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A comparison across jurisdictions and standards**

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Co-ownership shares in condominiums – A comparison across jurisdictions and standards*

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Key words: Condominium, co-ownership share, ownership fraction, participation quota, share value, unit entitlement

SUMMARY

Condominium is one of the prevalent forms of three-dimensional (3D) property rights (Paulsson, 2007, p. 32). The condominium concept common to a number of jurisdictions consists of three elements: (a) individual ownership of an apartment, (b) co-ownership (joint ownership) of the land and the common parts of the building, and (c) membership of an incorporated or unincorporated owners' association (van der Merwe, 2015, p. 5). The ownership shares of condominium unit owners in the common property are here referred to as co-ownership shares; yet, alternative terms include ownership fraction, condominium share, participation quota, share value, and unit entitlement. The co-ownership share determines the proportional contribution to the common expenses and the share of common profits, as well as the voting power of each condominium unit owner in the administration of the condominium. The most common approaches to the determination of the co-ownership shares are based on equality, relative size or relative value of each condominium unit, or a combination of such (van der Merwe, 1994, p. 57-58). The literature presents detailed descriptions and comparative analysis related to condominium systems in different jurisdictions (e.g. van der Merwe, 2016; 2015; Paulsson, 2007; EUI, 2005; UNECE, 2005); however, the technical and procedural aspects related to the allotment of co-ownership shares still need to be further investigated. This paper aims to compare methods and procedures applied for the allotment of co-ownership shares of condominium systems in the following seven jurisdictions; Denmark, Germany, South Africa, Sweden, Switzerland, the Netherlands, and Turkey. Also, international geographic information standards (i.e. ISO LADM, OGC LandInfra/InfraGML) are analyzed to assess the extent to which they facilitate allocation of co-ownership shares. The main purpose is to clarify the legal provisions and methodologies related to the determination of co-ownership shares in national condominium systems and bring new insights to countries, which are trying to revise their national provisions for fairer implementations.

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1. INTRODUCTION

Condominium is one of the prevalent forms of three-dimensional (3D) property rights (Paulsson, 2007, p. 32). The condominium concept common to a number of jurisdictions consists of three elements: (a) individual ownership of an apartment, (b) co-ownership (joint ownership) of the land and the common parts of the building, and (c) membership of an incorporated or unincorporated owners' association (van der Merwe, 2015, p. 5). The ownership shares of condominium unit owners in the common property are here referred to as co-ownership shares; yet, alternative terms include ownership fraction, condominium share, participation quota, share value, and unit entitlement. The co-ownership share determines the proportional contribution to the common expenses and the share of common profits, as well as the voting power of each condominium unit owner in the administration of the condominium. The co-ownership share is also used in the distribution of compensation received in the event of the property being expropriated or in the division of insurance money if the building is destroyed (Chen, 2016, p. 8). Lastly, but more importantly, it will specify ownership shares in the parcel if the condominium scheme has been terminated, and thus will be the main determinant for further decisions, such as the construction of a new condominium building and sharing its units. This requires the development of clearly defined, societally accepted, and fairly applied methodologies for determining, modifying and altering co-ownership shares.

The most common approaches to the determination of the co-ownership shares are based on equality, relative size or relative value of each condominium unit, or a combination of such (van der Merwe, 1994, p. 57-58). In value- and floor area-based approaches, the co-ownership share is determined by dividing the unit's value or floor area to the aggregate value or the aggregate floor area of all condominium units, respectively. In some countries (e.g. Singapore) a number of factors showing usage level of joint facilities can also be taken into account (cf. Christudason, 2008). According to Ngo (1987), the value basis has the advantage that it represents the capital investment of the owner of the condominium unit, and therefore a more valuable condominium unit entitles the owner to a larger share in the parcel in the event of the termination of the condominium scheme (p. 313). However, the floor area basis may be more equitable in allocating shares for the common property since it provides certainty and clarity by being simple and easy to implement, also enabling the democratic management of common property and sharing common expenses (Chen, 2016, p. 10). The relative advantages of the value and floor area basis, and their practical implementations are open to discussion.

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The literature presents detailed descriptions and comparative analysis related to condominium systems in different jurisdictions (e.g. van der Merwe, 2016; 2015; Paulsson, 2007; EUI, 2005; UNECE, 2005). Also, a recent FIG publication stresses the importance of legal aspects of 3D cadastre, and calls for an interdisciplinary approach, including also legal expertise (van Oosterom, 2018). This paper responds by addressing the technical and procedural aspects related to the allotment of co-ownership shares, as this issue still needs to be further investigated. Thus, there should be a clear description and discussions concerning the types of area and value (e.g. total floor area, gross external area, market value, and cost value) used as the basis of co-ownership shares, criteria and methods for measuring and appraising area and value of different types of buildings (e.g. residential, commercial, and mixed use), the roles of stakeholders (e.g. owners, developers, valuation experts, and registrars), the relationship between co-ownership shares and management of the common property, and the necessary conditions for altering or modifying allocated co-ownership shares. The clarification of the legal provisions and methodologies related to the determination of co-ownership shares may provide a clearer understanding about national condominium systems and bring new insights to countries, which are trying to revise their national provisions for fairer implementations.

This paper aims to compare methods and procedures applied for the allotment of co-ownership shares of condominium systems in the following seven jurisdictions; Denmark, Germany, South Africa, Sweden, Switzerland, the Netherlands, and Turkey. The following section briefly describes the condominium regimes in the selected jurisdictions and jurisdiction-specific rules and procedures for the determination of co-ownership shares. Based on the information provided in this descriptive section, a comparison is undertaken in Section 3. International geographic information standards (i.e., ISO LADM, OGC LandInfra/InfraGML) are analyzed in Section 4 to assess the extent to which they facilitate allocation of co-ownership shares. Section 5 concludes the paper with discussions related to the methods for calculation of shares and analyzing how to include co-ownership shares as attributive information in LADM II, and further proposals, including pilot projects.

2. THE CONDOMINIUM SYSTEMS IN SELECTED JURISDICTIONS

This section provides a general overview of the condominium systems in Denmark, Germany, South Africa, Sweden, Switzerland, the Netherlands, and Turkey, and compares legal provisions and methods applied for the allotment of co-ownership shares. All jurisdictions selected belongs to the civil law legal system, except for South Africa, which applies a 'hybrid' legal system. This paper, therefore, mainly reflects on condominium concept in the civil law jurisdictions.

2.1 A general overview to the condominium system in Denmark

The condominium concept was introduced in Denmark by the Act on Owner Apartments (*Ejerlejlighedsloven*), which came into force 1. July 1966 (presently LBK nr 1713 16/12/2010). The act was motivated by similar development in other countries, supported by a concern to support the financing of multi-storage buildings (Bet. 395, p. 129ff; Blok, 1995, p. 7) by extending the customer base of mortgage institutions and allow condominium owners

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the same tax conditions as owners of detached houses. The act allowed for the establishment of condominiums in existing buildings as well as in new buildings. However, the former provision has been altered several times, with the consequence that subdivision of existing residential multi-storage buildings was possible only in two periods: 1966-1972 and 1976-1979 (Andreasen, 1997, p. 22). In 2016, a review of the act was commissioned. The committee in charge presented its report in 2018, among others suggesting stronger measures against condominium owners defaulting against the owner association, as well as suggesting wider application of the condominium concept.

Presently, it is possible to establish residential and non-residential condominiums in buildings built after the act came into force (1966) and in all buildings used for other than residential purposes. Of Denmark's 2 119 399 units of real property, 277 342 were condominium units, most of these, namely 237 126, residential condominiums (Skat, 2011).

The Kingdom of Denmark includes Denmark, Faroe Islands and Greenland. In 1970, the Parliament of Faroe Islands, Løgting, adopted the Danish Condominium Act with minor adjustments: Condominium units (*eigaraíbúðir*) could be established only in buildings constructed after the law came into force. Reference to licensed surveyors and corresponding documentation requests were omitted. However, the notion of co-ownership shares (*býtistali*) was instituted as in Denmark (Faroese Law-Site).

The Act on Owner Apartments applies the principles of a 'dualistic system' which integrates the individual ownership of an apartment and co-ownership of the common property into a composite ownership (van der Merwe, 2015, p. 6). A co-ownership share determines ownership of joint land, building and facilities, as well as rights and obligations relative to a mandatory owner association. If no ownership share is defined, condominiums are equal (sec. 2). The provisions of the act apply to residential apartments, as well as to shops, offices, stores and other delimited room space (sec 1). The property unit to be subdivided into condominiums has to be divided in its totality, and only when a licensed surveyor attests that [cadastral] subdivision is not feasible (sec 3). The condominium unit is considered real property, and recorded at the Land Registration Court (i.e. Land Registry) according to provisions by the Minister for Justice, to be detailed in next section (sec 4).

The management of the owner association, including accounting and auditing, shall proceed according to an order issued by the Minister for Industry, Business and Financial Affairs, unless a similar bylaw is established and recorded at the Land Registry. Shared costs, including costs concerning the land parcel, access road and sewers, insurances, maintenance of facilities, etc. are incurred by the individual owners according the co-ownership share. If changes of a condominium unit made by a condominium owner increase the amount of shared costs, the condominium owner is to pay the increase. The owner association may establish house rules (sec 5-7). The condominium owner has to provide access to the condominium for monitoring and repair. If an owner substantially defaults on obligations towards the owner association or a member of the association, the owner association may request the owner to vacate the condominium (sec 8).

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When conveying a condominium, the conveyor shall before the agreement is made inform the acquirer of the financing and maintenance costs of the condominium and the owner association (sec 9). Complex conditions for establishment (sec. 10) are not detailed here (cf. van der Merwe, 2015, p. 48).

The identification, location and extension of condominium units is detailed in the above-mentioned order by the Minister for Justice and by a government circular issued by the Minister for Industry, Business and Financial Affairs. The owner of the original real property (termed 'mother property', cf. BBR-instruks 2015, section 102) has to declare the establishment of condominiums in a statement to the Land Registration Court, before condominium deeds can be recorded in the Land Registry. The statement has to be accompanied by a condominium scheme and maps depicting every condominium. The condominium scheme and maps have to be attested (de facto prepared) by a licensed surveyor.

The scheme must list for each condominium:

- identifier,
- location described by cadastral identifier (of the mother property), street name, house number, floor, etc.,
- area in sq. meter, and
- co-ownership share.

The licensed surveyor is not requested to attest the co-ownership shares, the allocation of which rest with the owner, cf. next section. The surveyor also has to attest that condominium establishment cannot be achieved through cadastral subdivision (BEK nr 834 af 03/09/2009). The ministerial circular (CIR nr 177 af 25/08/1977) provides for an example of scheme and maps, which illustrate that a condominium may consist of more non-contiguous building parts. The building parts are detailed in the condominium scheme, and the use of these building parts, e.g. residential, shop, or store, is included in the example scheme. The areas have to be surveyed with an accuracy which grants a correct amount of rounded sq. meters.

The boundary of the condominium follows the outer side of the building. The boundary between neighboring condominiums is located in the middle of the wall, while the wall between condominium and joint areas is included in the condominium area. Similarly horizontally: Ceilings are divided between adjacent condominiums, while they are included into the condominium when bordering towards joint areas or underground. Special rules apply for sloping ceilings. The example maps show only legal boundaries, not walls and other construction details, except access facilities: staircases, corridors, etc., as well as balconies, etc., see Figure 2.1.1.

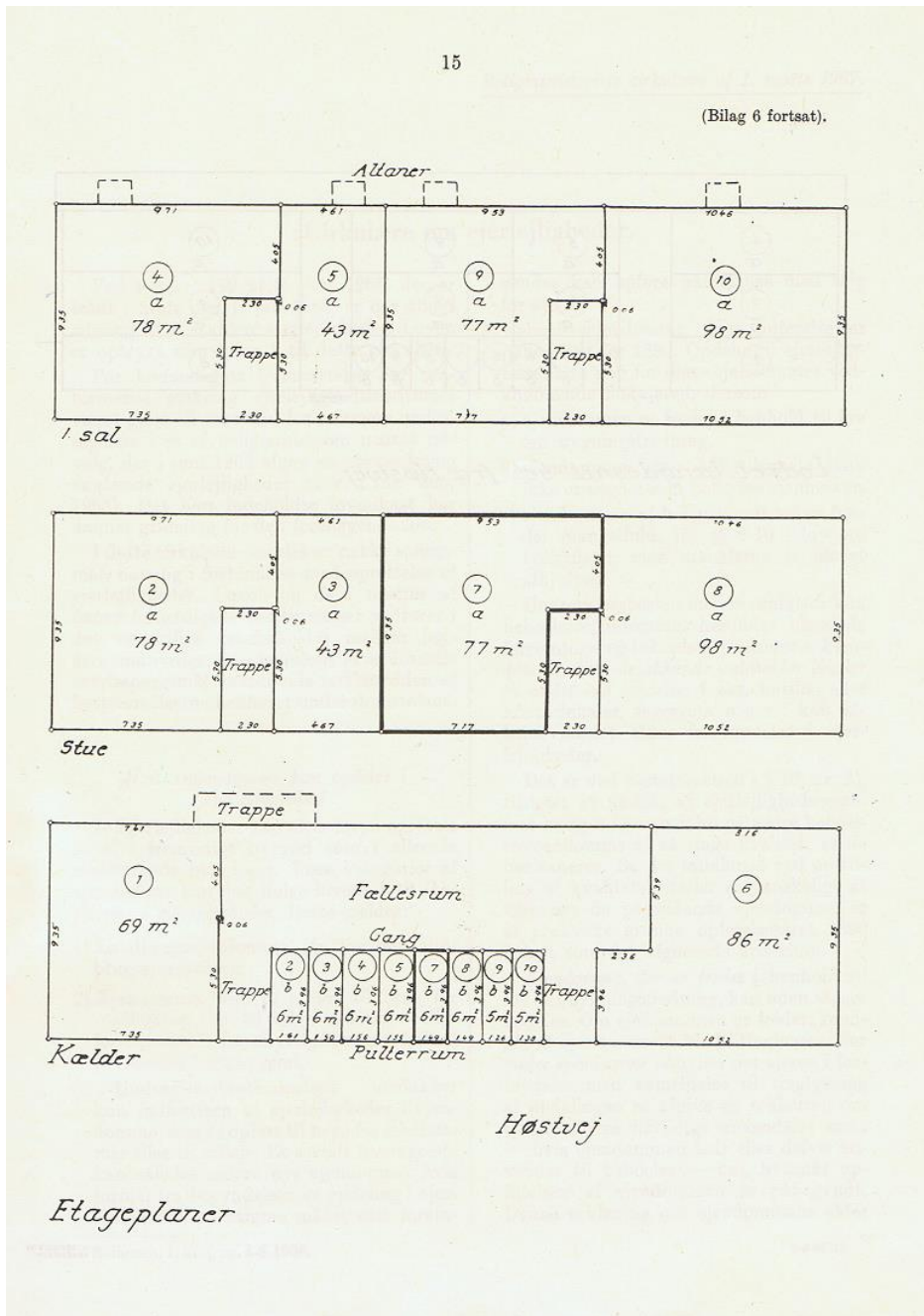


Figure 2.1.1. Example of condominium map according to Danish ministerial circular (part). Each floor is depicted (Kælder: Basement; Stue: Ground floor; 1.sal: First floor). Eight of the condominiums include a storage room (Da: Pulterrum). Balconies (Altaner), stairs (Trappe) and joint areas (Fællesrum, Gang) are depicted as well.

