments could be that these TOAs are now entering a time period with large investment needs. For example, the replacement cycle for the plumbing and drain system is usually considered to be approximately 50 years. This often represents one of the largest capital expenditures for a TOA, and it would therefore stand to reason that the capitalization of investments should increase. Should the K2-framework have been applied instead, the capitalization of aforementioned investments would not have been allowed (section 2.2). As reasoned in section 2.2.1 and argued by Hellman et al. (2011), capitalization of such major investments would represent an accounting treatment that more closely resembles true economic values. As such, even though we find no statistically significant differences between old Swedish GAAP and K3, we argue that the K3-framework offers a more relevant accounting treatment of assets than the K2-framework.

The K3-framework and TOAs

Given the statistically significant improvement in general voluntary disclosure (*Discl_index*) related to K3 adoption, the harmonization of general voluntary disclosure at the time of K3 adoption as well as the harmonization of disclosure related to TOAs' depreciation of parts (*Dep_method_class*), we argue that the implementation of the K3-framework has led to an improvement in financial reporting quality and harmonization among TOAs. Consequently, we claim that the implementation of the K3-framework has successfully improved financial reporting compared to old Swedish GAAP. We therefore contribute to previous literature

regarding the voluntary transition from national GAAP to IFRS-based standards, as well as related to the implementation of IFRS for SMEs-derived frameworks.

Previous theory has documented a perceived belief that the benefits of IFRS for SMEs do not outweigh the criticism (Perera, Chand 2015, Quagli, Paoloni 2012). However, we argue, supported by our results, that the improvement in financial reporting following the adoption of an IFRS for SMEs-derived framework is substantial. Furthermore, the main critique of IFRS for SMEs concerns a lack of addressing the main users, argued to be banks and tax authorities, instead of investors (Quagli, Paoloni 2012). We contribute to previous research by being able to study the implementation of the IFRS for SMEs-derived K3-framework in a setting, where the main users are apartment buyers, i.e. investors, since there is an active market for trading the ownership of the rights to use apartments. As a result, The K3-framework could therefore in reality be more suited for TOAs than for non-listed SMEs. This would in turn contradict some of the critique brought forward by SOU (2017, p. 153), that the K3-framework is not customized for TOAs' unique attributes. The reason being that the framework is in theory well-aligned with TOAs' operating characteristics and primary users (apartment buyers and tenant-owners) of financial information.

7.1.2 Apartment buyers' lack of usage of unfiltered information and the inefficient market for tenant-owned apartments

Below, we discuss our findings related to apartment pricing (section 6.3) by connecting our results with our theoretical valuation model in section 2.3 as well as our reasoning in sections 3.2.2 and 4.2. This is done to examine the second purpose of our thesis, how the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments.

Our findings indicate that the financial performance of TOAs is reflected in tenant-owned apartment prices, while the financial position of TOAs is not fully reflected. While the magnitude of the negative coefficient regarding $OPEX$ (*Assfee_LessIntExp_sqm*) is statistically significant and reasonable, the effect does not have a major impact on tenant-owned apartment prices. For example, for a tenant-owned apartment constituting 50 square meters, an increase in $OPEX$ of 100 SEK/sqm would result in a total cost increase of 5,000 SEK per year. However, the corresponding price decrease of the apartment would only be 27,250 SEK. Given that average $OPEX$ in our sample is 563 SEK/sqm, the increase in $OPEX$ of 100 SEK/sqm would

require a 17.8% increase in association fees to cover the increased costs, all else equal. At the same time, the average price per square meter in our sample of 31,923 SEK/sqm would value the apartment at 1.6 SEKm, having the price decline of 27,250 SEK only represent a 1.7% decrease in apartment value[8].

Additionally, we find that ND_{sqm} (*Netdebt_sqm*) does not impact apartment prices to the full extent as it theoretically should. Given that the negative one-to-one relationship between ND_{sqm} and apartment price per square meter is statistically rejected on a 1% level (being only -0.2), we argue that the market is not efficient for our sample. A coefficient different from -1.0 would violate underlying valuation theory regarding equity and enterprise value.

In line with previous theory regarding private investors' usage of filtered information (Elliott et al. 2008), we contribute to previous literature by documenting a lack of usage of unfiltered information among non-professional private investors. In addition to the previous proposal by SOU (2017, p. 316), that real estate agents should be required to disclose the tenant-owner's share of the TOA's net debt in the apartment prospectus, we argue that there is a need for further regulation in this area. By making it mandatory for real estate agents to report both price per square meter and price per square meter adjusted for the tenant-owner's share of the TOA's net debt, the link between price and net debt would be clarified. This would result in a larger amount of filtered information presented to investors which, in line with Elliott et al. (2008), would facilitate the usage of financial information for non-professional investors. As such, we argue that an increase in filtered information in the Swedish housing market should result in a more efficient market.

Furthermore, while we cannot draw any conclusions from our sample to the entire population of TOAs, since the sample is not randomly selected, the lack of impact from net debt could have several considerable negative consequences for the housing market. For example, there are short-term incentives for the BoDs of TOAs to keep association fees low and finance any potential deficit with debt. In an extreme scenario, TOAs could take on large amounts of debt,

[8] Even though the purpose of this thesis is not to examine the cost of capital for tenant-owners, an implicit WACC could be calculated using the link between price per square meter (*price_sqm*) and association fees less interest expenses per square meter (*Assfee_LessIntExp_sqm*). Assuming that an increase in *OPEX* would be perpetual and with zero growth, the Gordon growth formula would yield a discount rate of 18.3% (100/545). For valuing a real estate asset (with low operating risk), the discount rate seems high in relation to current market conditions.

distribute the capital to their existing tenant-owners, without the corresponding decline in apartment prices. This would represent an arbitrage opportunity for the current tenant-owners at the expense of future owners. Furthermore, if the same relationship would hold for the entire population of TOAs, a real estate developer could, when building and forming a new TOA, take on large amounts of debt without seeing a proportionate decrease in the TOA's final apartment prices. This in turn would result in higher profits for real estate developers at the expense of future tenant-owners. Additionally, since apartment buyers do not fully take into account the effect of TOAs' net debt, there is a risk of double leverage (as both the TOA and the tenant-owner could raise debt with the apartment as collateral) where more than 100% of the underlying asset value would be debt-financed. In a setting different from today's low-interest rate environment, this could have significant consequences for tenant-owners because of the higher personal interest expenses paid, and the potential increase in TOAs' association fees.

To conclude, we argue that more filtered information, such as KPIs and specific disclosure of price per square meter adjusted for the tenant-owner's share of the TOA's net debt, in the Swedish housing market are needed in order to facilitate the usage of accounting information among tenant-owners and apartment buyers. This would be in line with both previous theory (Elliott et al. 2008) and the proposals by SOU (2017, pp. 154 & 316). Furthermore, increased requirements should be put on real estate agents. Similar to investment advisors in the capital markets industry, real estate agents often represent the main point of contact for investors/apartment buyers and should therefore also have more stringent requirements when it comes to disclosure and explanation of TOAs' financial information.