The layout of condominiums has to provide access to every condominium via joint areas, and each condominium must comprise the facilities needed for proper function within the

condominium or among joint facilities, but else the owner is granted substantial freedom in subdivision layout.

The Act on Owner Apartment regards 'delimited room space' (sec 1). This means that e.g. carports, parking lots and garden lots cannot be included into a condominium. Such areas may be assigned to specific condominiums through provisions in a section of the bylaws of the owner association, replacing the general ministerial order (cf. above sec 5-7), or through an easement, granted by the owner association to the condominium owner. Danish cadastral legislation allows only time limited (30 years) use rights to specific parts of a cadastral parcel. Such rights may be somehow protected through strict voting rules, e.g. special majorities, but bylaw rules requesting unanimous consent for changes is considered a violation of cadastral law, cf. Blok, 1995, pp 79 - 83. - Balconies, terraces, and similar facilities outside the building body may be indicated on condominium maps, even if they are not part of the individually owned property. The restricted access to the balcony, etc. excludes de facto other association members from using it, but basically, balconies, etc. are common property, cf. below on cost allocation.

The ministerial circular notes regarding the establishment of co-ownership shares that the act leaves this question open. The circular holds that a fair arrangement implies that the shares reflect the relative value of the condominiums. Condominium area is suggested as a point of departure, when condominiums are used for same purpose, e.g. residence, but relative market value should be used for relating e.g. residential and commercial condominiums.

2.1.1 The co-ownership shares in the Danish condominium system

As outlined above, co-ownership shares are in Denmark established by the owner of the 'mother property'. The fact that a licensed surveyor prepares the condominium scheme with the shares suggest a potential role. Bonnis (1968, p. 576) in addition to surveyors briefly mentions lawyers, but contributions by other professions seem likely. The documents have to be recorded at the Land Registry, before condominium buyers are entitled to discuss the shares. This is possible because of the interplay between commercial banks and mortgage credit banks. The former finance property development, but have their loans returned when condominium buyers finance their acquisition through mortgage banks (cf. Gjede, 1999, p. 8).

If the distribution of co-ownership shares is considered problematic, the owner association may change the distribution, but only through unanimous consent, as established through several court rulings (Blok, 1995, p. 393; Dreyer & Simiab, 2016, p. 91f, 178f). A prudent condominium buyer will seek compensation through the purchase price offered (cf. Blok, p. 225). Thus in Denmark we find discussions regarding the *use* and possible *change* of co-ownership shares, while discussion of *establishment* of co-ownership shares did not appear from the investigations made.

Co-ownership shares matters in the following contexts (Blok, 1995, p. 85):

- distribution of shared costs, cf. above description of sec. 5-7 of the act.

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- distribution of votes at the general assembly of the owner association, cf ministerial order on owner associations (BEK nr 1332 af 14/12/2004), and
- owner's share of the value of joint land, building and facilities, cf. sec 2 of the act. Tax authorities may use this for deriving taxable value.

Distribution of shared costs need not cover all housing costs. For example, bylaws may declare costs for consumption of heating, water, power, gas, etc., which can be individually and objectively measured, to be paid individually (Blok, 1995, p. 223). Similar individual payment may be installed for use of laundry, guest rooms, and parking lots (Blok, 1995, p. 226). Ordinarily, such arrangements are spelled out in the specific bylaw of the owner association, recorded at the Land Registry (Blok, 1995, 222ff). The maintenance of balconies has been an issue, since they are typically used exclusively. Court rulings have considered balconies being load-bearing parts of the building construction, and consequently allocated such maintenance to shared costs (Blok, 1985, p. 213-14). Maintenance of supply lines is a shared cost, but the consumer part is to be paid individually. The latter applies e.g. to radiators, water taps, wash basins, and toilet bowls (Dreyer & Simiab, 2016, p. 38)

Votes at the general assembly are counted according to co-ownership shares. The ministerial order requests 2/3 majority for 'decisions concerning substantial changes of shared facilities and accessories, or on sale of these, or on changes of the bylaw' (sec 2.4). As mentioned above, court ruling precludes general assembly decision to change co-ownership shares, unless all owners accede through unanimous consent (Blok, 1995, 392ff).

2.2 A general overview to the condominium system in Germany

The legal basis for a condominium right is dual. Besides the main German law dealing with how to own property, which is dealt with in third book of the German Civil Code (in German: Bürgerliches Gesetzbuch, abbreviated as BGB), the condominium ownership is captured by a separate law, the so-called Condominium Act (in German: *Wohnungseigentumsgesetz* – or short: WEG). It is a law which originated in 1951, but the current updates are from 2014.

The rights to a condominium can be obtained through property registration. Registration of the property is done through the ex officio creation of a separate Land Register folio (Register of Apartment Ownership (Wohnungsgrundbuch), Register of Unit Ownership (Teileigentumsgrundbuch) for each co-ownership share. The separately owned property corresponding to the co-ownership share shall be entered on this folio and the separate ownership rights (Sondereigentumsrechte) corresponding to the other co-ownership shares shall be entered as a restriction on the co-ownership share. The Land Register folio relating to the plot of land (prior to the condominium rights registration) shall be closed ex officio. (§ 7, (1) WEG). Attached to the registration are (§ 7, (4) WEG):

- an architectural drawing (“partition plan”) bearing the signature and seal or stamp of the building authority and showing the partition of the building as well as the location and size of the sections of the building constituting the separately owned property and the jointly owned property; all separate rooms which are part of the same apartment shall be given the same respective number.

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- a certificate issued by the building authority confirming that the requirements have been met.

The partition plan usually determines the general function of the apartment house which may be only a residence house or also serve as commercial building. It is thus for the co-owners to decide, if a certain unit may also be used as a restaurant. Parking spaces in a garage, for example, are considered to be self-contained areas where their surface area is identifiable through permanent markings, and can thus be granted separate ownership. (§ 3, (2) WEG). The apartment ownership is established by the so called partition plan (Teilungserklärung), which must be registered in the Land Register. The partition plan usually determines the general function of the apartment house which may be only a residence house or also serve as commercial building. It is thus for the co-owners to decide, if a certain unit may also be used as a restaurant. In case of destruction of the whole building, the condominium right and the associated interests on it continue to exist.

Mortgaging a condominium right is also possible. It does not require the consent of the other owners. The land may be subject to other restrictions, however, for example servitudes granting the right to use the land as a whole in certain respects (e. g., an easement of access), but also land charges and other interests in land may restrict the full ownership. The majority of the co-owners may resolve on the reconstruction of the building, unless more than half of it has been destroyed and the damage is not covered by insurance; in this exceptional situation a single apartment owner may even demand the dissolution of the community.

2.2.1 The co-ownership shares in the German condominium system

In general the German civil code (BGB) already recognizes multiple types of ownership, including the *co-ownership* (Miteigentum, §§1008-1011 BGB) and *joint ownership* (Gesamteigentum, §§718, 719, 1408, 1415, 2023 BGB). Co-ownership refers to two or more persons owning a portion of a single property together, whereas joint ownership refers to partners (e.g. spouses) who together own a single property. Under the Condominium Act an apartment ownership is possible which consists of a co-ownership of a portion of a property combined with an individual ownership of a flat. The Act provides the creation of a title to an apartment (Wohnungseigentum), and title to units (Teileigentum) in respect of non-residential areas of a building (§ 1(1) WEG).

The WEG makes a difference between a *Wohnung* (=apartment) and *Gebäude* (=building or flat). This difference is relevant for the kind of rights connected to it. Title to an apartment comprises the separate ownership (Sondereigentum) of an apartment together with a co-ownership share (Miteigentumsanteil) of the jointly owned property (gemeinschaftliches Eigentum) of which it is an integral part. (§1(2) WEG).

The “Community of Apartment Owners” (in German: Wohnungseigentümergeinschaft) exercises the collective rights of the apartment owners and fulfil the collective obligations of the apartment owners, as well as other rights and obligations of the apartment owners insofar as these can be asserted jointly or are to be fulfilled jointly (Ch. 2, section 10, (6) WEG). The

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plot of land as well as those parts, facilities and installations of the building are subject to jointly owned property. Co-ownership of the plot of land may be restricted by way of a contract between the co-owners such that, each co-owner is granted separate ownership of a specified apartment or of specified non-residential areas of a building constructed, or to be constructed, on the plot of land. The common ownership has however also a number of implications and limitations regarding the use of the property. The Condominium Act itself provides just a few mandatory rules regarding the rules between the co-owners. Instead, one of the implications is that co-owners are free to set up rules governing their relations. As a result, condominium by-laws are created by all apartment owners. Such by-laws become applicable to future owners under the condition that these are registered within the Land Register, such that these can be traced back for any future co-owner (§ 10 II WEG).

A “Community of Apartment Owners” has the capacity to sue and be sued before the courts. (§ 10, (6) WEG). In relation to all aspects of administration of the jointly owned property, the community of apartment owners itself can acquire rights and be subject to obligations against third parties and the apartment owners. (§ 10, (6) WEG). The administrative assets of the Community of Apartment Owners consist of the things and rights created by law and acquired in legal transactions in connection with all aspects of administration of the jointly owned property, as well as any obligations which have arisen. The administrative assets include in particular the claims and powers based on legal relations with third parties and with apartment owners, as well as moneys received. (§ 10, (7) WEG). The condominium by-laws may also provide a regulation as to the distribution of the shared costs as, e.g. a per capita distribution, a distribution per square meters, in deviation from the distribution according to the percentage of the co-ownership share (§ 16 (2) WEG).

2.3 A general overview to the condominium system in South Africa

Sectional ownership was introduced in South Africa by the Sectional Titles Act 66 of 1971 modelled on strata title legislation of New South Wales. Legislation was required to breach the maxim *superficies solo cedit* in terms of which the owner of the land is also owner of everything attached to the land and thus to allow ownership in unit in multi-unit buildings. The rudimentary Act of 1971 was modernised by the second generation Sectional Titles Act 95 of 1986 (which for example introduced provisions on phased development and the concept of exclusive use areas), and eventually by the third generation sectional title legislation of 2011. Modelled again on strata title legislation of New South Wales, the Sectional Titles Act was divided into the Sectional Titles Act which retained the registration and other technical provisions, while management and administration provisions were re-enacted in the Sectional Titles Schemes Management Act 8 of 2011. Simultaneously, the Community Schemes Ombud Service Act 9 of 2011 ushered in a new sectional titles dispute resolution mechanism.

On acquisition of ownership in a section, the owner enters into a threefold legal relationship. He becomes the owner of the section, the co-owner in undivided shares of the common property and a member of the body corporate (the management corporation, owners’ association) and should therefore play an active part of the management of the scheme.

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A sectional titles scheme is established by the developer requiring an architect and land-surveyor to prepare a draft sectional plan indicating how the land and the building are physically divided into sections, the common property and exclusive use areas. The sectional plan consists of at least 5 parts namely the title page contains the name of the scheme, a description of the land, and buildings included in the scheme; a block plan which indicates a description of the contiguous land, the location of external boundaries of the buildings in the scheme and encroachments and servitudes on the land; floor plans in respect of each storey in the buildings indicating the floor areas of all the sections in the scheme, a cross-section plan indicating the height of all sections in the schemes and a participation quota plan indicating the floor areas and participation quota of all the sections in the scheme. This draft sectional plan must be approved by the Surveyor-General and then submitted to the land registry for registration and the opening of a sectional title register. On acquisition of a sectional title unit, the purchaser is furnished with a sectional title deed.

The main component of a sectional title scheme is a 'unit' consisting of a section and an undivided share in the common property apportioned to that section in accordance with the participation quota of the section. A 'section' is defined as a section as shown on the sectional plan. The boundaries of a section are the median lines of the walls, floor and ceiling of the section. This causes practical problems: the duty to repair a burst pipe in the wall of a section will depend on whether the pipe is located inside or outside the boundary wall of the section. A section may include adjoining parts of the building such a balconies, atriums or projections and also non-adjoining parts for example in the basement of the building such a parking spaces and storage areas. The Sectional Titles Schemes Management Regulations introduced a distinction between primary sections and utility sections accessory to a primary section such as a bathroom, toilet, storeroom, workshop, shed, servant's quarters and parking bays. This distinction is mainly applicable to management matters. 'Common property' is defined exclusively as the land and parts of the building not included in a section. Examples are the external crust of the building beyond the median lines of the walls, the foundations and roof of the building, corridors, staircases, lifts and communal facilities inside the building and the swimming pool, gardens and communal buildings such as a squash court or club house outside the sectional title building. An 'exclusive use area' is defined as a part or parts of the common property for the exclusive use by the owner or owners of one or more sections. Examples of such exclusive use areas are storage rooms, balconies, parking bays in the basement of the building and the demarcation of part of the outside walls for installing a billboard or signage. Parking bays or garden areas may also be established as exclusive use areas on the land surrounding the building. These exclusive use areas may either be established as registered exclusive use areas on the sectional plan or as rule-based areas in the rules of the scheme. If established as registered exclusive use areas, the holder is issued with a certificate of registered real right to the area in question which may be mortgaged, leased or charged with a personal servitude of usufruct (life-rent) use or habitation.

From the date on which any person other than the developer becomes an owner of a unit a body corporate (management corporation, owners' association) is deemed to be established consisting of all the existing and future owners in the scheme. The body corporate is

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responsible for the enforcement of the rules of the scheme and for the control, management of the common property for the benefit of all its members. The body corporate is not subject to the Companies Act of 2008, but is a special kind of juristic person endowed with legal capacity. It has its own name and may own property independent from its members; it has perpetual succession and capable of suing and being sued in its corporate name in respect of amongst others on contracts entered into by the body corporate and damage to the common property. The main functions of the body corporate are to establish a administrative and a reserve fund and to collect contributions from the owners to stock the funds; to insure the building to its replacement value against fire and other risks; to maintain the common property, plants cables and ducts in accordance with the 10 year maintenance, repair and replacement plan that must be prepared for every sectional titles scheme. The main functions of the body corporate are to appoint agents and employees; on special resolution, to acquire, mortgage or lease units; on special resolution to borrow moneys and to secure such loans; and to invest moneys in the administrative and reserve fund.

The main organs of the management body are the general meeting and the trustees (executive committee). The general meeting is the 'legislative' arm of the body corporate who governs the scheme by the adoption of ordinary resolution except in matters where the Sectional Titles Schemes Management Act or Regulations require a special or unanimous resolution. The first general meeting must be held within 60 days after the establishment of the body corporate and thereafter annual general meetings must be held yearly. Special general meetings are held on the authority of a trustee resolution and must be held at the written request of 25% in value of the total quotas of all the members or 25% in number of the bondholders.

The trustees (executive committee) are the executive arm of the body corporate that conducts the daily management of the scheme. They are elected annually and exercise all the functions and powers of the body corporate subject to the provisions of the Act, the management and conduct rules and directives of the general meeting. They are assisted by managing agents who act on their behalf. It was found that most trustees are ill-equipped on account of lack of knowledge, skill and experience; limited time; and no remuneration for their services. Furthermore they are not indemnified against liability for all losses except for breach of their fiduciary obligation and not for negligence and their decisions are not sufficiently business-like. Although their personal involvement for love and charity are valued and they are cheaper than professional managers, the Sectional Titles Schemes Management Regulations have given especially larger sectional title schemes the choice of appointing an executive managing agent to replace the trustees as the executive arm of the body corporate. Such managing agent would have the necessary skill, knowledge and experience, have more facilities at his disposal and as the official organ of the body corporate would be liable for negligent administration.

A sectional titles scheme is from the establishment of the body corporate regulated and managed by means of rules (by-laws) subject to the provisions of the Act. These rules comprise the management and conduct rules prescribed in Annexure 1 and 2 of the Sectional Titles Schemes Management Regulations. The prescribed management rules deal with governance matters concerning the election, powers and meetings and decisions of trustees;

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general meetings; financial management; administrative management (governance documentation and managing agents); and physical management (improvements to the common property, the use of sections and the common property and the obligation to maintain). The prescribed conduct rules deal amongst others with the keeping of pets; refuse and waste disposal; vehicles on and damage to the common property; appearance of sections and exclusive use areas; storage of flammable materials; behaviour of occupiers and visitors in sections and on common property and eradication of pests. In order to maintain a sound management structure, only a few management rules may be altered by the developer when submitting and application for the opening of a sectional title register. An alteration of the prescribed management rules may be made by a unanimous resolution of the members and only after at least 30% of the units have been transferred by the developer. The conduct rules may be altered by the developer on submission of his application or later by the members of the body corporate on special resolution. Any alteration of the management or conduct rules must be approved by the chief ombud who will only do so if the altered rule is reasonable and appropriate to the particular scheme.

The non-payment of contributions may be enforced by an application for the payment of arrear to the regional ombud service where the scheme is located; by a claim for collection costs, attorney's fees and interests on arrear by suspension of the vote of the defaulter. However, the most efficient mechanism is an embargo on the transfer of a unit unless a conveyancer certificate stipulated that all amounts due by the transferor has been paid. The difficulty is the claim of the body corporate is trumped by the secured claim of a bondholder of the unit. In the case of non-compliance with social obligations, for example causing a nuisance, the complainant may approach the regional ombud for an order that the nuisance must be stopped.

2.3.1 The co-ownership shares in the South African condominium system

The South African Sectional Title Act has adopted a unique twofold basis for calculation of the co-ownership share of a unit. For residential units the formula is area-based on the size of the unit, whereas the calculation of co-ownership shares for non-residential units is based on the value of the unit. In the case of residential sections, the share is objectively determined by dividing the floor area of a particular section in square meters by the aggregate floor areas of all the sections in the development, without any stakeholders or actors playing a part (s 32(1)). The result of this calculation will be indicated on the last sheet of the sectional plan as a percentage expressed to four decimal places (s 5(3)(g)).

In the case of non-residential sections, the developer is solely responsible for the determination of the co-ownership share of a particular section, correct to four decimal places (s 32(2)(a)). He or she allocates, presumably with the help of a conveyancer, the co-ownership share of every non-residential section in the scheme. In practice it often happens that the developer determine the co-ownership shares in non-residential sections on the basis of their relative floor area.

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In the case of a mixed-use scheme, consisting of residential as well as non-residential sections, the STA provides that the developer must allocate a percentage, say 60% of the total quotas (share values), to the residential sections and then divide the total of the quotas (share values) allocated by the developer to the residential sections among them in proportion to their relative floor areas (s 32(2)(a)). Although it is not expressly stated, the implication is that the remaining 40% of the quotas (share values) allocated to non-residential sections must be divided amongst the non-residential sections as determined by the developer for each non-residential section.

The share value allocated to a particular section, determines the value of the vote of the owner of each section for the adoption of ordinary resolutions at a general meeting. The fact that a vote by a show of hands is no longer recognised and that a majority resolution requires a majority in value, indicates that the value of the vote of a particular owner has become more significant. Furthermore, the quorum for a general meeting of a scheme consisting of four or more primary sections requires the presence in person or be proxy of members entitled to vote and holding one third of the total votes of members in value (co-ownership shares) (STSM Regulations Annexure 1 rule 19(2)(b)). A sectional owner's quota is also relevant in determining the percentage (25 percent) of owners who may require that a special general meeting be convened (STSM Regulations Annexure 1 rule 17(4)(a)). Note for a special resolution to be adopted a 75% majority in number and value (STSM s 1(1) "special resolution" and Sectional Titles Schemes Management Regulations Annexure 1 rule 20(1)(b)) is required for instance for carrying out improvements or alterations reasonably necessary to the common property of the scheme (STSM Regulations Annexure 1 rule 29(2)).

Area-based in case of residential sections

Co-ownership shares in case of residential sections are based on the floor area of each section measured by an architect on actual measurements at time when all sections in the scheme is completed. These measurements are indicated on the floors plans of each storey (floor) in the scheme. The architect must write an examination on the preparation of sectional plans (STA s 6(1), for more details, see Sectional Titles Regulations reg 5 on 'draft sectional plans').

The following minor points of criticism can be levelled against the manner in which floor area is calculated for the purpose of determining the participation quota.

First, in order to obtain more precise results, it has been suggested that the floor area of each section should not merely be measured correct to the nearest square metre (STA s 5(3)(e)) but correct to four or five decimal places. Although the Sectional Titles Act provides that the final participation quota should be rounded off to four instead of three decimal places, one of the components for arriving at the final figure, namely the floor area of each section, is still only rounded off to the nearest square metre (STA s 32(1)).

Secondly, not only the floor area of the main portion of a section but also the floor area of a the other parts of a section such as a contiguous balcony or similar projection, and non-contiguous parts like a garage or storeroom, are taken into account in determining the

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participation quota.¹ If only some sections have such additions, their owners will have an unfairly large participation quota because the value of a section does not necessarily increase proportionately to the size of the floor area of such additional amenities. In short, an additional room in the main part of the section may be much more valuable than a balcony of similar size.² On this assumption the Israeli statute on condominium in principle takes no account of the floor area of balconies in calculating the participation quota.³ A more equitable solution would perhaps be to take only a percentage, say 50 percent of the floor areas of balconies and garages, into account in calculating the participation quota.

Thirdly, only the floor area of a section is taken into account without any reference to the volume of air space enclosed by the boundaries of the section. The cubic area of a penthouse with an elevated roof on the top storey of a sectional title building might be considerably more than the cubic area of a unit with a low ceiling of similar floor area on the ground floor. The underlying rationale for this criticism seems to be that the participation quota of a section should correspond as closely as possible to the relative value of a section. Therefore, if size is taken as the basis for calculation, then, depending on the physical structure of the building, not only floor area, but also volume should be taken into account (see van der Merwe, 1987).

Value-based in case of non-residential sections

Co-ownership shares are not based on selling price but on par value or objective market value at the time the shares are determined by the developer in his application for the registration for the registration of the draft sectional plan.

In view of the Memorandum to the 1986 Sectional Titles Act, it is generally accepted that it was envisaged that the developer should employ a par value or similar criterion to allocate the participation quotas of non-residential sections in a non-residential scheme or in a mixed-use scheme or to issue special rules to amend the voting rights of sectional owners and their proportional contributions to common expenses. There is, however, no provision in the Sectional Titles Act which requires the developer to use objective criteria when allotting quotas or indeed to disclose the formula he employed to arrive at his or her allocations. A developer may thus take into account whatever variables he likes and no-one could blame him if his calculations were inaccurate. This problem can be overcome by an amendment of the Sectional Titles Act to incorporate the provisions of the Uniform Common Interest Ownership Act of the United States (2014 version) which requires that the developer must state the formulas used to establish the allocation of the co-ownership shares of the non-residential units in the scheme (S 2-107(b)). This provision does not require that the formulas used by the declarant be justified, but it does require that the formulas be explained. The sole restriction on the formulas to be used in these allocations is that they must not discriminate in favour of the units owned by the developer (declarant). Otherwise, each of the separate allocations may

¹ These rooms form part of a section if they are numbered the same as the section on the sectional plan of subdivision.

² This might not be true in the case of certain resort schemes where an extra balcony with a view on the sea might greatly enhance the value of the section.

³ In terms of s 57(b) of the Land Law, the floor areas of balconies are taken into account only if the rules so provide. See Weisman 1970 *Israel LR446*, 1970.

be on any basis which the developer (declarant) chooses, and none of the allocations need be tied to any other allocation. This discourages misuse of any basis (par value or otherwise) and minimises the possibility of miscalculations.

The STA does not provide for the alteration of ownership shares but for the two other aspects determined by the ownership share, namely the weight of the vote of a sectional owner, and an owner's proportionate contributions (levies) to the administrative and reserve fund and the proportionate liability of the sectional owner for the debts of the body corporate, may be modified. Such modification may take place by the developer adding a rule to this effect when submitting an application for the opening of a sectional title register or by the members of the body corporate making such a rule by special resolution (STSMA s 11(2)(a)). Modification of the participation quota by the body corporate is subject to two provisos: firstly, that such modification may not take place before at least 30% of the units in the schemes have been transferred to outsiders and, secondly, that where a sectional owner is adversely affected by such resolution of the body corporate, his written consent must be obtained (STSMA s 11(2)(b) and (c)). The requirement of written consent is too rigid. On the one hand it might be very difficult to determine whether a particular owner has, seen objectively, been prejudiced by a particular amendment and on the other hand, it is unlikely that any owner would give his written consent (without a *quid pro quo*) for a measure which would prejudice him.

The subdivision and amalgamation (consolidation) of residential sections, the extension of a section into the common property, the demolition of one or more residential sections and the addition of new residential sections, do not cause any problems in practice. In the case of subdivisions and amalgamation (STA s 22(1)(f) and 23(1)(e)) and the extension of residential sections (STA s 24(7)), the new sections are re-measured and the original sectional plan readjusted to indicate the altered co-ownership shares. In the case of the demolition of a residential section or sections, the co-ownership shares of the remaining sections must be readjusted to reflect the present position. In the case of the creation of a new section as part of an addition of new sections to the scheme in terms of STA section 25, the participation quotas of the existing sections must re-adjusted to reflect the present position.

This is very problematic in the case where the ownership shares of non-residential sections need to be adjusted in the situations discussed above. As the developer is not compelled to disclose the formula he or she used to allocate quotas to non-residential sections in non-residential or in mixed-use schemes, there are no criteria to guide the readjustment of co-ownership shares in the situations discussed above.

A major objection to the provisions on co-ownership shares of the Sectional Titles Act and the Sectional Titles Schemes Management Act is that it is too inflexible because it endeavours to regulate three utterly divergent matters by one and the same formula, namely relative floor area or relative value (see Risk, 1968). The three matters regulated, do not necessarily operate in the same direction: a relatively high co-ownership share is an advantage as far as voting at general meetings is concerned and for participation in a distribution of assets on dissolution of

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the scheme, but it is a marked disadvantage during the life of the scheme because of increased contributions to common expenses.

In this regard, relative floor area or for that matter the relative value as the basis for determining contributions to the maintenance, repair and administration of the common property and amenities, is open to serious criticism. Such contributions should rather be calculated in the light of the benefit derived from each amenity by a particular sectional owner as well as the use he makes of such amenities (see Vallée-Ouellet, 1978). This is especially true where special amenities such as a swimming pool, a children's crèche or a tennis court form part of a development. If the floor area or relative value ratio is adopted in preference to a formula based on the benefit derived from or use of these special amenities, certain owners are prejudiced by the fact that they have to contribute to common expenses incurred for common amenities from which they derive no benefit. An owner without a motor car might for example have to contribute to the salary of a security guard for garages, a childless couple might be forced to contribute to the maintenance of a crèche and an invalid might have to contribute to the running costs of a tennis court. If the building has a lift, the question can rightly be asked whether it is equitable that the owner of an apartment on the ground floor should be compelled to contribute in proportion to his apartment's floor area to the maintenance of the lift.⁴ Again, if three lifts in a mixed-use scheme serve only the residential units on the higher floors and not the commercial units on the bottom floor, it is unfair that the owners of the units on the bottom floor should contribute in terms of a special levy for the refurbishment of the lift.⁵ In a residential scheme with a common dining-room providing main meals, the question arises whether the cost of meals should be borne solely by the owners who patronise the dining room or be subsidised from general contributions.⁶ It is questionable whether the allocation of shares in the common property in terms of the Sectional Titles Act is in accordance with the conflicting goals envisaged by such an allocation, namely first, to provide a simple criterion, which will remain constant over time, by which an owner can easily determine his share in the common property at any given moment, and, secondly, to guarantee that a sectional owner will receive a fair return on his investment upon the sale or termination of the project (see Judy & Wittie, 1978). These goals also serve the mortgagee's interest in a particular unit or units. If the share in the common property allocated to a particular unit is easily determinable, valuation of the unit is facilitated and if the sectional

⁴ In *Julian-Armitage v The Proprietors Astor Centre* [1988] QCA 111 the issue put before the Queensland Supreme Court was whether the owner of the lower ground unit (the appellant) had to share the maintenance costs in relation to the operation of the lifts servicing the other units in the scheme – despite the appellant having no use for the lift. The court held that the appellant did have to make a contribution to the body corporate for the upkeep and maintenance of the common property – which included the sharing of the costs of the electricity used to operate the lifts, despite *not* having any use for the lifts, personally.

⁵ *Herald Investments Share Block (Pty) Ltd and Others v Meer and Others; Meer v Body Corporate of Belmont Arcade and Another* 2010 (6) SA 599 (KZD).

⁶ *Gladwin and Da Motta June 2014 Without Prejudice* 62 suggest that the following costs should be divided in accordance with the participation quota: maintenance of common areas, insurance premiums and municipal charges. According to them it might be equitable to charge owners equally for the following expenses: annual general meeting costs, audit fees, bank charges, legal fees for work that benefits all owners equally, management fees, meter reader's fees, stationary, postage and petty charges and arguably security guard and associated costs.

owner is guaranteed a fair return on his investment on termination of the project, the mortgagee is also assured of the soundness of his security.

A valid criticism against an allocation based on floor area and par value is that a disproportionate rise in the market value of a particular residential section on account of interior decorations or other factors would not be reflected in the participation quota of that section. This problem can only be solved by legislation providing for periodic reappraisals and recalculation of the relative par values of sections. The cost of periodic reappraisal would have to be weighed against any resultant advantages.

2.4 A general overview to the condominium system in Sweden

The concept of 3D property was introduced in the Swedish Land Code (SFS (1970:944) in 2004 and the legislative basis for forming condominium units (apartments, in Swedish: ägarlägenhetsfastighet) was added to the Land Code and other related Acts in 2009. The demand for condominium has been rather limited so far, which is in contrast to initial expectations. After a slow start, there seems in recent years to be an increased interest today in larger urban areas, based on statistics from Lantmäteriet, the Swedish mapping, cadastral and land registration authority, see e.g. Lantmäteriet (2012; 2018a).