7.2 Limitations

Due to the lack of available financial data for TOAs, as well as the high degree of manual work required (see section 5.3), only the 100 largest Swedish TOAs adopting the K3-framework were chosen for this study. The size ranking was based on the number of apartments reported to Swedish government agency Lantmäteriet. As mentioned in section 2.1, there are approximately 25,000 active TOAs in Sweden. Thus, the 100 largest TOAs cannot be classified as a statistically representative, random sample for the entire population. The reasoning behind our non-randomized sample selection is the increased likelihood of finding TOAs adopting the K3-framework among larger associations. Furthermore, we argue that this sample is still viable

due to the large proportion of the population living in said larger associations. For example, as seen in section 6.1.1, our sample covers 55,357 apartments. Thus, while only covering 0.4% of all TOAs, our sample covers 5.0% of all tenant-owned apartments. Additionally, larger associations often have staff employed and/or financial administrators that can provide access to the annual reports. As previously mentioned in sections 3.2.1 and 3.2.2, we believe that our sample of large TOAs with a high ambition regarding their accounting practices and transparency provides an optimal setting in order to examine both the K3-framework's effect on financial reporting quality and financial reporting harmonization, as well as how financial information is reflected in the pricing of tenant-owned apartments.

Given that 82 out of 100 TOAs in our sample are members of the larger Swedish association HSB, we acknowledge that HSB may have influenced the accounting policy choices of its members on a regional and/or national level. Additionally, due to the limitations of our manual data collection process, our event window only covers the time period 2010-2016. As such, we can only observe events occurring in a low-interest rate environment.

Furthermore, when assessing the robustness of our findings by examining the results across time periods, we find that the results are not robust when testing pre-K3 (2010-2013) and post-K3 (2014-2016) separately, as seen in Appendix I. Given that this is the first study on the link between TOAs' financial information and the valuation of their tenant-owned apartments, we see a need for further research over longer time periods and across larger samples.

Finally, the variable *region_price_sqm* represents the average price level in a region for a specific time period. However, the transactions included in the index are also linked to TOAs outside our sample with financial factors we cannot control for. As such, regional price levels could be affected by differing financial performance and position of TOAs across regions and months.

8. Final remarks and suggestions for future research

The purpose of this thesis is to (1) analyze the potential effects on financial reporting quality and financial reporting harmonization following TOAs' adoption of the K3-framework and (2) examine how the financial performance and position of TOAs are reflected in the pricing of tenant-owned apartments. We study these topics by using accounting and financial information hand-collected from 600 annual reports from the 100 largest Swedish TOAs adopting the K3-framework over the period 2010-2016. The data is then complemented with 22,268 apartment transactions occurring within these TOAs. We believe that our sample of large and ambitious TOAs provides an optimal setting in order to examine both the potential effects on financial reporting quality (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006) and harmonization (Jones, Finley 2011) following K3 adoption. Furthermore, this should result in a high level of transparency and conveyance of private information. Consequently, we also believe that this should facilitate the usage of financial information for potential apartment buyers, and therefore provide an ideal setting for examining the connection between TOAs' financial performance and position and the value of their tenant-owned apartments. We analyze disclosure-related factors and capitalization of investments to test for financial reporting quality and financial reporting harmonization. We then present a theoretical valuation model for tenant-owned apartments and run fixed effects regression models to test for the effect of TOAs' financial performance and position on their tenant-owned apartment prices.

In line with previous research (de La Bruslerie, Gabteni 2014, Daske, Gebhardt 2006), we find that financial reporting quality, in terms of general voluntary disclosure, has improved as a result of the adoption of an IFRS-based framework, in our case the K3-framework. The increase in the capitalization of investments could be attributed to an upward-rising trend due to TOAs in our sample entering a period of large investment needs. Disclosure related to TOAs' depreciation of parts on the other hand exhibited a statistically significant decline at the time of K3 adoption, but then increased to above pre-K3 levels. In terms of harmonization, we find that the harmonization of general voluntary disclosure only increased at the time of K3 adoption. Looking instead at the harmonization of disclosure related to TOAs' depreciation of parts, we find an increase both at the time of K3 adoption and over time. This would support previous theory (Jones, Finley 2011) regarding an increase in within-country harmonization following the adoption of an IFRS-based framework, in our case the K3-framework.

Consequently, we argue that the implementation of the K3-framework has successfully improved financial reporting when transitioning from old Swedish GAAP.

Looking at the valuation of tenant-owned apartments, our results show that three non-financial factors (regional price per square meter during the month of the transaction, number of rooms and apartment story) and two financial factors (association fees less interest expenses per square meter and net debt per square meter) have a statistically significant impact on apartment prices. However, we find that net debt exhibits only a -0.22 relationship to apartment prices instead of the one-to-one relationship it theoretically should. As a result, we conclude that apartment buyers of tenant-owned apartments are not rational and that the market for tenant-owned apartments is inefficient. This since we find that buyers take into account the financial performance, but not the full extent of TOAs' financial position, when valuing tenant-owned apartments. The lack of usage of unfiltered information among non-professional private investors, in our case apartment buyers, is in line with previous theory (Elliott et al. 2008) and supports the proposals by SOU (2017, pp. 154 & 316).

We contribute to previous research in several aspects. First, by being able to study the implementation of the IFRS for SMEs-derived K3-framework in its intended setting, where the main users are apartment buyers, i.e. investors. Second, we contribute to previous literature regarding the voluntary transition from national GAAP to IFRS-based standards, as well as related to the implementation of IFRS for SMEs-derived frameworks. Third, in line with previous theory regarding private investors' usage of filtered information, we contribute to previous literature by documenting a lack of usage of unfiltered information among non-professional private investors.

Our study encounters certain limitations due to the high involvement of hand-collected data. Only the 100 largest Swedish TOAs adopting the K3-framework were chosen, and therefore did not represent a random sample. The influence of the Swedish association HSB was also present, with 82 of the 100 TOAs being members. Additionally, our event window only covers the time period 2010-2016. As such, we can only observe events occurring in a low-interest rate environment. Finally, the variable *region_price_sqm* represents the average price level of tenant-owned apartments in a region for a specific month. However, the transactions included in the index are also linked to TOAs outside of our sample with financial factors we cannot

control for. As such, regional price levels could be affected by differing financial performance and position of TOAs across regions and months.

In terms of future research, we see several possibilities to increase knowledge within this field, especially since this is the first study on the link between TOAs' financial information and the valuation of tenant-owned apartments. It would be of interest to examine differences and similarities between TOAs adopting the K2- and K3-framework. Additionally, we also find that the financial factors in our valuation model prove not to be robust when testing pre-K3 (2010-2013) and post-K3 (2014-2016) separately. As a result, we see a need for further research over longer time periods and across larger samples. This would also be interesting since we have only studied TOAs in a low-interest rate environment, which means that a study across a longer time period would deepen insights into interest rate effects on TOAs.

9. References

Aisbitt, S. 2001, "Measurement of harmony of financial reporting within and between countries: the case of the Nordic countries", *European Accounting Review*, vol. 10, no. 1, pp. 51-72.

Archer, S., Delvaille, P. & McLeay, S. 1995, "The Measurement of Harmonisation and the Comparability of Financial Statement Items: Within-Country and Between-Country Effects", *Accounting and Business Research*, vol. 25, no. 98, pp. 67-80.

Armitage, P.G. & Matthews, J. 2002, *Statistical Methods in Medical Research*, 4th edn, Blackwell, Oxford.

Årsredovisningslag (ÅRL) 1995, *Årsredovisningslag (1995:1554)*, The Government of Sweden, Swedish Law, Stockholm.

Ball, R. 2006, "International financial reporting standards (IFRS): Pros and cons for investors", *Accounting and Business Research*, vol. 36, no. SPEC. ISS, pp. 5-27.

Barker, R.G. 1999, "The role of dividends in valuation models used by analysts and fund managers", *European Accounting Review*, vol. 8, no. 2, pp. 195-218.