The Swedish condominium belongs to the dualistic condominium ownership type, meaning that each resident owns the physical part of the building where the apartment is located and in addition has a share in the common property of the building and land. A condominium unit is in the Swedish Land Code (and Real Property Formation Act (SFS, 1970:988)) defined as a three-dimensional real property not intended to contain more than one single apartment for housing purposes (SFS 1970:944, chapter 1, section 1a). Statutes regulating the formation and management of condominiums are mainly found in the traditional body of legislation regulating ownership, use and management of land. The reason is that statutes for 3D real property and condominium have not been regarded as different from other traditional real property and thus not been demanding any separate legislation. Instead, these forms and connecting regulations were included in existing legislation, e.g. the Land Code (SFS 1970:994), the Real Property Formation Act (SFS 1970:988), the Joint Facilities Act (SFS 1973:1149) and the Joint Property Unit Management Act (SFS 1973:1150).

A condominium unit is regarded as real property in the same way as traditional 2D property exempt that its spatial extension even is regulated in the third (Z) dimension and with the addition of some other specific regulations (Lantmäteriet, 2018b). There are, however, a number of specific regulations concerning the creation of 3D property and condominium. Special statutes forming or re-forming 3D properties, including condominium units, exist. General statutes are provided in the Real Property Formation Act (SFS, 1970:988, chapter 3, section 1 and 1a) and state that the result of the 3D property formation or re-formation should be more appropriate than other measures for achieving the intended purpose. The 3D property unit is intended to contain a building or other facility (e.g. an underground tunnel) or part of a building or other facility. The 3D property unit may be formed only if the facility containing it already has been constructed and that it has to be provided with the additional rights that it will need in order to be used for its purpose. If the 3D property is intended for housing

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purposes it has to contain at least three dwelling units. Furthermore, the financing shall be secured and the 3D property should be expected to be used for its purpose within the near future.

In addition to the statutes for forming 3D property mentioned above, specific statutes for condominium exist (SFS 1970:988, chapter 3, section 1b). First, condominium can only be created in new buildings, or buildings not having been used for (private) housing during the last eight years, calculated from the date of the real property formation decision by the cadastral authority. It is, in other words, possible to create condominium units in older buildings being converted into housing purposes, such as former office buildings and loft conversions. Second, a minimum of three condominium units have to be created together within the same building. The reason for this is to avoid that the property division becomes too complex, as well as to enhance the opportunities for a good living environment and promote the cooperation between adjoining apartments. A third condition for creating a condominium is that the access to stairs and other common facilities has to be secured.

The Swedish legislation does not contain any regulation on where the boundaries between 3D property units are to be located. According to recommendations (Lantmäteriet, 2009), the apartment unit within the condominium building should consist of the actual space of the condominium and the surface of the structures that are separating the apartments. The condominium apartment should not consist of more than one area/space. It is not specified in the legislation exactly what parts of the building that should be in private or common ownership, but there are recommendations for this as well.

Although there is no compulsory form of cooperation between the condominium units provided in the legislation, normally a joint facility and/or a joint property unit is formed and is in fact required if joint facilities or joint property units are formed, which is nearly always the case and means that in most cases this will be the standard solution.

The condominium owners have shares in a joint property unit (in Swedish: *samfällighet*) and joint facility (in Swedish: *gemensamhetsanläggning*). In order to secure co-ownership of the land the condominium is located upon and of common facilities, such as the above mentioned stairs, and other installations intended for common use. The condominium unit can also be granted the right to use individual parts of the joint property through easements, where the condominium owners have the right to use parts of another property unit containing the necessary facilities.

A joint property unit is land legally attached to two or more real property units. A joint property unit has traditionally been used for extracting natural resources, like timber or fish, but can now be used for many other purposes. The shares are not attached to the actual owners, but to the involved real properties. In other words, the share in the joint property unit follows with the sale of the condominium, which is the legal shareholder, when sold (SFS 1970:988, chapter 1, section 3; SFS 1973:1150). The condominium units are individually owned by the shareholder(s).

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The plot of land on which the condominiums are located is normally converted into a joint property unit by the cadastral authority when they are created. Each condominium unit has a share in this joint property. A joint property unit may also include features of common interest, such as construction details like load-bearing beams, within the building. The co-ownership of the land the building is erected upon and areas of common interest are thereby secured for the (owners of the) condominium units by being part of a joint property unit.

The management of physical installations of common interest for the condominium (such as an elevator or heating central) are being secured by creating joint facilities. A joint facility is a right to own and maintain one or more constructions (facilities) beneficial for two or more real property units (SFS 1973:1144) on another real property. A joint facility can, for example, be a private road or a parking area, or other facilities where there is a mutual interest from owners of several properties in using or maintaining the facility, such as staircases and other installations beneficial for the condominium. Even roofs and facades may need maintenance and should be included in a joint facility for condominium (Lantmäteriet, 2018b). The share in the joint facility follows the condominium unit, i.e. the stakeholder property, when sold.

A joint facility can be classified as a real property right, since it resembles a right more than the earlier described joint property unit. The space occupied by the joint facility can be seen as a form of common easement-like right for the participating stakeholder properties (Paasch, 2011).

The joint facility also regulates other issues such as how construction and maintenance costs are divided among the shareholders (SFS, 1973:1149). There are two different ways of managing a joint facility (SFS, 1973:1150, §4): Directly by the shareholders if there only are few shareholders (in Swedish: *delägarförvaltning*) or by a joint property association created for the purpose of managing the joint facility. If the shareholders directly manage the joint facility, they will have to agree on all decisions. A joint property association is a legal person consisting of the owners of the shareholder properties. The association manages the joint facilities in which the participating real properties have shares. The stakeholder properties in the joint facility have shares reminding of the share system of a joint property unit.

A joint property association is created by the cadastral authority, holding a founding meeting where the co-owners in the joint facility become members of the association and select a governing body and the articles of the association are decided (SFS 1973:1150). A yearly fee is normally to be paid by the members. The association articles describe what facilities that have to be managed, the responsibilities of the governing body and how the annual general meeting of shareholders shall be conducted. A revision of the association articles can only be done at the annual general meeting. The annual general meeting is the highest decision-making authority of the association. The association normally has one general annual meeting, but extra meetings can be scheduled, if needed. The governing body is elected at the annual meeting and responsible for managing the facilities in accordance with the facility order and for that an annual general meetings is held. The association can, in order to

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facilitate construction work and maintenance, demand additional funds from the members or take loans.

Not all condominium is created in buildings solely intended for housing. Several of them are created in buildings with mixed activities, such as housing, offices and shops. In those situations other legal solutions instead of the formation of a single joint property unit may be more applicable. Usually, one joint facility is formed for each condominium building, but if needed there can be several joint facilities within the same building complex, or one joint facility but with differentiated shares for separate parts of the condominium building.

Joint property associations are registered in the national Joint Property Associations Register (Lantmäteriet, 2016, ch. 5). Joint facilities should be registered in the national Real Property Register. The Real property Register contains information on all 2D and 3D real properties and numerous rights in accordance with the Real Property Register Act (SFS 2000:224), the Real Property Register Ordinance (SFS 2000:308) and the Real Property Formation Act (SFS 1970:988). It is a central register of major importance in Swedish land administration and evaluation.

Swedish 3D property units are given unique registration identifiers. The registration of condominiums is conducted in the same manner as traditional 2D property units. However, one specific difference in regard to 3D property and RRRs is that the boundaries of 3D property units and RRRs are defined by x, y and z coordinates, or defined by other types of textual description of the condominiums extent by referring to details on the construction drawing or other documentation. An example is that a condominium unit is located “between level “CA” +31.2 meters and level “CA” +55 meters“ (El-Mekawy, Paasch and Paulsson, 2014, pp. 21-22).

The condominium shares in the joint property unit(s) and joint facilities are registered in the Real Property register. The register consists of a textual part and the digital index map. The condominium unit is in the textual part marked as a 3D property with the additional information that it is a condominium unit. There is also a reference to the property formation dossier, which also has a unique identifier.

The spatial extension is subject to rudimentary registration in the digital cadastral index map. Only the footprint of the building is recorded together with cartographic text and identification number of the condominium units in “\ ”, e.g. “\1:9\”, and the cadastral boundary is visualised with a special layout, as shown in Figure 2.4.1.

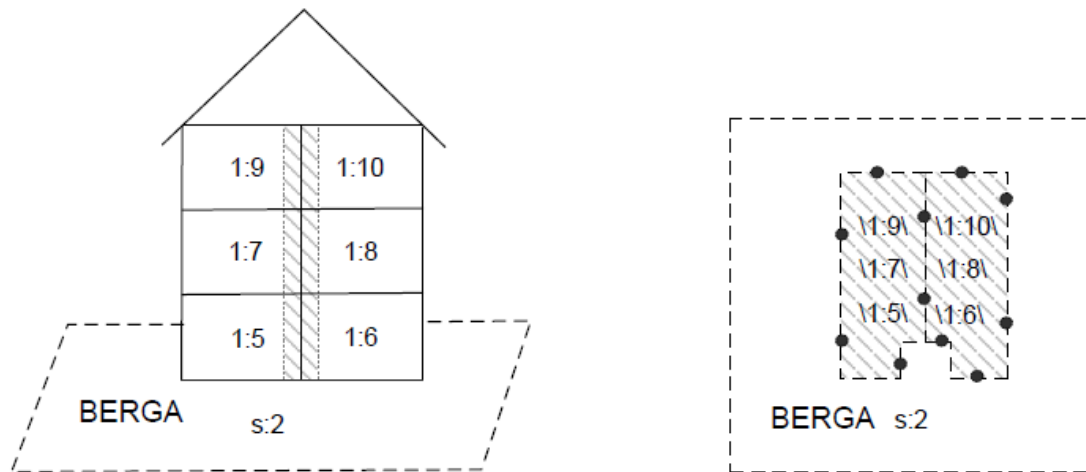


Figure 2.4.1 Cross section of building with 6 condominium units (left) and their registration in the cadastral index map (right) (Lantmäteriet, 2004)

The cadastral dossier, which is archived at the cadastral authority and registered in the Real property register, contains the legal documents involved, e.g. application, the property formation order, cadastral order and the necessary maps with illustrations of the spatial expansion of the condominium, joint facilities and joint property unit.

It is the task of the owners' association to create clear rules for management and take action against disturbances amongst the residents. It is also possible for the association to issue house rules for the use of the common property.

The general regulations for rights between neighbours are applicable also to condominium, but in addition there are some special rules concerning the possibility of access to the adjacent property for repairs, construction work, etc. The law also provides protection from insufficient maintenance or damage from the adjacent property. If occupants of the apartments units cause disturbances to an extent that it cannot be tolerated, the owner can be ordered under penalty that the disturbance should stop. It is, however, not possible to lose the ownership right.

2.4.1 The co-ownership shares in the Swedish condominium system

The condominium owners automatically become members of the association and have the right to vote. In the case where two persons co-own a real property having part in a joint property unit, they only have one vote since the share system is based on the participating real properties, not its individual owners, in accordance with the so-called method of principal number (in Swedish: *huvudtalsmetoden*). However, if the issue subject for the vote is of economic significance the votes shall be based on the shareholder properties' actual participatory shares in the joint property unit (in Swedish: *andelstalsmetoden*). This principle may lead to undemocratic decisions, if it was not for the limit that an individual member cannot execute more than 20% of the votes (SFS 1973:1150, §49).

The participatory shares in a joint facility can in some situations be changed by the steering committee of the joint property unit association, if they have been granted permission to do so by the cadastral authority SFS (1973:1149, §24). Other situations resulting in change in shares are when the shares are changed in cadastral procedures for a joint facility (*anläggningsförrättning*) or due to changes in the division of property units.

A participatory share in a joint facility is calculated for each condominium unit, based on how beneficial the joint facility is estimated to be for the condominium unit. In addition to this, a participatory share in the financial costs for operating and maintaining the joint facility is also calculated, based on to what extent the condominium unit is expected to use the facility. Swedish legislation (SFS, 1973:1149, §15) only specifies that the shares shall be divided fairly among the shareholders, but does not specify any method or parameters for calculating the shares. Neither do the existing guidelines for 3D real property formation or joint facilities from the cadastral authorities, e.g. Lantmäteriet (2018c), specify any methods. A recent survey (Blomberg and Söderqvist, 2017) noticed this lack of instructions from the cadastral authorities, which has resulted in different methods and parameters used for calculating participatory shares. This is in contrast to other guidelines for calculating shares for other types of joint facilities, for example joint facilities for roads (Lantmäteriet, 2018c, p. 115). As a result, different methods for calculation of shares is used by the cadastral authorities (Blomberg and Söderqvist, 2017). One method is that condominium units in a building are given the same participatory shares in the joint facility. Another method is that shares are calculated based on the condominium area, indicating that a larger area is equivalent with more people using the condominium unit, thus generating more wear on the common facilities in the building than smaller condominium units. Another example, again according to Blomberg and Söderqvist (2017), is that the floor number where the condominium is located has been used as parameter in the calculation, based on the principle that common installations such as stairs and elevators are used more frequently by residents and visitors accessing condominium units located higher up in the building than units on lower floors, thus generating more wear.

2.5 A general overview to the condominium system in Switzerland

The incidence of home ownership in Switzerland has been steadily rising in the last thirty years. Amongst the different forms of home ownership, condominium is by far the most popular. It has increased by 57%, according to a survey by the Swiss Federal Statistical Office 2010. In 2010, more than 37% of the newly constructed homes were buildings divided into condominium (Swiss Federal Statistical Office, 2010, p. 1). This lends itself to providing a clear understanding of the social and economic importance of condominium in Switzerland.

In Switzerland, the concept of condominium was introduced in 1965. According to the legislative intent, it is based on the general co-ownership provisions of the Swiss Civil Code (SCC), as a specially designed form of co-ownership. Property law is regulated in the fourth part of the Swiss Civil Code, sections 641 ss. SCC, whereas condominium is governed by sections 712a–712t SCC. Section 712a para. 1 SCC defines condominium as a co-ownership share in immovable property which gives the co-owner the special right to use and equip

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certain parts of a building exclusively. It can therefore be derived from this definition that the Swiss condominium can be attributed to the so-called “unitary system” that gives primary significance to the condominium owners’ co-ownership of the common property (van der Merwe, 2015, p. 5). This means that the Swiss Civil Code does not provide absolute exclusive ownership of the condominium unit as many other European countries do. Instead, it constitutes a right akin to ownership of a condominium unit (in German: *uneigentliches Stockwerkeigentum*). A condominium owner is simply a co-owner in relation to the whole building divided into condominium. Even the different condominium units within the building are held by all co-owners in common in undivided shares. A co-owner has only a special right to use his or her own condominium unit exclusively (in German: *Sonderrecht*), but no ownership thereof (BGE 132 III 9/11 cons. 3.1; Meier-Hayoz & Rey, 1988, section 712a SCC para. 7; Schmid & Hürlimann-Kaup, 2017, para. 1013; Wermelinger, 2010, section 712a SCC para. 13 s.). This special right of use accorded to each condominium owner with regard to a specific condominium unit is merely regarded as an indispensable imperative that had to be introduced in order to enable a peaceful coexistence within the condominium scheme. The significance of the co-ownership element can be seen from the contractual clauses with which ownership of the condominium unit is transferred. The subject matter of the contract clause is not the condominium unit as such, but the condominium ownership share with the special right:

“The vendor sells, transfers and waives all ownership and enjoyment of his condominium share no. 6563-5, with exclusive right of use according to the four-room apartment on the second floor, free and without any mortgage and interest, with the active and passive charges, to the purchaser, who accepts the transaction as per the terms of the clauses and conditions of the contract of sale.”

Unitary systems, or nuances thereof, have been adopted principally in legal systems that were traditionally unwilling to break completely with the maxim “*superficies solo cedit*” (van der Merwe, 1994, para 5-50). However, this comes at a cost since this rare dogmatic concept gives rise to a host of complex legal problems. Amongst others, it leads to a different perception of the co-ownership share, compared to other jurisdictions, which will be showed below.

Most legal systems distinguish between at least two distinct physical components of a condominium scheme, namely condominium units which are intended for exclusive use and the common parts of the property, destined to be used collectively. This is also the case in Swiss law. The Swiss Civil Code defines the common parts of the property inclusively. Section 712b para. 2 SCC entails a list of components that are to be considered common parts, as set out below:

II. Object

(...)

(2) The condominium owner cannot be granted special rights to the following:

1. the land of the property and the building lease under which the building may be constructed;

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2. the components that are important for the existence, construction and stability of the building or the rooms of other condominium owners or determine the external shape and appearance of the building;
3. the facilities and installations which also serve the other condominium owners for the use of their units.

In the deed of constitution or in a subsequent agreement, the condominium owners may stipulate that other parts of the building belong to the common parts of the property. If they do not do so, any parts not listed in section 712b para. 2 SCC are presumed to be the object of a special right of use (section 712b para. 3 SCC). This presumption contradicts the axiom of the unitary system according to which co-ownership (and not the special right of use) predominates.

As already mentioned, a Swiss condominium owner does not get absolute exclusive ownership of a condominium unit, but only a right akin to ownership, due to the unitary system. Section 712a para. 2 and 3 SCC grant a condominium owner the following rights and impose on him the following duties:

A. Definition and object – I. Definition

(...)

(2) The condominium owner is free in the administration, use and equipment of his own units, but may not make it difficult for any other condominium owner to exercise the same rights or in any other way damage the common parts, facilities and installations or impair their function and appearance.

(3) He is obliged to maintain his units as necessary to maintain the building in perfect condition and good appearance.

The special right (in German: Sonderrecht) leads to the result that the condominium owner is considered master of his condominium unit and he may administer, use and equip it according to his own taste. The object of a special right may be individual floors or parts of floors which must be self-contained, form an economic entity as apartments or as units and have an independent entrance (section 712b para. 1 SCC). Even a non-contiguous room (such as a cellar, an attic, a craft room or a toilet) can take the form of a condominium unit, as long as it is functionally and economically subordinate to the condominium unit. A condominium unit can be used for residential or for non-residential purposes (BGE 130 III 450/454 cons. 1.2; Schmid & Hürlimann-Kaup, 2017, para. 1020 ss.; Meier-Hayoz & Rey, 1988, section 712b SCC para. 45 ss.; Weber, 1979, p. 111 ss.; Wermelinger, 2010, section 712b SCC para 31 ss.).

Unlike in jurisdictions governed by the dualistic system, the distinction between condominium units and common parts of the property has no consequences in rem inasmuch as it does not allocate ownership rights (Swiss Federal Council, 1962, p. 1513). All condominium owners are co-owners in relation to the whole building divided into condominium. Therefore, the distinction between condominium units and common parts of the property has no impact on the property rights of the condominium owners. It would be wrong to assume, however, that in light of the unitary system, the distinction between condominium units on the one hand, and common parts of the property on the other, may be

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of little significance. On the contrary, the distinction plays a fundamental role in Swiss condominium law, since it undoubtedly has an influence on the special rights:

- The crucial question to be answered is whether or not the dividing floor, wall or ceiling performs a load-bearing function. If that is the case, the floor, wall or ceiling is presumed to belong to the common parts of the property (Meier-Hayoz & Rey, 1988, section 712b SCC para. 90 s.; Weber, 1979, p. 132). A condominium owner has neither an exclusive right of use, nor the power to administer, utilize and equip it according to his own taste.
- If the dividing floor, wall or ceiling has no load-bearing function, it may be object of the exclusive rights of use of the condominium owners involved (Weber, 1979, p. 79; Wermelinger, 2010, section 712b SCC para. 92 s.). To mark the boundaries between two condominium units, Swiss jurisprudence and doctrine do not consider the medial line of the dividing floor, wall or ceiling. Instead, they deem the interests of all of the condominium owners concerned to be worthy of protection and as such take them into consideration (Meier-Hayoz & Rey, 1988, section 712b SCC para. 90 s.; Weber, 1979, p. 132 ss.). The exclusive right of use of one condominium owner is only restricted by the exclusive rights of use of the other condominium owners (see section 712a para. 2 SCC).

As already mentioned, the unitary system and the so-called right akin to ownership of a condominium unit raise complex dogmatic questions. This can be illustrated on the basis of a decision of the Swiss Federal Supreme Court in which it had to adjudicate on constructional measures on the common parts of a property divided into condominium, more specifically on the extension of a garden seating area assigned to a designated condominium unit (BGer 5C.110/2001, 15 October 2001). The court came to the conclusion that the extension of the garden seating area would not only increase the value of the corresponding condominium unit, but also the value of the entire property. For this reason, the expansion of the garden seating area also serves the condominium owners' community and, consequently, the other condominium owners. In the light of the unitary system this is logical. However, this does not change the fact that condominium units on the real estate market are valued differently, namely individually. When it comes to selling a condominium unit on the third floor, for instance, such unit does not benefit at all from any expansion of the garden seating area of the condominium unit on the ground floor, regardless of the fact that the entire building is co-owned by all condominium owners. This shows the extent to which the legal concept and practical implementation of condominium ownership are drifting apart (Schwery, 2016, p. 153).

Condominium is created by entry into the land register (section 712d para. 1 SCC). The clerk in charge of the land register opens a land register folio for every single condominium unit. In this way, each condominium unit will be allocated a designated land register number. However, for a condominium to be entered into the land register, a deed of constitution is required. This can take the form of either a contract between the co-owners regulating the constitution of their shares as condominium or a declaration by the owner of the property or the owner of an independent and permanent building right regarding the formation of co-

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ownership shares and their constitution as condominium (section 712d para. 2 SCC). In order to be valid, the deed of constitution must be notarised publicly or, if it is a disposition by will or a contract of distribution of the estate among coheirs, it must take the form prescribed by inheritance law. The deed of constitution must contain the following three components: Firstly, the will of the condominium owners to constitute their shares as condominium, secondly the plan of division and thirdly the share allotted to each condominium unit (BGE 132 III 9/12 cons. 3.2; Meier-Hayoz & Rey, 1988, section 712d SCC para. 71; Schmid & Hürlimann-Kaup, 2017, para. 1027; Swiss Federal Council, 1962, p. 1515 s.). The share must be expressed as fractions with a common denominator (section 712e para. 1 SCC). In Switzerland, regulation in the deed of constitution with regard to future buildings (in German: Verkauf ab Plan, the sale of condominium units off plan) is not only permitted, but also frequently occurring and very popular (Schmid Meyer, 2015, chapter 1 para. 2; Stöckli, 2009, p. 2).

As far as administration is concerned, a fundamental distinction must be made between the special rights on the one hand and the common parts of the property on the other hand. As already mentioned, the condominium owner is basically free in the administration, use and equipment of his own condominium unit (section 712a para. 2 SCC). Conversely, it can be concluded that the common parts are not managed by the individual condominium owners, but by the condominium owners' community. The latter is formed by all condominium owners. It has no legal personality. However, it has a so-called "limited legal capacity": The condominium owners' community can acquire, in its own name, the assets arising from its administrative activities, in particular the claims for contributions and the funds available from them, such as the renewals reserve (section 712l para. 1 SCC). It can also sue and pursue as well as be sued and pursued in its own name (section 712l para. 2 SCC). The aim of the condominium owners' community is to ensure the joint management of the condominium. In performing this joint management function, the condominium owners' meeting plays the most fundamental role. In particular, it has the power to decide in all administrative matters which do not fall upon the administrator, to appoint the latter and supervise his or her activities and to elect a committee or a representative to whom it may delegate administrative matters. The condominium owners' meeting also annually approves the budget, the accounts and the distribution of costs among the condominium owners and it decides on the creation of a renewals reserve for maintenance and renewal work (section 712m para. 1 SCC). It is entitled to the establishment of a lien against each respective condominium owner on his share for the claims for contributions over the last three years (section 712i para. 1 SCC). In addition, the condominium owners' community has the same right of retention as a landlord over movable property located on the premises of a condominium unit owner which forms part of the condominium unit's installation or use, for the claims for contributions over the last three years (section 712k SCC).

2.5.1 The co-ownership shares in the Swiss condominium system

The above-mentioned unitary system and the related right akin to ownership of a condominium unit leads to a different perception of the condominium share, compared to other jurisdictions. In jurisdictions where the law confers on the condominium owners real

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and genuine ownership, the participation quota refers to the quantification of a condominium owner's share in the common parts of the property. In Swiss law, though, not only the common parts of the property, but the whole building (including all of the condominium units) is co-owned by all condominium owners. Hence, the condominium share is defined in section 712e para. 1 SCC as follows:

II. Layout of the condominium units and shares in the property

(1) The deed of constitution shall indicate the spatial segregation and the share of each condominium unit in the value of the property or building right, expressed as fractions with a common denominator.

(...)

That means that according to Swiss jurisprudence and doctrine, the condominium share is a numerical quantification of a condominium owner's share in the whole property (and not only in respect of the common parts of the property, see Meier-Hayoz & Rey, 1988, section 712e SCC para 4 ss.; Stadlin, 2017, p. 83 ss.; Wermelinger, 2010, section 712e SCC para. 9 ss.). This is a fundamentally different approach to the definitions of participation quota in other jurisdictions. However, that different approach has little impact in practice. The ratio expressed by the numerical quantification remains the same whether it refers only to the common parts or to the whole property.

The condominium share plays a fundamental role in different areas: It has to be taken into consideration before a condominium owners' meeting, as the condominium share may be a condition for the quorum of the general meeting. Section 712p SCC states the following:

3. Quorum

(1) The condominium owners' meeting is quorate if half of all the condominium owners, half of whom must be entitled to a share, but at least two condominium owners, are present or represented.

(2) If the condominium owners' meeting does not have a quorum, a second meeting must be convened, which may not be held within ten days of the first meeting.

(3) The second condominium owners' meeting has a quorum if the third part of all condominium owners, but at least two, are present or represented.

The condominium share also constitutes the numerical basis for the determination of financial obligations since condominium owners must contribute to the expenses in respect of the common parts of the property and to the costs of the communal administration in accordance with their shares (section 712h para. 1 SCC). Eventually, the condominium share may also matter in the case of the cancellation of the condominium in terms of section 712f SCC. Since the condominium share determines the condominium owner's undivided share regarding the land and the building, it has considerable significance in the event of the cancellation of the condominium.

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According to the wording of section 712e para. 1 SCC, the share and the value that each condominium unit represents are inextricably linked: “The deed of constitution shall indicate (...) the share of each condominium unit in the value of the property or the building right (...)” (section 712e para. 1 SCC). Therefore, the value of the land and the building in general and the relative value of each condominium unit in particular play a role in the determination of the condominium share (even though they do not have to be congruent). This leads to the question of how the value of a condominium unit is to be determined:

- a) In terms of section 712e para. 1 SCC, the value of the building and the land are relevant. Therefore, the developer’s initial capital investment would provide a reliable (though not necessarily sufficient) indicator, as it might provide a reference as to the quality of the housing (especially the quality of the construction material used and the quality of the construction work performed). One limitation that should be mentioned, however, is that the market value should be taken into account with caution as it depends on the laws of the real estate market and is therefore rather volatile (see the decision of the Swiss Federal Supreme Court BGE 116 II 55/60 cons. 5b; Schmid, 1972, p. 98; Stadlin, 2017, p. 85). Condominium shares should be determined with a long-term view. Therefore, the market value would not constitute a reliable basis for the determination of the condominium share.
- b) As the jurisprudence and the doctrine recognise the importance of the diligent determination of the condominium shares, they have established (non-mandatory) methods to calculate and allot condominium shares.
 - As a first step, the condominium share is determined with reference to so-called quantitative-objective factors. These may include primarily the relative size of the condominium units, which is usually specified with reference to the floor area of the different units. However, the cubic area may also be taken into account. The number of rooms and the rent value, though, are usually not taken into consideration.
 - As a second step, so-called qualitative-subjective factors would apply to refine the results calculated on the basis of the quantitative-objective factors. These qualitative-subjective factors include the location, infrastructural advantages, sufficient light and view (Müller, 1965, p. 170 s.; Stadlin, 2017, p. 86; Weber, 1979, p. 149).
- c) As the diligent determination of the condominium shares is not only fundamental, but also, time and again, a source of conflict between condominium owners, a parliamentary initiative is now being discussed in Parliament. The law commission is considering, amongst other measures, introducing a provision that obliges the developer to disclose the formula by which he determines the condominium share in the Swiss Civil Code (Caroni, 2014).

This has constituted a short overview of the definition and determination of Swiss condominium shares. As mentioned above, they should be determined with a long-term view and should therefore not be altered easily. This being said, circumstances that call for an alteration of the size of a condominium share may occur. For such cases, section 712e para. 2 SCC states that changes in shares require the consent of all parties directly involved and the approval of the condominium owners’ meeting. However, if the directly involved parties do not consent or if the condominium owners’ meeting does not approve, then each condominium owner is entitled to seek rectification, but only under one of two conditions,

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namely that either the condominium share has been defined incorrectly by mistake or that, due to structural modifications to the building or its surroundings, the condominium share is no longer accurate. For part of the doctrine, the condominium share being no longer accurate is not sufficient; it is additionally required that the other condominium owner would suffer a significant disadvantage in the case of non-alteration of the size of the condominium share (see Rey, 1979, p. 132).

To conclude and illustrate the above explanations on the determination and calculation of Swiss condominium shares, a simplified calculation example is presented, based on the following components (the calculation is based on the example described by Schmid, 1972, p. 99; for other calculation examples see Müller, 1965, p. 170 s.; Wermelinger, 2010, section 712e SCC para. 62 ss.): The example assumes a multi-storey building, cf. Table 2.5.1 below, and focuses on the first floor with a two-, a three- and a four-room apartment. Only the condominium unit no. 103 has a supplementary separate room. The calculation of condominium unit no. 101 below proceeds as follows:

The starting point is the ideal floor area of the condominium unit no. 101 ($B_8 = 62 \text{ m}^2$). One then multiplies the qualitative-subjective factors ($B_{10} \times B_{11} \times B_{12} \times B_{13} \times B_{14} \times B_{15}$) to obtain the final coefficient with regard to the qualitative-subjective factors ($B_{16} = 0.9589$). For geographical orientation, the following table sets different coefficients for each direction: 1.00 for the south and the south-west; 0.91 for the north; 0.97 for the east; 0.98 for the west and 0.95 for the north-east and the north-west. It is thus similar with the location and with the view for which the following coefficients are used: 1.00 if the condominium unit faces the main street; 0.94–0.98 if the condominium unit faces the side road and 0.85–0.95 if the condominium unit faces the inner courtyard.