Barker, R.G. 1998, "The market for information - Evidence from finance directors, analysts and fund managers", *Accounting and Business Research*, vol. 29, no. 1, pp. 3-20.

Barth, M.E., Landsman, W.R., Lang, M. & Williams, C. 2012, "Are IFRS-based and US GAAP-based accounting amounts comparable?", *Journal of Accounting and Economics*, vol. 54, no. 1, pp. 68-93.

Barth, M.E., Landsman, W.R. & Lang, M.H. 2008, "International accounting standards and accounting quality", *Journal of Accounting Research*, vol. 46, no. 3, pp. 467-498.

BFN 2017, 12/21/2017-last update, *K-projektet* [Homepage of Swedish Accounting Standards Board "Bokföringsnämnden, BFN"], [Online]. Available: http://www.bfn.se/sv/om-bokforingsnamnden/k-projektet [2018, 05/06].

BFNAR 2001:3 2001, Swedish Accounting Standards Board "Bokföringsnämnden, BFN", Swedish GAAP, Stockholm.

BFNAR 2006:1 2006, Swedish Accounting Standards Board "Bokföringsnämnden, BFN", Swedish GAAP, Stockholm.

BFNAR 2010:1 2010, Swedish Accounting Standards Board "Bokföringsnämnden, BFN", Swedish GAAP, Stockholm.

BFNAR 2012:1 2012, Swedish Accounting Standards Board “Bokföringsnämnden, BFN”, Swedish GAAP, Stockholm.

BFNAR 2016:10 2016, Swedish Accounting Standards Board “Bokföringsnämnden, BFN”, Swedish GAAP, Stockholm.

Bhattacharya, S. & Chiesa, G. 1995, "Proprietary information, financial intermediation, and research incentives", *Journal of Financial Intermediation,* vol. 4, no. 4, pp. 328-357.

Bokföringslag (BFL) 1999, *Bokföringslag (1999:1078),* The Government of Sweden, Swedish Law, Stockholm.

Bostadsrättslag (BRL) 1991, *Bostadsrättslag (1991:614),* The Government of Sweden, Swedish Law, Stockholm.

Brown, M.B. & Forsythe, A.B. 1974, "Robust tests for the equality of variances", *Journal of the American Statistical Association,* vol. 69, no. 346, pp. 364-367.

Brüggemann, U., Hitz, J.-. & Sellhorn, T. 2013, "Intended and Unintended Consequences of Mandatory IFRS Adoption: A Review of Extant Evidence and Suggestions for Future Research", *European Accounting Review,* vol. 22, no. 1, pp. 1-37.

Canning, J.B. 1929, *The economics of accountancy: a critical analysis of accounting theory,* 1st edn, Ronald Press Company, cop., New York.

Cascino, S., Mark, C., Beatriz, G.O., Joachim, G., Shahed, I. & Thomas, J. 2014, "Who Uses Financial Reports and for What Purpose? Evidence from Capital Providers", *Accounting in Europe,* vol. 11, no. 2, pp. 185-209.

Cascino, S. & Gassen, J. 2015, "What drives the comparability effect of mandatory IFRS adoption?", *Review of Accounting Studies,* vol. 20, no. 1, pp. 242-282.

Castellum 2010, 11/29/10-last update, *Castellum AB:s remissvar avseende Bokföringsnämndens vägledning ”upprättande av årsredovisning (K3)* [Homepage of Swedish Accounting Standards Board “Bokföringsnämnden, BFN”], [Online]. Available: http://www.bfn.se/upload/sv/om-bokforingsnamnden/vara-remisser/inkomna-remissvar/Upprättande%20av%20årsredovisning%20(K3%20med%20komplettering)/castellum-remissvar.pdf [2018, 04/17/18].

Cooke, T.E. 1989, "Voluntary Corporate Disclosure by Swedish Companies", *Journal of International Financial Management & Accounting,* vol. 1, no. 2, pp. 171-195.

Daske, H. & Gebhardt, G. 2006, "International financial reporting standards and experts' perceptions of disclosure quality", *Abacus,* vol. 42, no. 3-4, pp. 461-498.

Dagens Nyheter. 2016, *Kolla upp föreningens ekonomi före köp,* 06/20, Wolodarski, P., Stockholm.

de La Bruslerie, H. & Gabteni, H. 2014, "Voluntary disclosure of financial information by French firms: Does the introduction of IFRS matter?", *Advances in Accounting,* vol. 30, no. 2, pp. 367-380.

Elliott, W.B., Hodge, F.D. & Jackson, K.E. 2008, "The association between nonprofessional investors' information choices and their portfolio returns: The importance of investing experience", *Contemporary Accounting Research,* vol. 25, no. 2, pp. 473-498.

FAR 2010, 12/3/10-last upda*te, Bokföringsnämndens vägledning: Upprättande av årsredovisning (K3*) [Homepage of Swedish Accounting Standards Board "Bokföringsnämnden, BFN"], [Online]. Available: http://www.bfn.se/upload/sv/om-bokforingsnamnden/vara-remisser/inkomna-remissvar/Upprättande%20av%20årsredovisning%20(K3%20med%20komplettering)/Far-remissvar.pdf [2018, 04/17/18].

Francis, J., Nanda, D. & Olsson, P. 2008, "Voluntary disclosure, earnings quality, and cost of capital", *Journal of Accounting Research,* vol. 46, no. 1, pp. 53-99.

Gassen, J. 2017, "The effect of IFRS for SMEs on the financial reporting environment of private firms: an exploratory interview study", *Accounting and Business Research,* vol. 47, no. 5, pp. 540-563.

Hausman, J.A. 1978, "Specification tests in econometrics", *Econometrica,* vol. 46, pp. 1251-1271.

Hellman, N., Nordlund, B. & Pramhäll, C. 2011, *Förbättrad redovisning med komponentansats: Nyttan överstiger kostnaderna*, Balans 2011 no. 12, FAR, Stockholm.

Hellman, N., Gray, S.J., Morris, R.D. & Haller, A. 2015, "The persistence of international accounting differences as measured on transition to IFRS", *Accounting and Business Research,* vol. 45, no. 2, pp. 166-195.

Hitz, J.-. 2007, "The decision usefulness of fair value accounting - A theoretical perspective", *European Accounting Review,* vol. 16, no. 2, pp. 323-362.

Holland, J.B. 1999, "Financial reporting, private disclosure and the corporate governance role of financial institutions", *Journal of Management and Governance,* vol. 3, no. 2, pp. 161-187.

Holland, J.B. 1998, "Private disclosure and financial reporting", *Accounting and Business Research,* vol. 28, no. 4, pp. 255-269.

IAS 16 2014, *IAS 16, Property Plant and Equipmen*t, International Accounting Standards Board (IASB), International GAAP, London.

IFRS for SMEs 2015, *International Financial Reporting Standard for Small and Medium-sized Entities (IFRS for SMEs*), International Accounting Standards Board (IASB), International GAAP, London.

Imam, S., Barker, R. & Clubb, C. 2008, "The use of valuation models by UK investment analysts", *European Accounting Review,* vol. 17, no. 3, pp. 503-535.

Inkomstskattelag (IL) 1999, *Inkomstskattelag (1999:1229*), The Government of Sweden, Swedish Law, Stockholm.

Jones, S. & Finley, A. 2011, "Have IFRS made a difference to intra-country financial reporting diversity?", *British Accounting Review,* vol. 43, no. 1, pp. 22-38.

Kaya, D. & Koch, M. 2015, "Countries adoption of the International Financial Reporting Standard for Small and Medium-sized Entities (IFRS for SMEs) - Early empirical evidence", *Accounting and Business Research,* vol. 45, no. 1, pp. 93-120.

Koller, T. & Goedhart, M. 2015, *Valuation: Measuring and Managing the Value of Companies, University Edition,* 6th edn, WILEY.

Kvaal, E. & Nobes, C. 2012, "IFRS Policy Changes and the Continuation of National Patterns of IFRS Practice", *European Accounting Review,* vol. 21, no. 2, pp. 343-371.

Kvaal, E. & Nobes, C. 2010, "International differences in IFRS policy choice: A research note", *Accounting and Business Research,* vol. 40, no. 2, pp. 173-187.

Lardon, A. & Deloof, M. 2014, "Financial disclosure by SMEs listed on a semi-regulated market: evidence from the Euronext Free Market", *Small Business Economics,* vol. 42, no. 2, pp. 361-385.

Lee, T.A. & Tweedie, D.P. 1975, "Accounting Information: An Investigation of Private Shareholder Usage", *Accounting and Business Research,* vol. 5, no. 20, pp. 280-291.

Levene, H. 1960, *Contributions to Probability and Statistics: Essays in Honor of Harold Hotelling,* 1st edn, Stanford University Press., Menlo Park, CA.

Liao, Q., Sellhorn, T. & Skaife, H.A. 2012, "The cross-country comparability of IFRS earnings and book values: Evidence from France and Germany", *Journal of International Accounting Research,* vol. 11, no. 1, pp. 155-184.

Marton, J. 2017, "The Role and Current Status of IFRS in the Completion of National Accounting Rules–Evidence from Sweden", *Accounting in Europe,* vol. 14, no. 1-2, pp. 207-216.

Nobes, C. 2013, "The continued survival of international differences under IFRS", *Accounting and Business Research,* vol. 43, no. 2, pp. 83-111.

Nobes, C. 2011, "IFRS Practices and the Persistence of Accounting System Classification", *Abacus,* vol. 47, no. 3, pp. 267-283.

Olbert, L. 1994, "Stock valuation methods of financial analysts in a thin stock market in Sweden, with comparisons to the United Kingdom and the United States", *International Journal of Accounting,* vol. 29, no. 2, pp. 123-135.

Paananen, M., Renders, A. & Blomkvist, M. 2016, "Causes and Consequences of Improvements in the Information Environment for Swedish Small and Mid-Sized Firms", *Accounting in Europe,* vol. 13, no. 1, pp. 21-42.

Perera, D. & Chand, P. 2015, "Issues in the adoption of international financial reporting standards (IFRS) for small and medium-sized enterprises (SMES)", *Advances in Accounting,* vol. 31, no. 1, pp. 165-178.

Quagli, A. & Paoloni, P. 2012, "How is the IFRS for SME accepted in the European context? An analysis of the homogeneity among European countries, users and preparers in the European commission questionnaire", *Advances in Accounting, incorporating Advances in International Accounting,* vol. 28, pp. 147-156.

RFR 2018, 01/12/2018-last update, *Rådet för finansiell rapportering* [Homepage of Rådet för finansiell rapportering (RFR)], [Online]. Available: http://www.radetforfinansiellrapportering.se/ [2018, 05/06].

Royston, P. 1992, *Statistics and Computing 2,* 2nd edn,.

SBC 2018, *Sveriges Bostadsrättsrapport 2018*, 1st edn, SBC, Stockholm.

SCB Statistikdatabasen 2017, *Bostadsbeståndet*

SCB Statistikdatabasen 2018a, *Finansmarknadsstatistik*

SCB Statistikdatabasen 2018b, *Konsumentprisindex*

Statens offentliga utredningar (SOU) 2014, *2014:22*, Justitiedepartementet, Stockholm.

Statens offentliga utredningar (SOU) 2017, *2017:31*, Justitiedepartementet, Stockholm.

SABO 2013, *Komponentredovisning av fastigheter*, 1st edn, Swedish Association of Public Housing Companies (SABO), Stockholm.

Swedish Central Bank 2017, 05/24/2017-last update, *Bostadspriser och hushållens skuldsättning – den främsta risken* [Homepage of Swedish Central Bank], [Online]. Available: https://www.riksbank.se/sv/press-och-publicerat/nyheter-och-pressmeddelanden/pressmeddelanden/2017/bostadspriser-och-hushallens-skuldsattning--den-framsta-risken/ [2018, 04/17/18].

Swedish Financial Supervisory Authority 2018, 03/02/2018-last update, *Om hushållens skulder* [Homepage of Swedish Financial Supervisory Authority], [Online]. Available: https://www.fi.se/sv/finansiell-stabilitet/hushallens-skulder/om-hushallens-skulder/ [2018, 05/06].

Swedish Financial Supervisory Authority 2017, 11/13/2017-last update, *FI föreslår skärpt amorteringskrav* [Homepage of Swedish Financial Supervisory Authority], [Online]. Available: www.fi.se/sv/publicerat/pressmeddelanden/2017/fi-foreslar-skarpt-amorteringskrav/ [2018, 05/06].

Swedish Financial Supervisory Authority 2016, 04/20/2016-last update, *Amorteringskrav på nya bolån* [Homepage of Swedish Financial Supervisory Authority], [Online]. Available: www.fi.se/sv/publicerat/pressmeddelanden/2016/amorteringskrav-pa-nya-bolan/ [2018, 05/06].

Valueguard 2018, 05/06/2018-last update, *HOX Index* [Homepage of Valueguard], [Online]. Available: www.valueguard.se/indexes [2018, 05/06].

Yip, R.W.Y. & Young, D. 2012, "Does mandatory IFRS adoption improve information comparability?", *Accounting Review*, vol. 87, no. 5, pp. 1767-1789.

10. Appendixes

Appendix A – Specifications regarding the illustrative example between depreciation methods

Asset classified into parts	Value	Share of total asset value	Useful life (years)	Depreciation expense
Part A	3,750	25%	100.0	37.5
Part B	9,750	65%	50.0	195.0
Part C	750	5%	33.3	22.5
Part D	750	5%	16.7	45.0
Total	**15,000**	**100%**		**300**

Appendix B – Example of tenant-owned apartment valuation

In this Appendix, an illustrative valuation example is presented using the theoretical valuation model proposed in section 2.3. Assume a tenant-owned apartment situated in a TOA with the following predicted future financials:

Income statement (SEK/sqm)	**20X1**	**20X2**	**20X3 and onwards**
Association fees	600	600	600
Other revenue	50	50	50
Total revenue	**650**	**650**	**650**
Operating expenses (excl. depreciation)	-480	-455	-460
Depreciation expenses	-100	-125	-130
Operating profit	**70**	**70**	**60**
Net interest expenses	-60	-60	-60
Net income	**10**	**10**	**0**

Furthermore, assume that capital expenditures equal 200 for 20X1, 50 for 20X2 and equal to depreciation expenses (130 SEK/sqm) for 20X3 and onwards. The changes in net working capital from 20X1 and onwards are 0. The current market value of net debt is equal to 2,000 SEK/sqm. Additionally, assume that there is an identical apartment in the rental market that can be rented for 4,000 SEK/sqm per year from 20X1 and onwards. This rental expense represents the alternative income ($R_{Renting}$) presented in section 2.3. According to formula 2, the cash flows related to owning an apartment is calculated as:

$$CF_{Owning_t} = OPEX_t - Dep_t - NI_t - Other\ revenue_t + CAPEX_t + \Delta NWC_t$$