After having calculated the final coefficient with regard to the qualitative-subjective factors ($B_{16} = 0.9589$), one then multiplies the latter with the ideal floor area of the condominium unit no. 101 in m^2 ($B_8 = 62 \text{ m}^2$) to get the relative value of the condominium unit no. 101 ($B_{17} = 59.45366$).

After having calculated the relative value of every condominium unit, one adds all these relative values ($E_{17} = 249.75346$). One then converts the calculation result in thousandths: $1000 / \text{sum of relative value of all the apartments}$ ($E_{17} = 249.75346$) \times relative value of the condominium unit no. 101 ($B_{17} = 59.45366$) = participation quota in thousandths ($B_{18} = 238.049395$). The condominium unit no. 101 must therefore be assigned a condominium share of 238/1000.

Table 2.5.1 An example for the calculation of shares in the Swiss condominium

	A	B	C	D	E
1	Condominium unit number	101	102	103	
2	Number of rooms	2	3	4	
3	Floor area of the apartment (m^2)	55.87	70.38	100.32	
4	Ideal floor area of further spatial locations in m^2				
5	Separate room to 0.85			7.43	

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6	Basement to 0.5	4.06	5	4.06	
7	Balconies to 0.5	2.07	2.07	4.53	
8	Ideal floor area of the condominium unit in m²	62	77.45	11.34	
9	Qualitative-subjective factors				
10	Geographical orientation	0.95	1	1	
11	Location and view	0.98	1	1	
12	Height above ground	1	1	1	
13	Layout	1.03	1	0.97	
14	Accessibility	1	1	1	
15	Use	1	1	1	
16	Final coefficient (with regard to the qualitative-subjective factors)	0.9589	1	0.97	
17	Relative value of the condominium unit	59.45366	77.45	112.8498	249.75346
18	Condominium share in 1/1000	238.049395	310.105814	451.884791	1000

2.6 A general overview to the condominium system in the Netherlands

Unlike the French Code Napoleon that was in force in the Netherlands between 1811 and 1838, the first Dutch Civil Code of 1838 lacked a legal basis for condominiums. This was because – as mentioned by the secretary of commission that drafted the Code – there was no practical need for separate ownership of storeys in the Netherlands (Ploeger, 1997, p. 221).

However the possibility to create apartment ownership and its legal alternatives, were discussed by legal experts in the first half of the 20th century (Beekhuis, 1940; Van Velten, 2017, nr. 337-339). The need for apartment ownership became really urgent after the serious losses of buildings faced by several Dutch cities during World War II. As most land owners would not be able to reconstruct their destroyed houses or shops, the construction of apartments offered an solution for a fast reconstruction of Dutch cities (Van Velten, 2017, nr. 340).

Per 1 December 1952 the Dutch Civil Code was supplemented with the articles 638a-638t, offering the possibility to create apartment ownership (or to be more correct: the splitting of a building with land into ‘apartment rights’). In 1972, based on the first experiences, this regulation was amended on a number of points. Important changes were the introduction of a mandatory association of owners and need to register a drawing (splitting drawing, in Dutch a *splitsingstekening*) in the land registry. In 1992 the existing law became part of the New Dutch Civil Code, as Title 9, Book 5 (articles 106-147, Book 5). Since then the rules have

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been updated several times (in 2005, 2011, 2017) on minor points in order to solve practical problems or needs. E.g. from 2005 onwards it is possible to create apartment rights for land without any buildings (e.g. parking spots or harbor units). Also several articles are introduced to stimulate that the apartment complex will be kept in good maintenance. In addition the Dutch Housing Act contains some provisions relating to the regulation of maintenance of apartment complexes.

In everyday language anyone will speak about an ‘apartment owner’, and also the Dutch Civil Code itself uses this expression (e.g. article 106, Book 5 Civil Code). However this is from a legal point of view misleading, because the Dutch system is based on the unitary system. The right of apartment in Dutch law is based on common ownership of the whole building and the land, and therefore the ownership of an apartment as such is unknown in the Netherlands. Each holder of a ‘right of apartment’, created by the ‘transformation’ (the splitting) of the real estate, holds a share in a co-ownership of building and land.

An right of apartment is therefore a property right with special characteristics. To be more precise, the right of apartment includes three core elements (Akkermans, 2008, p. 286-287; Van Velten, 2017, nr. 343-347):

- a share in the ownership of a building (or buildings) and the land (the ‘apartment complex’);
- the exclusive right to use a certain part of that complex, called the ‘private part’. This use right is not a property right itself (and cannot be sold or transferred as such), but is an accessory right to the share in the community.
- the mandatory membership of the association of owners (*Vereniging van Eigenaars*, VvE).

Even in the case all the apartment rights (and therefore the shares in the community) are held by one person or one entity (e.g. the developer of the apartment complex), these rights are separate and distinct property rights (Akkermans, 2008, p. 288). The property rights (the rights of apartment) are created at the moment of registration of the master deed (*splitsingsakte*, literally. ‘deed of splitting’) in the land register. This deed must be drafted by a Dutch civil law notary.

Before registration of the master deed the Netherlands Kadaster will issue the notary a ‘complex number’. In some sense this replaces the existing parcel number(s) of the land that will be splitted in apartment rights. Each apartment right is individualized in the land administration by reference to a cadastral number. E.g. Amsterdam D, 1329, A1. In this system the first number is the complex number (here 1329), followed by the apartment index number (A1, etc). This master deed must include a description of the separate private parts, also by reference to the mandatory drawing that provides (on scale) an overview of the complex and the boundaries of the private parts. Also in the drawing each private part must be numbered. These numbers are used in the master deed and the land administration to individualize the ‘apartment rights’.

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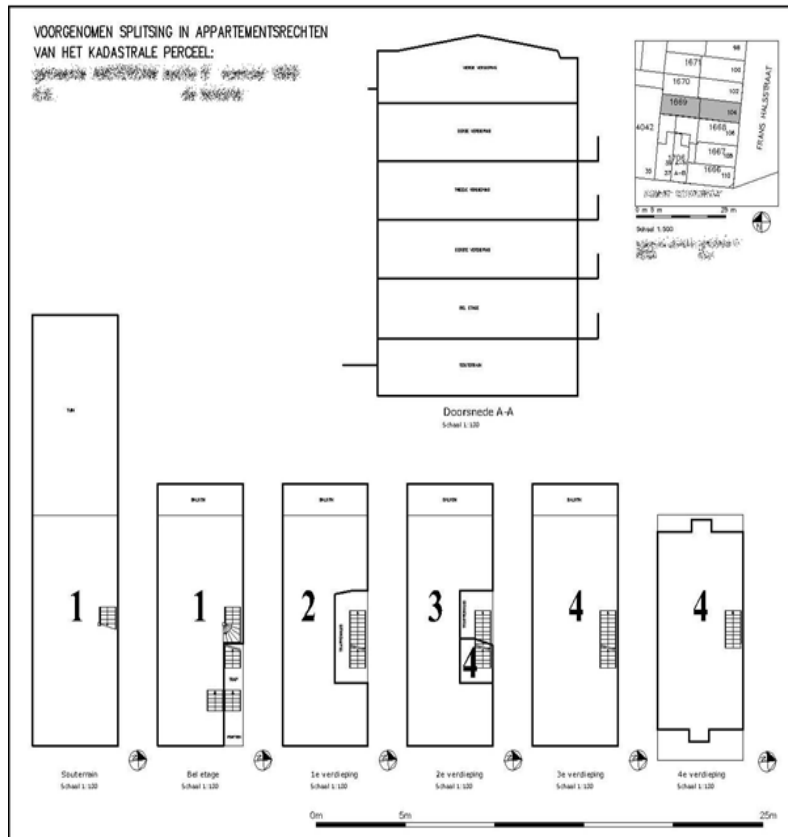


Figure 2.6.1. Example of a drawing (“splittingssteking”) providing an overview of the apartment complex. The boundaries of the private parts are indicated by a thick black line.

2.6.1 The co-ownership shares in the Dutch condominium system

The share that each of the holders of a right of apartment has in the community of land and building(s) is an indivisible share. Every apartment owner must, pursuant to article 113, paragraph 2, Book 5 Dutch Civil Code contribute towards the association of owners and the other apartment owners to the debts and costs that, according to the master deed, are borne by the joint apartment owners. E.g. in the case of payment of a fee for a ground lease, the duty for payment is divided among the holders of the apartment rights.

According to article 113, paragraph 1 Book 5 Civil Code the property shares are in principle the same. Also the obligation to contribute to the common debts and costs is in principle the same for every apartment owner (article 113, paragraph 2, Book 5 Dutch Civil Code). However the master deed can specify different shares. This will indeed be the case in most apartment complexes. However, nor the Civil Code, nor the applicable cadastral instructions, give any guidance how to calculate the shares. Article 113, paragraph 1 Book 5 Civil Code just stipulates that the master deed must provide the basis on which the property shares are calculated. However for the division of the shares in the common debts and costs such an obligation is even absent.

In practice for the property shares reference will be made to more or less objective standards, such as floor size, or the original selling price of the apartment (Van Velten, 2017, nr. 430). In most cases the distribution of the common debts and costs will be based on the same share each apartment owner holds in the community. But this is not necessarily. The contribution can be arranged in such a way that different types of costs are borne by different owners. Such a distribution of costs is particularly justified if the costs are related to the use of a certain part of the apartment complex. E.g., it is possible to have the costs of maintenance of a common elevator only be paid by the apartment owners who will use the elevator.

However for the common debts and costs it often proves difficult to find a good basis for the distribution. This in particular the case if not all private parts have the same use (e.g. homes, offices and business premises), or are located in different buildings. Because the master deed can only be changed with the consent and collaboration of all apartment owners, or with a majority vote by the association of owners (a majority that must be at least 80%, article 139, Book 5 Civil Code) it is not trivial to make changes in the shares afterwards.

2.7 A general overview of the condominium system in Turkey

The Turkish condominium is regulated by the Condominium Act (*Kat Mülkiyeti Kanunu*, KMK) 634 of 1965 and amendments made later in this act. It corresponds to the principles of ‘dualistic system’ which integrates the individual ownership of an apartment and co-ownership of the common property into a composite ownership (cf. van der Merwe, 2015, p. 6; 2016, p. 132). Even though the adoption of a ‘unitary system’ which was most consistent with the provisions of the Turkish Civil Code (*Türk Kanunu Medenisi*) of 1926 had been advocated by legal scholars, KMK was codified according to the principles of ‘dualistic system’ (Oğuzman et al., 2009, p. 487). The inconsistencies between KMK and the Turkish Civil Code of 1926 were resolved by the new civil code accepted in 2001.

The condominium unit is regarded a type of immovable property in the Turkish Civil Code (*Türk Medeni Kanunu*) of 2001. Currently, 19 390 637 condominium units, which constitute about 25% of 77 025 340 immovable properties of Turkey, are registered by the General Directorate of Land Registry and Cadastre⁷.

A condominium is a special form of ownership related to the co-ownership share and common places (KMK, Article 3). It is composed of the private ownership of condominium units and co-ownership of common places. The private ownership of the condominium units may be in the form of individual ownership, co-ownership, or joint ownership defined in the Turkish Civil Code. The condominium can be established on immovable properties that include buildings having at least two physically divided units which can be used individually and independently. A provisional condominium (*kat irtifakı*) can also be established on unbuilt properties to be constructed in the future and become a condominium when the construction is completed and the building occupancy permit is issued (KMK, Article 3).

⁷ <https://www.tkgm.gov.tr/#>

In the Turkish condominium, the immovable property where condominium is established is termed as the main property (*ana taşınmaz*) and the structure itself as the main building (*ana yapı*). The Condominium Act categorizes the legal parts of the main property as the condominium unit (*bağımsız bölüm*), common place (*ortak yer*), and accessory part (*eklenti*) (KMK, Article 2). These legal parts are explicitly specified in the architectural drawing, which is one of the constitutive documents for the establishment of condominium.

The condominium unit is the part of the main property intended for independent and exclusive use, such as an apartment, office, shop, store, cellar, and warehouse. The measure of the independence and exclusivity is related to the intended use of the condominium unit. For instance, an apartment to be registered as an condominium unit has to provide facilities which an ordinary apartment provides, such as kitchen, bedroom, and bathroom. Moreover, each condominium unit has a co-ownership share in the common places; a division in which the co-ownership share has not been allocated cannot be considered as a condominium unit. A condominium unit may consist of more than one contiguous or non-contiguous division on the same or different floors provided that these divisions are of the same use type or need each other to perform the function of the condominium unit. The condominium unit does not necessarily need to be bounded by walls, floor and ceiling. Some non-isolated spaces, such as tennis courts and swimming pools may also be registered as condominium units as long as they individually fulfill the intended use (cf. the judgement of 5th Civil Chamber of the Court of Cassation, 16/06/1981, E. 4267, K. 6861). Such places may also be designated as a common place or accessory part (see below). The location and area, interior partitions, type of use, co-ownership shares, and accessory parts of the condominium units are specified in the architectural drawing and the condominium deed.

The Turkish Development Bylaw for Planned Areas (*Planlı Alanlar İmar Yönetmeliği*) defines a number of area types for the condominium units which should be calculated by the project architect. These include the net area, the gross area, the total gross area, and the general gross area. The *net area* of the condominium unit is defined as the area enclosed by the interior walls, while the *gross area* refers to the area enclosed by the outer contours of the condominium unit.

The outer contours are exterior side of building walls and middle axle of the walls between condominium units and common places. The *total gross area* covers the gross area of condominium unit and the gross area of accessory parts assigned to the unit, and the *general gross area* consists of the total gross area and the area share of the condominium unit in the common places.

The next legal part in the Turkish condominium is the common places which are co-owned by the condominium owners proportionally to the co-ownership shares of their condominium units. According to KMK, the common places include the parcel, building facilities, and installations located outside the condominium units and serve to protect and facilitate the common use of the main property. The common places may be determined in the condominium deed. However, the act provides a list of building components and installations which are, in any case, deemed to be common places as follows; (a) structural components

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(e.g. the foundations and walls, ceiling and floors, yards, main entrance doors, corridors staircases, elevators, roofs, chimneys, and terraces), (b) joint facilities (e.g. common laundries and drying rooms, common garages, and central heating rooms), and (c) installations located outside condominium units (e.g. sewers, central heating, water, gas and electric supply, and telecommunication networks) (KMK, Article 4). The outer walls, floors and ceilings of balconies are also included in the common places. In addition, the spaces or components which are not listed in the act but are indispensable for the common protection and use are deemed as common places. In practice, it is assumed that components of the main property are common places unless they are specified in the architectural drawing as a condominium unit or accessory part.