Where,

$OPEX_t = AF_t - I_t$

As such, for the year 20X1, $CF_{Owning_{20X1}}$ can be calculated as:

$$CF_{Owning_{20X1}} = (600 - 60) - 100 - 10 - 50 + 200 + 0 = 580\ SEK/sqm$$

Recall that according to formula 3, the alternative free cash flows can be calculated as:

$$AFCF_t = R_{Renting_t} - CF_{Owning_t}$$

As such, for the year 20X1, $AFCF_{20X1}$ can be calculated as:

$$AFCF_{20X1} = 4{,}000 - 580 = 3{,}420\ SEK/sqm$$

The table below includes the calculated values for all years:

Cash flow projections (SEK/sqm)	**20X1**	**20X2**	**20X3 and onwards**
$OPEX_t$	540	540	540
CF_{Owning_t}	580	405	490
$R_{Renting_t}$	4,000	4,000	4,000
$\boldsymbol{AFCF_t}$	**3,420**	**3,595**	**3,510**

According to formula 4, EV_{sqm_o} can be calculated as:

$$EV_{sqm_o} = \sum_{t=1}^{T} \frac{AFCF_t}{(1+WACC)^t}$$

The enterprise value of the apartment, assuming a WACC of 8% and using the Gordon growth formula[9,10], then becomes:

$$EV_{sqm_o} = \frac{3{,}420}{(1+8\%)} + \frac{3{,}595}{(1+8\%)^2} + \frac{\left(\frac{3{,}510}{8\%}\right)}{(1+8\%)^2} = 43{,}865\ SEK/sqm$$

As a result, the equity value of the apartment per square meter is:

$$MV(E)_{sqm_o} = EV_{sqm_o} - ND_{sqm_0} = 43{,}865 - 2{,}000 = 41{,}865\ SEK/sqm$$

To conclude, the theoretical price per square meter of the tenant-owned apartment should be 41,865 SEK/sqm.

[9] $EV_0 = \frac{AFCF_0(1+g)}{(1+WACC)} + \frac{AFCF_0(1+g)^2}{(1+WACC)^2} + \cdots + \frac{AFCF_0(1+g)^t}{(1+WACC)^t} + \cdots = \frac{AFCF_0(1+g)}{WACC-g} = \frac{AFCF_1}{WACC-g}$
Where,
g: annual growth rate of $AFCF$

[10] Assuming zero growth in perpetuity (g = 0)

Appendix C – Explanation and criteria of classification regarding the voluntary disclosure related to the depreciation of parts method

Classification criteria for test variable Dep_method_class	
Value	**Criteria**
0	Non-compliant. Does not use depreciation of parts.
1	Compliant. Uses depreciation of parts. Does not specify parts nor depreciation time (years) per part.
2	Compliant. Uses depreciation of parts. Does not specify parts nor depreciation time (years) per part. However, specifies some additional information such as average depreciation per PPE segment.
3	Compliant. Uses depreciation of parts. Specifies parts but not depreciation time (years) per part, OR specifies depreciation time (years) but not specific parts.
4	Compliant. Uses depreciation of parts. Specifies both parts and depreciation time (years) per part.

Notes: The table presents the classification criteria used when assessing TOAs' level of voluntary disclosure related to their depreciation of parts method. A higher value indicates a higher level of voluntary disclosure.

Appendix D – List of tenant-owner associations included in the sample, ranked by size (of all TOAs, not excluding K2-adopters)

Rank	Name	Registration no.	Apts	Area (sqm)	Registration date	Postal City	City District
1	BOSTADSRÄTTSFÖRENINGEN MASTHUGGET	716408-5370	1,171	84,929	11/26/1979	Göteborg	Majorna-Linné
2	HSB Bostadsrättsförening Bosvedjan i Sundsvall	789200-2796	1,033	81,185	10/23/1969	Sundsvall	.
3	BOSTADSRÄTTSFÖRENINGEN KUNGSKLIPPAN I STOCKHOLM	702001-2253	1,030	40,301	3/3/1934	Stockholm	Kungsholmen
4	HSB Bostadsrättsförening Högaholm i Malmö	746001-0395	994	73,438	9/30/1968	Malmö	Fosie-Oxie
5	HSB BOSTADSRÄTTSFÖRENING BACKADALEN I GÖTEBORG	757200-9442	971	69,008	2/2/1966	Hisings Backa	Norra Hisingen
6	HSB Bostadsrättsförening Väduren i Haninge	712400-2192	911	63,960	1/19/1968	Brandbergen	.
7	HSB BOSTADSRÄTTSFÖRENING CITY I TÄBY	716000-0134	900	65,475	11/15/1952	Täby	.
10	BRF FARMEN I TÄBY	716000-0209	866	75,018	2/21/1964	Täby	.
11	HSB Bostadsrättsförening Jupiter 1 i Täby	716000-0449	844	63,244	6/25/1962	Täby	.
13	HSB Bostadsrättsförening 53 Gräslöken i Uppsala	717600-7644	832	58,602	11/25/1968	Uppsala	.
14	HSB Bostadsrättsförening Volten i Täby	716000-1066	828	71,062	12/3/1964	Täby	.
15	HSB Bostadsrättsförening Tibble i Upplands-Bro	717000-2427	825	65,406	6/20/1968	Kungsängen	.
17	HSB Bostadsrättsförening Fredhäll i Stockholm	702000-6305	788	31,761	5/2/1931	Stockholm	Kungsholmen
18	HSB BOSTADSRÄTTSFÖRENING VILBERGEN I NORRKÖPING	725000-4707	786	52,393	7/18/2001	Norrköping	.
19	HSB Bostadsrättsförening Hilda i Malmö	746001-0163	768	59,934	11/30/1966	Malmö	Rosengård-Husie
21	HSB Bostadsrättsförening Pampas i Solna	715200-1181	746	49,920	12/28/1959	Solna	.
22	HSB:S BOSTADSRÄTTSFÖRENING HÖGDALEN I STOCKHOL	702000-9572	742	42,574	10/17/1953	Bandhagen	Farsta-Vantör
24	HSB Bostadsrättsförening Tanto i Stockholm	716416-7483	729	53,381	1/14/1980	Stockholm	Södermalm
26	BOSTADSRÄTTSFÖRENINGEN SELÅNGERHUS NR 4	789200-4115	718	54,654	9/28/1964	Sundsvall	.
27	BOSTADSRÄTTSFÖRENINGEN SOLHJULET	714800-1675	704	47,995	7/1/1959	Sollentuna	.
29	HSB BOSTADSRÄTTSFÖRENING VENUS I TÄBY	716000-1009	703	57,755	10/3/1960	Täby	.
32	HSB Bostadsrättsföreningen Päronet nr 7 i Stockholm	702001-7344	676	51,369	2/27/1965	Kista	Spånga-Kista
33	HSB:S BRF RÅGEN I SUNDSVALL 2067	789200-5914	673	45,512	3/3/1970	Sundsvall	.
37	BOSTADSRÄTTSFÖRENINGEN MÄSSEN I STOCKHOLM	702001-5017	642	26,398	2/27/1932	Stockholm	Östermalm
38	HSB Bostadsrättsförening Loke i Haninge	712400-0881	640	54,296	3/6/1964	Handen	.
40	HSB Bostadsrättsförening Kantarellen 11	769607-5857	626	44,767	10/3/2001	Lidingö	.
41	HSB Bostadsrättsförening Kalkonen i Stockholm	702001-0653	611	23,491	3/13/1926	Stockholm	Kungsholmen
42	HSB Bostadsrättsförening Sjötungan i Tyresö	712400-1467	609	50,664	1/30/1965	Tyresö	.
43	HSB Bostadsrättsförening Skärsätra i Lidingö	713600-0572	605	43,639	4/9/1960	Lidingö	.