The last legal part is the accessory part that is outside the condominium units but directly allocated to the exclusive use of a specific condominium unit; for example, parking lots, cellar, and storage rooms can be specified as accessory parts, but components which are indispensable for common protection and use cannot be designated as accessory parts. An accessory part can only be allocated to one condominium unit and is considered as the inseparable part of that unit. Therefore, the ownership right on the condominium unit also covers the accessory part(s) allocated to this unit (KMK, Article 6). The boundaries of the accessory parts, their types of use, and condominium units that are allocated are indicated in the architectural drawing and the condominium deed.

The main property is managed by the assembly of condominium owners (*kat malikleri kurulu*) (KMK, Article 27) according to the resolutions taken in accordance with the provisions of the act, the condominium deed, and the bylaw (KMK, Article 32). The daily management tasks can be entrusted to a manager or management board which may be appointed from the owners or professional building management company (KMK, Article 34). Condominium owners are mutually obliged to comply with the rules of equity, and in particular, not to disturb each other, not to violate their reciprocal rights, and to conform to the provisions of the bylaw (KMK, Article 18). They are also mutually obliged to maintain the main property and to preserve its architectural condition, beauty, and solidity. No construction and repair to the common places can be made without the consent of four-fifths of the owners. Additionally, condominium owners cannot undertake any repair, modification or installation in their own condominium units, which may damage the main property (KMK, Article 19).

The condominium is created by the registration made to the condominium book (*kat mülkiyeti kütüğü*) by the land registry (KMK, Article 11). Each condominium unit is registered in a separate folio of the condominium book in which the address, use type, allocated co-ownership shares and accessory parts (if any), and rights in rem and in persona related to the condominium unit are recorded in the specified sections. To the establishment of condominium, the following documents are required:

- a) The architectural drawing (*mimari proje*) which is prepared by the project architect, approved by the relevant public authorities (e.g. municipalities), and signed by the owners of main property (KMK, Article 12a).

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- b) The bylaw (*yönetim planı*) determines the method of management, manner of use, the remuneration of the manager(s) and auditors, and other details regarding management. It has the force of a binding agreement on all condominium owners . The bylaw has to be signed by the owners of main property and may only be modified with the consent of four-fifths of condominium owners (KMK, Article 12b, 28).
- c) The condominium deed (*sözleşme*) which is an authenticated document for the establishment of a condominium is prepared by the land registry according to the application documents and signed by the owners of main property (KMK, Article 13).

Moreover, as for the cadastral registration, cadastral plans for buildings and condominium units should have been prepared before the establishment of the condominium. These plans include the layout plan (*vaziyet planı*) and the condominium unit plan (*bağımsız bölüm planı*) which are prepared by (licenced or private) cadastral surveyors and approved by the cadastral organization. The layout plan shows (Figure 2.7.1, left side) the legal boundaries of buildings, while condominium unit plan (Figure 2.7.1, right side) demonstrates the legal boundaries and locations of condominium units and their accessory parts.

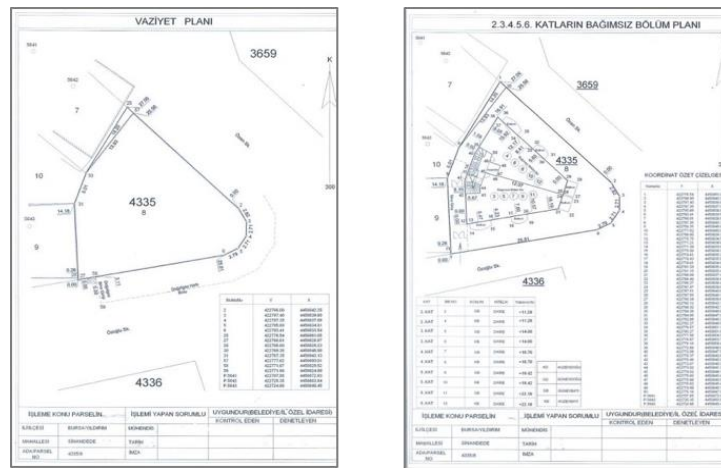


Figure 2.7.1 An example of a layout plan (left) and a condominium unit plan (right)⁸

2.7.1 Co-ownership shares in the Turkish condominium system

A condominium is a special form of ownership which is related to the co-ownership shares (*arsa payı*) and common places in the main property (KMK, Article 3). The condominium unit and its co-ownership share are inextricably linked; thus, the co-ownership share cannot be transferred or conveyed separately from the condominium unit (KMK, Article 5). The co-ownership share is the main determinant for the use of common places, management of the main property, and the contributions to the cost and expenses made for the main property, as detailed below.

The co-ownership share determines the ownership shares of the condominium units in the common places. The owners of the condominium units have the right of use to the common

⁸ http://www.hkmo.org.tr/resimler/ekler/4f19115dfa286fb_ek.zip?tipi=2&turu=H&sube=4

places in proportion to the co-ownership shares of their units, unless otherwise specified in the condominium deed or the bylaw (KMK, Article 16).

The co-ownership share also has important functions in the management of the main property. The quorum for the general meeting of the assembly of condominium owners is determined based on the number of owners and the co-ownership shares of their condominium units. The general meeting is quorate if attended by more than half the owners representing more than half the total co-ownership shares (KMK, Article 30). At this meeting, the decisions are taken based on majority votes. The owner of an condominium unit has one vote; an owner who has more than one condominium unit has a separate vote for each unit but not exceeding one-third of all votes (KMK, Article 31). The following issues require decisions to be taken by a majority of the owners with more than half the total co-ownership shares: (a) Appointing a manager or managerial board (KMK, Article 34), (b) appointing an auditor or an auditory board, and (c) renewing and making additions to common places (KMK, Article 42). The unanimous resolution of all owners is needed for following issues: (a) Changing the use type of condominium units (e.g. from residential to commercial) (KMK, Article 24), (b) modifying existing co-ownership shares in the event of creating a new condominium unit (KMK, Article 44), (c) restricting the main property with a limited property right (e.g. easement and right of way), subdividing the parcel, transferring the subdivided part to third parties, and renting common places (e.g. external walls for advertisement) (KMK, Article 45), and (d) converting the heating system (e.g. from a central system to individual unit system) (KMK, Article 42).

The expenses entailed for cleaning, gardening, door keeping, and security are shared equally among the owners, while the cost and expenses made for maintenance, protection and repairing the common places, operation costs of the common installations, and salaries of managers are shared proportionally to the co-ownership shares. However, different provisions can be made in the condominium deed or the bylaw. Owners cannot withhold from paying their share of costs and expenses by desisting from their right to use the common places or by stating that they do not benefit from some installations (KMK, Article 20). For instance, an owner whose condominium unit is located on the ground floor cannot refrain from contributing to the expenses made for elevator maintenance (Oğuzman et al., 2009, p. 532). In terms of the insurance of the main property, the condominium owners are obliged to contribute to the charges in proportion to their co-ownership shares (KMK, Article, 21). Similarly, if the main property is expropriated, the compensation will be distributed among the owners based on the co-ownership shares of their condominium units. Also, revenue gathered from the common places (e.g. renting external walls of the main building for advertisements) is distributed to the owners according to the co-ownership shares. Lastly but more importantly, the co-ownership shares will specify undivided ownership shares of the condominium owners in the parcel and building, when the condominium deed is terminated or the main building has been completely destroyed.

KMK stipulates that the co-ownership share is calculated according to the values of condominium units at the date of registration of the condominium. The co-ownership share of each condominium unit is calculated by dividing the value of condominium unit to the

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aggregate value of all condominium units in the main property. Both the values of the condominium units and the co-ownership shares are determined by the project architect and shown in the architectural drawing. The co-ownership shares determined by the project architect are subject to the approval of all condominium owners at the date of establishment of the condominium in the land registry. If the co-ownership shares have not been allocated proportionally with the values of condominium units at the date of registration, owners may apply to the court to alter their co-ownership shares. The co-ownership shares cannot be modified due to any increases or decreases in the values of condominium units in future (KMK, Article 3).

Neither the type of value nor the method of valuation to be applied is defined in the Turkish Condominium Act. In practice, the relative values of condominium units are taken as the basis for the calculation of co-ownership shares. The valuation date is the date of the registration of condominium; therefore, any changes made in the condominium units after the registration cannot be taken into consideration. Only the two criteria of location and size are mentioned in the act in terms of the valuation of condominium units. However, the Court of Cassation of Turkey indicates other criteria that should be taken into account in specifying the co-ownership shares, such as the type of condominium units (e.g. residential and commercial), number of floor, floor area, location, heating system, lighting, view, allocated accessory parts, and external effects; e.g. daylight and wind (cf. the judgement of 18th Civil Chamber of the Court of Cassation, 05/02/2009, E. 2008/10404, K. 2009/700; 17/02/2009, E. 2008/1313, K. 2009/1268). However, it is not clear how these theoretically correct valuation criteria would be applied in the assessment of the condominium units.

The co-ownership shares can be modified by a unanimous resolution of the assembly of condominium owners. In addition, they are modified when a new condominium unit is created, for instance by constructing a new condominium unit in the main property (KMK, Article 44). In both cases, the land registry entry of the existing condominium is terminated and a new condominium is created based on a new architectural drawing which shows the modified co-ownership shares of condominium units. If all condominium owners do not consent to the modification of co-ownership shares, the co-ownership shares may be altered by the court decision upon the application of the owner(s) who claim(s) that the co-ownership shares have not been allocated proportionally to the values of the condominium units at the time of the registration of the condominium. According to the jurisprudence of Court of Cassation of Turkey, the owners who were present at the registration and signed the application documents are deemed to have consented to the co-ownership shares calculated by the project architect, and therefore cannot demand the alteration of co-ownership shares. However, third parties who became condominium owners after the registration may apply to the court to alter the co-ownership shares.

The way in which the co-ownership shares are calculated is probably one of the most controversial issues of the Turkish condominium system. Even though the act clearly indicates that the co-ownership shares must be based on the relative values of the condominium units, a scientifically sound and societally acceptable valuation methodology

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has not been developed to date. Therefore, the valuation of condominium units is open to the subjective judgements of the project architect who may not possess expertise concerning property appraisal. In practice, generally their determination is based on the floor areas of the condominium units used for residential purposes and on the discretion of the project architect for commercially used units in mixed use condominiums. Since there is a lack of awareness on this matter, the co-ownership shares determined by the project architect are generally accepted by the condominium owners. However, while the first generation of condominiums are going toward the end of their economic life, disputes related to co-ownership shares are emerging especially in urban renewal projects where the rights and obligations of condominium owners will be mainly based on the co-ownership shares.

3. A COMPARATIVE ANALYSIS OF THE ALLOTMENT OF CO-OWNERSHIP SHARES

3.1 General remarks

The condominium concept is regulated in Denmark by the Act on Owner Apartments 1966 with later amendments; in Germany by the Condominium Act 1951; in South Africa by the Sectional Titles Act 1971 and the Sectional Titles Schemes Management Act 2011; in Sweden by the Land Code 2009 and other related acts; in Switzerland by the Swiss Civil Code 1907; in the Netherlands by the Dutch Civil Code amended in 1952; and in Turkey by the Condominium Act 1965. In Switzerland and the Netherlands, a ‘unitary system’ is applied while other jurisdictions being reported have systems corresponding principles of ‘dualistic system’ which combines the individual ownership of a flat and co-ownership of the common property. In the Netherlands and Switzerland, the condominium concepts refers to the co-ownership share in immovable property that gives the co-owner the special right to use certain condominium units exclusively.

The condominium is generally divided into the condominium unit and the common property. A condominium unit, which is also represented by the term of ‘unit’ in South Africa, consists of a main part and a co-ownership share. In Denmark, Switzerland and Turkey, a condominium main part may consist of one or more contiguous or non-contiguous building parts. But some places, such as such as carports, parking lots, storage rooms which are assigned to use of specific condominium units as ‘accessory part’ (see below), cannot be included into a condominium in Denmark and Turkey. In South Africa, a section, which is the main part of the unit, may include adjoining parts of the building such as balconies, atriums or projections and also non-adjoining parts for example in the basement of the building such as parking spaces and storage areas. In Sweden, the condominium main part cannot consist of more than one area or space. The readers are referred to the previous section for more detailed descriptions about the coverage of the floor areas and the boundaries of the condominium units.

The common property, which is represented also by the terms of ‘joint property’ and ‘joint facility’ in Sweden, ‘common parts’ in Switzerland and ‘common places’ in Turkey, refers to land and building parts which are co-owned and jointly used by the condominium owners.

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The Swiss and the Turkish legislation provide classifications for spaces or building components which are deemed to be common property. Accordingly, it may include the land, structural components (e.g. the foundations, main entrance doors and corridors, staircases, elevators, roofs), joint facilities (e.g. common garages, swimming pools, gardens, tennis pools), and installations (e.g. sewers, central heating, water, gas and electric supply, and telecommunication networks). In Swedish legislation, the common property can consist of joint property and/or a joint facility (cf. Section 2.4).

In some jurisdictions some building parts (e.g. garage, cellar, and storage room) can be assigned to specific condominium unit for use. In Denmark, such components may be ordinary parts of the condominium concerned, while in Turkey they are called ‘accessory part’ and ‘exclusive use area’ in South Africa. In Turkey, an accessory part can be allocated to only one condominium unit and is considered as the inseparable part of that unit. Accessory parts or exclusive use areas are specified through the bylaws or an easement in Denmark; the sectional plan or the condominium scheme in South Africa; the condominium deed and the architectural drawing in Turkey. In the Swedish condominium system, the condominium units can be granted the right to use individual parts of the joint property through for example easements.

The condominium is established by an entry made in the land registry. The condominium unit is regarded as immovable property and recorded at separate folio of the land registry (e.g. register of apartment ownership and register of unit ownership in Germany, condominium book in Turkey, real property register in Sweden) in all investigated jurisdictions. In Sweden, joint property associations are also registered in the Joint Property Associations Register. The constitutive legal documents include the statement, the condominium scheme and maps in Denmark; the architectural drawing (partition plan) and the building permit certificate in Germany; the sectional plan in South Africa; the application, the property formation order and the cadastral order in Sweden; the statement, the architectural drawing, the condominium deed, the bylaw and the cadastral plans in Turkey; the deed of constitution in Switzerland.

3.2 The co-ownership shares

The concept of co-ownership share refers to the ownership share in the common property in Denmark, Germany, South Africa, Sweden and Turkey; while in Switzerland and the Netherlands it refers to the ownership share in the whole immovable property including land and all of the condominium units. This legal concept is also represented by the terms of ‘participation quota’ in South Africa, ‘participatory share’ in Sweden, ‘condominium share’ in Switzerland, and ‘property share’ in the Netherlands.