Rank	Name	Registration no.	Apts	Area (sqm)	Registration date	Postal City	City District
44	HSB Bostadsrättsförening Söderkulla i Malmö	746000-5213	596	47,578	1/30/1960	Malmö	Hyllie
47	HSB Bostadsrättsförening Tellus i Haninge	712400-2184	586	38,002	1/19/1968	Haninge	.
48	BOSTADSRÄTTSFÖRENINGEN PLATÅN	714800-1352	583	43,257	4/19/1960	Sollentuna	.
49	HSB:S BRF BLÅSUT I GÖTEBORG	757200-9285	578	41,861	8/31/1962	Göteborg	Majorna-Linné
50	HSB Bostadsrättsförening Skogslyckan i Västerås	778000-3344	576	34,988	1/2/1956	Västerås	.
56	HSB Bostadsrättsförening Vikingen i Kista	702002-8218	553	39,453	11/5/1970	Kista	Spånga-Kista
57	BRF BRICKBANDET	702000-2619	553	28,742	6/16/1943	Bromma	Bromma-Västerled
58	Bostadsrättsföreningen Stockholmshus 8	702002-1726	550	26,319	3/22/1944	Årsta	Enskede-Skarpnäc
59	HSB Bostadsrättsförening Bandhagen i Stockholm	702000-1140	548	31,938	4/12/1973	Bandhagen	Farsta-Vantör
60	HSB Bostadsrättsförening Gasellen i Linköping	722000-1080	545	45,424	1/15/1965	Linköping	.
61	HSB Bostadsrättsförening Fosietorp i Malmö	746000-5353	543	47,196	10/15/1965	Malmö	Hyllie
63	HSB Bostadsrättsförening Smedby i Upplands Väsby	714800-2475	539	38,773	1/1/1980	Upplands Väsb	.
64	HSB BOSTADSRÄTTSFÖRENING ASPNÄS I JÄRFÄLLA	713200-0048	531	41,245	6/21/1966	Järfälla	.
67	BOSTADSRÄTTSFÖRENINGEN NÄCKROSEN I SOLNA	715200-1504	520	30,343	10/7/1944	Solna	.
68	HSB Bostadsrättsförening Marmorn i Stockholm	702001-4085	519	21,439	5/17/1930	Stockholm	Södermalm
70	HSB BOSTADSRÄTTSFÖRENING BJÖRKEKÄRR I GÖTEBORG	757200-9053	515	32,332	12/14/1954	Göteborg	Örgryte-Härlanda
71	HSB Bostadsrättsförening Viggbygärdet i Täby	716416-4373	511	42,511	3/21/1977	Täby	.
73	Bostadsrättsföreningen Solhöjden i Tyresö	769616-7878	507	38,076	6/8/2007	Tyresö	.
75	HSB Bostadsrättsförening Magelungen i Stockholm	702001-3798	502	31,433	11/20/1954	Bandhagen	Farsta-Vantör
79	HSB Bostadsrättsförening Lagmannen i Malmö	746000-5841	490	42,031	9/15/1962	Malmö	Hyllie
81	HSB Bostadsrättsförening Södertorp i Malmö	746001-0411	486	35,117	4/15/1969	Malmö	Hyllie
84	HSB:S BRF BACKA I GÖTEBORG	757200-9467	484	35,894	3/17/1965	Hisings Backa	Norra Hisingen
86	HSB Bostadsrättsförening Ljungelden i Lund	745000-1974	480	41,709	8/15/1963	Lund	.
88	HSB Bostadsrättsförening Kullen i Huddinge	716419-8769	474	30,782	3/30/1987	Huddinge	.
89	HSB:S BOSTADSRÄTTSFÖRENING VÄSTERBY I JÄRFÄLLA	713200-1046	467	27,304	4/23/1970	Järfälla	.
91	BOSTADSRÄTTSFÖRENINGEN LJUSKÄRRSBERGET 1	714000-2465	467	33,752	12/16/1971	Saltsjöbaden	.
93	HSB Bostadsrättsförening Domaren i Malmö	746000-5957	463	35,305	9/15/1962	Malmö	Hyllie
94	HSB BRF HISINGS KÄRRA I GÖTEBORG	757202-6248	460	31,321	2/22/2000	Hisings Kärra	Norra Hisingen
98	BOSTADSRÄTTSFÖRENINGEN NORRA GULDHEDEN NR 1	769604-7690	455	32,216	9/13/1999	Göteborg	Majorna-Linné
99	HSBS BOSTADSRÄTTSFÖRENING BRÅTENPARK I MARIESTAD	766000-0709	455	30,406	3/25/1982	Mariestad	.
102	HSB Bostadsrättsförening Timotejen i Norsborg	716416-4167	448	27,800	8/23/1976	Norsborg	.
103	HSB Bostadsrättsförening Klövern i Norsborg	716416-4183	447	27,254	8/23/1976	Norsborg	.
104	Bostadsrättsföreningen Hagalunden	769618-3339	446	32,236	2/14/2008	Solna	.
105	HSB BRF Slagtäppan i Eskilstuna	718000-2664	446	31,648	11/2/1965	Eskilstuna	.
107	HSB BRF Blåkulla nr 248 i Solna	716417-8068	440	32,767	7/12/1982	Solna	.

Rank	Name	Registration no.	Apts	Area (sqm)	Registration date	Postal City	City District
110	HSB Bostadsrättsförening Pålsundet i Stockholm	702001-7286	438	19,525	7/1/1942	Stockholm	Södermalm
111	HSB Bostadsrättsförening Berga i Helsingborg	743000-0922	436	36,380	11/15/1968	Helsingborg	.
112	HSB Bostadsrättsförening Granen i Järfälla	713200-1103	435	32,741	4/27/1967	Järfälla	.
114	HSB Bostadsrättsförening Kallkällan i Luleå	797000-1959	429	34,345	3/11/1965	Luleå	.
115	HSB Bostadsrättsförening Vårsådden i Stockholm	702002-5594	428	28,744	2/15/1958	Bandhagen	Farsta-Vantör
116	HSB Bostadsrättsförening Bofinken i Solna	715200-0175	426	34,813	7/24/1963	Solna	.
121	Bostadsrättsföreningen Årstaterrassen	702002-1775	423	20,065	8/26/1942	Årsta	Enskede-Skarpnäc
122	HSB Bostadsrättsförening Trädgårdsstaden i Stockholm	716416-6527	423	30,533	4/17/1979	Kista	Spånga-Kista
123	HSB Bostadsrättsförening Gäddan i Tyresö	769604-8383	419	32,545	9/24/1999	Tyresö	.
124	HSB Bostadsrättsförening Mälarblick i Huddinge	716417-9603	418	35,744	12/13/1982	Vårby	.
125	BOSTADSRÄTTSFÖRENINGEN JÄRNVÄGSMANNEN I STOCKHO	702001-0554	417	16,937	6/15/1929	Stockholm	Kungsholmen
127	HSB Bostadsrättsförening Heden i Skellefteå	794700-1132	416	28,254	9/19/1955	Skellefteå	.
128	Bostadsrättsföreningen Klosters Fälad i Lund	745000-2782	416	33,002	5/15/1962	Lund	.
130	HSB BOSTADSRÄTTSFÖRENING VÄSTERBY 2 I JÄRFÄLLA	713200-1038	414	26,300	1/25/1960	Järfälla	.
131	HSB Bostadsrättsförening Tingvallen i Lund	745000-2014	414	39,561	1/30/1965	Lund	.
132	BOSTADSRÄTTSFÖRENINGEN VÄNDKRETSEN	716400-1203	413	26,825	6/1/1956	Danderyd	.
136	HSB Bostadsrättsförening Stenbocken i Malmö	746000-6229	410	27,768	10/15/1960	Malmö	Södra Innerstaden
138	HSB BRF VILUNDA I UPPLANDS VÄSBY	714800-2087	406	23,854	9/25/2002	Upplands Väsb	.
140	HSB Bostadsrättsförening Ellstorp i Malmö	746000-4943	404	20,581	10/30/1937	Malmö	Centrum
142	HSB Bostadsrättsförening Gävlehus 11 i Gävle	785000-2127	401	28,979	9/19/1966	Gävle	.
144	HSB Bostadsrättsförening Stureby i Stockholm	702002-2179	399	21,674	4/7/1951	Enskede	Farsta-Vantör
145	HSB Bostadsrättsförening Trumman i Malmö	746000-5643	397	26,537	12/15/1949	Malmö	Västra Innerstaden
146	HSB Bostadsrättsförening Almedal i Malmö	746000-5395	397	24,376	9/30/1958	Malmö	Kirseberg
149	HSB:s Bostadsrättsförening Bergshamra i Solna	715200-0126	395	25,784	6/10/1952	Solna	.
150	HSB Bostadsrättsförening Pukan i Malmö	746000-5908	395	26,757	9/15/1951	Malmö	Västra Innerstaden
153	HSB Bostadsrättsförening Ättekulla i Helsingborg	743000-3405	391	27,787	9/30/1971	Helsingborg	.
154	HSB Bostadsrättsförening Elisetorp i Arlöv	746000-4638	390	28,637	6/7/1974	Arlöv	.
156	HSB Bostadsrättsförening Östergård i Halmstad	749200-3723	390	29,130	11/23/1963	Halmstad	.
157	HSB Bostadsrättsförening Sagoängen i Järfälla	713200-0717	389	28,612	10/25/1963	Järfälla	.
160	HSB Bostadsrättsförening Lillsjön i Östersund	793200-2186	387	26,532	12/30/1971	Östersund	.
161	HSB Bostadsrättsförening Hamnvakten i Stockholm	716416-6089	386	35,927	11/13/1978	Stockholm	Södermalm
162	HSB Bostadsrättsförening Albatrossen i Haninge	712400-0014	385	29,950	8/14/1964	Vendelsö	.
165	HSB Bostadsrättsförening Smaragden i Nacka	714000-1848	384	29,262	1/17/1967	Saltsjö-Boo	.
166	HSB Bostadsrättsförening Hallunda i Norsborg	716416-4027	384	28,320	5/24/1976	Norsborg	.
167	HSB Bostadsrättsförening Trädet i Norsborg	716416-4134	384	28,320	8/23/1976	Norsborg	.
169	HSB Bostadsrättsförening Kornet i Norsborg	716416-4142	384	28,320	8/23/1976	Norsborg	.

Appendix E – Definitions of variables used in the study

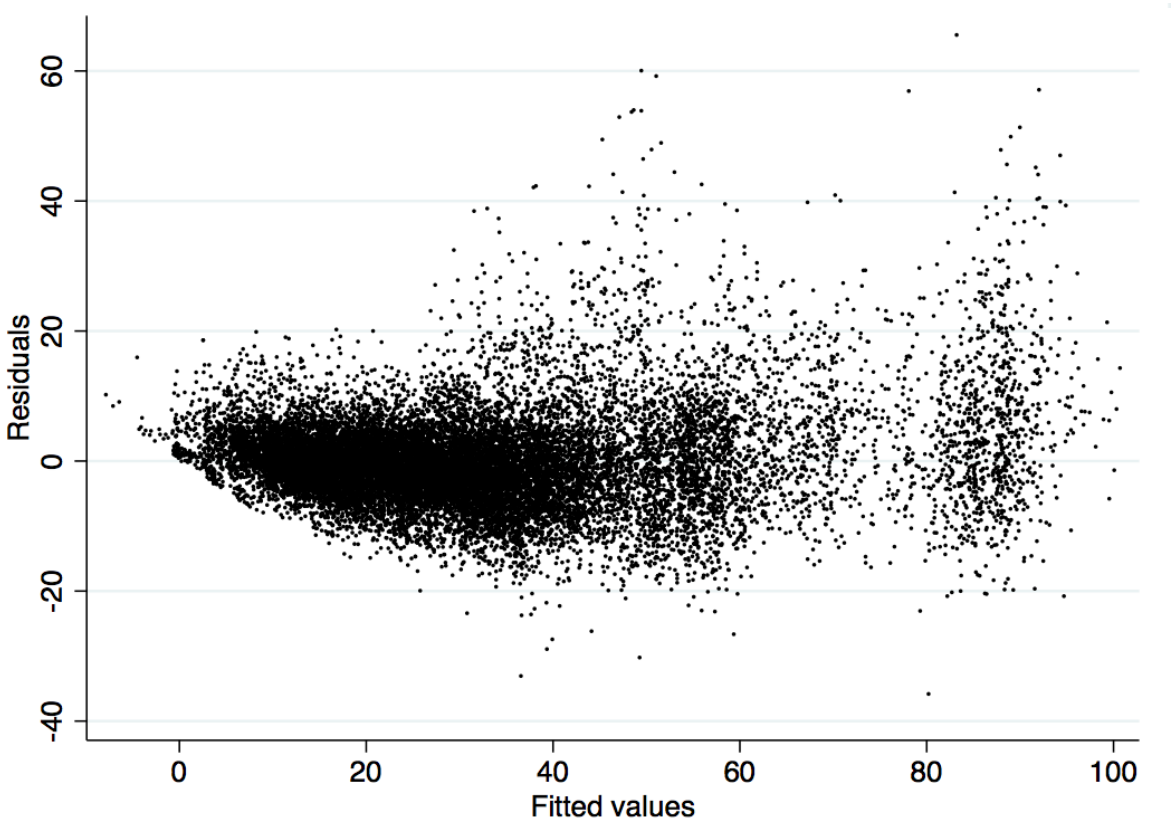
Variables used in the study and their respective descriptions (all monetary values are in thousand SEK)	
Variables related to TOAs and their financial performance and position	
Variable name	**Description**
Apts	The number of apartments within the TOA
Revenue	Total reported revenue
Assfee_sqm	Annual association fees divided by the TOA's total area in square meters
Assfee_LessIntExp_sqm	Association fees less interest expenses divided by the TOA's total area in square meters
Dep_sqm	Depreciation expenses divided by the TOA's total area in square meters
Capex_sqm	Capital expenditures divided by the TOA's total area in square meters
Net_inc_sqm	Net income divided by the TOA's total area in square meters
PPE	Total property, plant and equipment
Assets	Total assets
Cash	Total cash and cash equivalents
Equity	Total equity
Debt	Total interest-bearing debt
Netdebt_sqm	Total interest-bearing debt less cash and cash equivalents divided by the TOA's total area in square meters
Test variables related to financial reporting quality and financial reporting harmonization of TOAs	
Variable name	**Description**
Discl_index	An index taking a value between 0 and 1, intended to measure the general level of voluntary disclosure and is constructed using five variables: 'Review', 'Hist_overview', 'KPIs', 'CF_stmnt' and 'Dep_method_class'
Dep_method_class	A classification variable taking a value between 0 and 4, intended to measure the voluntary disclosure related to TOAs' depreciation of parts method. For more information, see Appendix C
Cap_rate	Measures the share of capitalized investments in relation to total expenditures for investments, maintenance and repairs
Binary variables used for calculating 'Discl_index'	
Variable name	**Description**
Review	Indicates whether the TOA has presented an annual review that fulfils certain criteria related to the detail in which TOAs disclose information related to their properties, apartments, living area, major investments and maintenance operations
Hist_overview	Indicates the presence of a multi-year historical overview
KPIs	Indicates the presence of key performance indicators containing condensed financial information, where at least three KPIs are required to fulfil the criterion. These KPIs should describe the TOAs' financial performance (e.g. association fee / sqm) and position (e.g. debt / sqm), whereof at least two KPIs should be related to the TOAs' income statement
CF_stmnt	Indicates whether the TOA has presented a cash flow statement
Variables related to apartment transactions	
Variable name	**Description**
apt_price	The price the apartment in question was sold for
price_sqm	The transaction price divided by the total area, in sqm, of the apartment
region_price_sqm	Control variable that measures the regional price level (per square meter) during the month the apartment was sold, where the region is based on the closest available price region to the apartment
apt_rooms	How many rooms the apartment constitutes
aptfloor	Which story the apartment is situated on
elevator	Indicates whether the building the apartment resides in has an elevator
balcony	Indicates whether the apartment has a balcony

Appendix F – Shapiro-Wilk test for non-normality of variables

Variable	Obs	W	V	z	Prob > z
Discl_index					
Pre (2011-2013)	100	0.965	2.854	2.327	0.010
Post (2014-2016)	100	0.985	1.211	0.425	**0.335**
2013	100	0.963	3.079	2.495	0.006
2014	100	0.976	2.000	1.537	0.062
Dep_method_class					
Pre (2011-2013)	100	0.980	1.675	1.144	**0.126**
Post (2014-2016)	100	0.938	5.156	3.638	0.000
2013	100	0.975	2.061	1.605	0.054
2014	100	0.951	4.006	3.079	0.001
Cap_rate					
Pre (2011-2013)	100	0.978	1.803	1.307	0.096
Post (2014-2016)	100	0.972	2.332	1.879	0.030
2013	100	0.945	4.551	3.361	0.000
2014	100	0.897	8.489	4.745	0.000

Notes: The table presents the results when testing our main variables for non-normality using the Shapiro-Wilk test. Using a significance level of 10%, numbers where we cannot reject that the variable exhibits non-normality are bolded. 'Discl_index' is a voluntary disclosure index based on five components that measures the general level of voluntary disclosure provided by the TOA. These include an annual review that fulfil certain criteria, a multi-year historical overview, key performance indicators containing condensed financial information, a cash flow statement and the level of disclosed information related to the TOA's depreciation of parts ('Dep_method_class'). All variables in 'Discl_index' are binary except for 'Dep_method_class' that takes a value between 0 and 4, based on a qualitative judgement of the level of useful information related to the TOA's depreciation of parts. 'Cap_rate' measures the level of capitalization of investments, by calculating capital expenditure as a share of the sum of capital expenditure and expensed maintenance.

Appendix G – Scatter plot chart illustrating heteroscedasticity of residuals in the final regression model



Notes: The scatter chart plots the residuals against the fitted values obtained from running our final regression model when testing non-financial and financial factors of TOAs on apartment prices. The scatter chart illustrates whether or not our assumption of using the 'robust' standard errors option was valid, given the presence of heteroscedasticity.

Appendix H – Hausman test of fixed effects regression model

	Coefficients			
	(b) fixed	(B) random	(b-B) difference	sqrt(diag(V_b-V_B)) S.E.
region_price_sqm	0.982	1.015	-0.034	0.009
apt_rooms	-3.527	-4.001	0.474	0.022
aptfloor	0.231	0.234	-0.003	0.014
Assfee_LessIntExp_sqm	-5.448	1.686	-7.133	1.759
Dep_sqm	3.249	7.761	-4.512	1.563
Capex_sqm	0.000	-0.457	0.457	0.036
Net_inc_sqm	-0.823	-4.541	3.717	0.561
Netdebt_sqm	-0.224	-0.116	-0.108	0.106

b = consistent under Ho and Ha; obtained from areg
B = inconsistent under Ha, efficient under Ho; obtained from regress
Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B) ' [(V_b) - (V_B) ^ (-1)] (b-B)
= **882.29**
Prob > chi2 = **0.0000**
(V_b - V_B is not positive definite)

Notes: The table presents the Durbin-Wu-Hausman (1978) test for fixed effects. The test evaluates whether the coefficients in our final regression model using fixed effects (b) is statistically significantly different from the coefficients in the same model without fixed effects (B). 'region_price_sqm' is a control variable that measures the regional price level (per square meter) during the month the apartment was sold, where the region is based on the closest available price region to the apartment. 'apt_rooms' indicates how many rooms the apartment constitutes. 'aptfloor' measures which storey the apartment is situated on. 'Assfee_LessIntExp_sqm' is a measure for a TOA's total operating expenses per square meter, since we argue that a TOA's association fee (less financial costs) should cover all the TOA's operating needs. 'Dep_sqm' is depreciation expenses per square meter while 'Capex_sqm' is capital expenditures per square meter. 'Net_inc_sqm' represents net income per square meter. 'Netdebt_sqm' is the TOA's total debt less cash and cash equivalents per square meter. A probability less than 5% supports our initial view that fixed effects have a significant impact on our regression model.

Appendix I – Robustness test of final regression model by testing across two different time periods

Variables (price_sqm dependent)	Pre-K3 (2010-2013)	Post-K3 (2014-2016)
Control variables		
region_price_sqm	1.034***	0.752***
apt_rooms	-2.758***	-4.461***
aptfloor	0.196***	0.265***
Explanatory variables		
Assfee_LessIntExp_sqm	1.312	4.717
Dep_sqm	-10.900***	0.909
Capex_sqm	-0.0573	0.227
Net_inc_sqm	-0.309	2.154
Netdebt_sqm	0.157	-0.176
Constant	2.587**	14.39***
Observations	10,948	9,237
R-squared	0.932	0.922
Standard errors, STATA assumption	Robust	Robust
Fixed effects	By TOA	By TOA

*Notes: The table presents the final OLS fixed effects regression model, using robust standard errors, used to examine the effect of TOAs' financial information on tenant-owned apartment prices. The table tests for the robustness of the model across two time periods, namely in the time period prior to K3 adoption, and the time period following K3 adoption. The dependent variable 'price_sqm' denotes the transaction value per square meter. 'region_price_sqm' is a control variable that measures the regional price level (per square meter) during the month the apartment was sold, where the region is based on the closest available price region to the apartment. 'apt_rooms' indicates how many rooms the apartment constitutes. 'aptfloor' measures which story the apartment is situated on. 'elevator' and 'balcony' are binary variables, indicating whether the sold apartment had a balcony and/or elevator. Financial variables with the denotation '_sqm' are values divided by the TOA's total area in square meters. 'Assfee_LessIntExp' is a measure for a TOA's total operating expenses, since we argue that a TOA's association fee (less financial costs) should cover all the TOA's operating needs. 'Dep', 'Capex' 'Net_inc' stand for depreciation expenses, capital expenditures and net income, respectively. 'Netdebt' is the TOA's total debt less cash and cash equivalents. All monetary values are in thousand SEK. Significance level: *** p<0.01, ** p<0.05, * p<0.1*