In Denmark, the co-ownership shares matters in the distribution of shared costs, distribution of votes at the general assembly of the owner association, as well as owner's share of the value of joint land, building and facilities. The costs and expenses made for the common property are distributed among the owners proportionally to their co-ownership shares. Also, votes at the general assembly are counted according to co-ownership shares. In South Africa, the share value (co-ownership share) determines contributions to the maintenance, repair and

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administration of the common property and amenities. It also determines the value of the vote of the owners for the adoption of ordinary resolutions at the general meetings. Furthermore, the quorum for a general meeting (of a scheme consisting of four or more primary sections) requires the presence in person of the members entitled to vote and holding one third of the total votes of members in value (co-ownership shares). A sectional owner's quota is also relevant in determining the percentage of owners who may require that a special general meeting be convened. In Switzerland, the condominium share refers to a numerical quantification of a condominium owner's share in the whole property (and not only in respect of the common parts of the property). It is a condition for the quorum of the general meeting and constitutes the numerical basis for the determination of financial obligations. Moreover, it has considerable significance in the event of the cancellation of the condominium since the condominium share determines the condominium owner's undivided share regarding the land and the building. In Turkey, the co-ownership share determines the shares of the condominium units in the common places, and power of votes of condominium owners in the management of the main property. The quorum for the general meeting of the assembly of condominium owners is determined based on the number of owners and the co-ownership shares of their condominium units. Finally, the cost and expenses made for maintenance, protection and repairing the common places are shared proportionally to the co-ownership shares.

3.3 Calculation methods of co-ownership shares

The co-ownership share is calculated on the basis of the value (e.g. Switzerland and Turkey) or a combination of the area and the value of condominium units (e.g. Denmark, South Africa). Only in Sweden, participatory shares are calculated based on for example estimated benefits derived from joint facilities. The determination of the co-ownership shares is under the responsibility of different actors, namely the owner of the mother property in Denmark (likely assisted by unspecified professionals), the developer in South Africa and Switzerland, the project architect in Turkey, and the cadastral authority in Sweden.

In Denmark, there is no clear provision for the establishment of co-ownership shares. According to a ministerial circular, the co-ownership shares should reflect the relative value of the condominiums. The floor area is suggested as a point of departure, when condominiums are used for same purpose, e.g. residence, but relative market value should be used for relating e.g. residential and commercial condominiums.

In Germany, §17 WEG refers to the division of shares once the community of owners ceases to exist. This is an implicit way of calculating the shares. Crucial is perhaps the minimum size of an apartment. In the case of the annulment of the Community of apartment owners, the proportion of co-owners is determined by the ratio of the value of their residential rights at the time of the annulment of the Community. If the value of a co-ownership share has changed due to measures, the costs of which have not been borne by the apartment owner, such a change shall not be taken into account in the calculation of the value of this share.

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In South African condominium, co-ownership shares for residential and non-residential schemes are determined based on the relative floor area and the relative value, respectively. In the case of residential sections, the share is objectively determined by dividing the floor area of a particular section by the aggregate floor areas of all the sections in the development. Not only the floor area of the main portion of a section but also the floor area of the other parts of a section such as a contiguous balcony or similar projection, and non-contiguous parts like a garage or storeroom, are taken into account. In the case of non-residential sections, the developer is solely responsible for the determination of the co-ownership shares. He or she allocates the co-ownership share of non-residential sections in the scheme. In practice it often happens that the developer determines the co-ownership shares in non-residential sections on the basis of their relative floor area. In the case of mixed-use schemes, the developer allocates a percentage of the total quotas (share values) to the residential units and then distributes the allocated quotas to the residential units in accordance with their relative floor areas. The remaining part of the quotas is shared amongst the non-residential sections according to their values by the developer. Since there are no legal provisions on the valuation procedures, the calculation of co-ownership shares of non-residential units depends on subjective judgements of the developer both in non-residential schemes and mixed use schemes.

In Sweden, a participatory share in a joint facility is calculated for each condominium unit, based on for example how beneficial the joint facility is estimated to be for the condominium unit. In addition to this, a participatory share in the financial costs for operating and maintaining the joint facility is also calculated, based on to what extent the condominium unit is expected to use the facility. The Swedish legislation only specifies that the shares shall be divided fairly among the shareholders, but does not specify any method or parameters for calculating the shares. As a result, different methods for calculation of shares are used by the cadastral authority as explained in Section 2.4.1.

In the Swiss condominium system, the value of the land and the building in general and the relative value of each condominium unit in particular play a role in the determination of the condominium share. In the Swiss jurisprudence and the doctrine, non-mandatory methods have been developed based on several quantitative-objective and qualitative-subjective factors. In these methods, the shares are calculated by taking into account the quantitative-objective factors, which include relative size (e.g. floor area or cubic area) of the condominium units, and by refining the results with qualitative-subjective factors which include location, infrastructural advantages, sufficient light and view, as exemplified in Section 2.5.1.

In the Dutch condominium, the property shares are in principle the same. However the master deed can specify different shares. This will indeed be the case in most apartment complexes. However, nor the Civil Code, nor the applicable cadastral instructions, give any guidance how to calculate the shares. The Dutch Civil Code just stipulates that the master deed must provide the basis on which the property shares are calculated. However for the division of the shares in the common debts and costs such an obligation is even absent.

In the Turkish condominium, the co-ownership shares must be calculated according to the relative values of condominium units. The co-ownership shares are determined by the project architect based on relative values of condominium units at the date of registration and subject to the approval of the owners of the main property. The criteria to be taken in the valuation of condominium units include type of condominium units (e.g. residential and commercial), number of floor, floor area, location, heating system, lighting, view, assigned accessory parts, and external effects; e.g. daylight and wind. Even though the act clearly indicates that the co-ownership shares must be based on the relative values of the condominium units calculated according to above-mentioned criteria, a scientifically sound and societally acceptable valuation methodology has not been developed to date. Therefore, in practice, co-ownership shares are determined generally based on the floor areas of the condominium units used for residential purposes and on the discretion of the project architect for commercially used units in mixed use condominiums.

3.4 Modification or alteration of co-ownership shares

The modification or the alteration of the co-ownership shares in some specific circumstances is allowed in Denmark, South Africa, Switzerland and Turkey. In Denmark and Turkey, the co-ownership shares may be modified through a unanimous resolution of the owner association and the assembly of condominium owners, respectively. Moreover, in Turkey the co-ownership shares may be altered by the court decision upon the application of the owner(s) who claim(s) that the co-ownership shares have not been allocated proportionally to the values of the condominium units at the time of the registration. However it should be stressed that the shares cannot be altered due to any increases or decreases in the values of condominium units occurred after the registration. Similarly, in Switzerland, the alteration of condominium shares is allowed in specific circumstances. But such changes require the consent of all parties directly involved and the approval of the condominium owners' meeting. If the directly involved parties do not consent or if the condominium owners' meeting does not approve, then each condominium owner is entitled to seek rectification, but only under one of two conditions, namely that either the condominium share has been defined incorrectly by mistake or that, due to structural modifications to the building or its surroundings, the condominium share is no longer accurate. In South Africa, the alteration of ownership shares is not allowed, but the weight of the vote of a sectional owner, and an owner's proportionate contributions and liability may be modified. South African and Turkish legislations also allow modification of co-ownership shares in the cases of subdivisions and amalgamation and the extension of condominium units, and the demolition of one or more condominium units. In Sweden, the participatory shares in a joint facility may be modified, which is normally made by application to the cadastral authority.

3.5 Discussion

Concluding this section, it appears that most of the jurisdictions have a condominium system which stipulates calculation of co-ownership shares based on relative values of the condominium units. The Swiss and the Turkish legislation and jurisprudence indicate a number of criteria to be taken into account in the valuation of condominium units, yet existence of a formal, standardized and uniform valuation method which may enable a fair

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calculation of co-ownership shares has not been observed. It seems valuation of condominium units is left to the subjective discretion of owners (with professionals) in Denmark, developers in South Africa and Switzerland, and project architects in Turkey. A step towards a more formalized approach is taken by the United States, requiring the developer to state the formulas used to establish the allocation of the co-ownership shares (see p. 16 above). Similarly, a Swiss law commission is considering a provision that obliges the developer to disclose the formula applied (p. 31). Moreover, a formalization of the allocation of ownership shares also presupposes a specification of the context and use of the shares. For example, to what extent costs are distributed according to the shares or according to other criteria, e.g. individual use of laundries, garden or parking lots, or consumption of water, power, etc. In order to prevent malpractices, licensed professionals, who have to comply with professional standards and ethical norms, may be authorized in the determination of co-ownership shares.

4. THE CONDOMINIUM SYSTEMS IN INTERNATIONAL GEOGRAPHIC INFORMATION STANDARDS

There are several international information standards which includes specifications related to the condominium, such as ISO Land Administration Domain Model (LADM), OGC Land and Infrastructure Conceptual Model Standard (LandInfra), OGC CityGML, OGC IndoorGML and the Industry Foundation Classes (IFC) data model. Among these, only two ISO LADM and OGC LandInfra focus on the legal aspect of condominiums; while others related to the physical aspect of structures. The literature also presents a number of modelling initiatives that extend or adapt these physical information models to the requirements of the national condominium system, such as Dsilva (2009), Çağdaş (2013), Gózdź et al. (2014), Li et al. (2016) and Atazadeh et al. (2017). This paper omits jurisdiction specific extension models, and concentrates on the international geographical information standards which model both the legal and the geographical aspects of the condominium.

4.1 LADM of the International Organization for Standardization (ISO)

The ISO 19152:2012 Land Administration Domain Model (LADM) is an abstract conceptual model that focuses on the legal and geographical aspects of land administration. It consists of Administrative Package, Spatial Unit Package, and Party Package. The Administrative Package defines the recording units of land administration (LA_BAUnit); and rights (LA_Right), restrictions (LA_Restriction), and responsibilities (LA_Responsibility) established on basic administrative units. The Spatial Unit Package and its Surveying and Representation sub-packages deal with spatial units (e.g. cadastral parcels, legal space building units, and legal space utility networks), and their geometric/topological representation based on ISO and OGC standards. Its specialized subclasses LA_LegalSpaceBuildingUnit and LA_LegalSpaceUtilityNetwork allow for the representation of legal spaces related to building units and utility networks, respectively. Finally, the Party Package includes the LA_Party class, which represents natural and legal persons, and the LA_GroupParty class representing the groups consisting of a number of parties both of which play a role in land administration.

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The above-mentioned LADM classes, their attributes and relationships support modeling legal divisions of the condominium (e.g. condominium units), their spatial representations, relevant parties (i.e. condominium owners), and documents related to condominium (e.g. condominium deed). The main class of LADM, LA_BAUnit enables representation of individually owned or exclusively used condominium units which may consist of one or more non-contiguous spatial units. LA_SpatialUnit and its specialized LA_LegalSpaceBuildingUnit subclass are used for the modeling of these spatial units. LADM also includes a code list class, LA_BuildingUnitType which includes more generic values (i.e. individual and shared) for the legal classification of the building parts or divisions. As for the boundary representation of the legal parts, LA_BoundaryFace class can be used. But as indicated by Atazadeh et al. (2017), LADM does not provide semantically rich specifications for the boundaries of condominium parts. Accordingly, neither boundary types (e.g. wall boundary surface, ceiling boundary surface), nor boundary location (e.g. interior, exterior or median of the physical structure) used in architectural drawings or partition plans can be defined by LADM (p. 96). However, via LA_SpatialSource, the LA_BoundaryFace can obtain the actual geometry and topology information, including the boundary location, from architectural drawings or partition plans.

LADM may also allow representation of parties in the condominium (e.g. condominium owners, owner association, body corporate or joint property association, community of apartment owners) through LA_Party and LA_GroupParty classes, and representation of condominium documents (e.g. condominium schemes, condominium deeds, bylaws, deed of constitutions, sectional plans, architectural drawings or partition plans) through LA_SpatialSource and LA_AdministrativeSource classes. However, code lists specified for these classes do not accommodate values for the identification of different types of parties and documents related to the condominium. The intention is that the generic code lists of LADM are further extended when needed

As regards co-ownership share, an adequate modelling is being discussed. The co-ownership share is generally allocated according to the relative area or the relative value of condominium units. The area of legal building units are modeled with the area attribute defined in LA_SpatialUnit class. LADM also provides a LA_AreaType code list class which accommodates different types of area including calculated area, non-official area, official area and surveyed area. However, a further categorization is needed for more detailed area types, such as gross area or net floor area used for the calculation of co-ownership shares in different jurisdictions. The national and international area and volume measurement standards (e.g. ISO 9836:2011 Performance Standards in Building, IPMS for Office Buildings, IPMS for Residential Buildings) might be consulted for extending area types defined in LADM. As for the information needed by the value-based allotment systems, LADM presents an external valuation class (ExtValuation) which is expected to be developed by further studies. An ongoing research initiative which aims at developing a LADM based Valuation Information Model (Kara et al., 2017) may fulfill this gap.

LADM is now being revised by ISO TC211. It is hereby suggested to include in the revised second version of LADM the co-ownership share, and moreover to provide the area and value information required for the calculation of co-ownership shares. Furthermore, semantically richer code lists for legal division types (e.g. condominium unit, accessory parts), boundary types (e.g. interior, exterior or median), party types (e.g. owner association, body corporate or joint property association) and document types (e.g. condominium deed, bylaw, deed of constitution) related to condominium should be considered in the revision.

4.2 LandInfra / InfraGML of the Open Geospatial Consortium (OGC)

The development of LADM was informed by previous standardization efforts within the cadastral domain. These include the LandXML, an open XML data exchange standard for the civil engineering, survey and transportation industries (Hecht, 2004). The Open Geospatial Consortium (OGC) in 2012 noted that no work was done to advance the standard since 2009; also, the LandXML data format was currently not being supported by a standards organization, and not being integrated with any of the OGC standards (<http://www.opengeospatial.org/blog/2098>). Consequently, the OGC - synchronized with concurrent efforts by buildingSMART International in their development of infrastructure-based Industry Foundation Classes (IFCs) - initiated a standardization effort which resulted into the Land and Infrastructure Conceptual Model Standard (LandInfra) in 2016 and a set of OGC InfraGML LandInfra Encoding Standards in 2017. The following summarizes provisions of these standards with focus on condominiums.

The subject areas of the LandInfra standard comprise facilities, projects, alignment, road, railway, survey, land features, and land division. Facilities here regards infrastructure (road, railway) rather than buildings (cf. the standard's definition 4.2.3 civil engineering works) which are included only to a limited extent (LandInfra, 1. Scope). The layout of infrastructure needs specifications on alignment and on survey. The standard's section on survey is quite elaborate, encompassing all types of above ground surveys, but the following is restricted to the section on *Land division*, which addresses cadastral and condominium issues.

LandInfra divides land into *LandDivisions*. These can either be public (political, judicial, or executive) or private in nature. The former are *AdministrativeDivisions* and the latter are *InterestsInLand*. The geometrical shape of these *SpatialUnits* is modelled independently from their administrative or legal status (LandInfra, section 7.10.1).

4.2.1 LandInfra on Interest in Land

An *InterestInLand* is ownership or security towards real property. Ownership of land extends to the ownership of all buildings stably erected on the land, as well as fixtures and plants. As a general rule with many exceptions, the vertical scope of ownership extends to the earth below the land, and to the sky above the land as is needed for the enjoyment of that land. Ownership includes the right to give a lease, an easement, or a security interest. Easement stands out, because it generally does not apply to the same spatial borders as ownership. Therefore, the type *Easement* is introduced (see LandInfra, section 7.10.2.7 and [Figure 62](#)). This type may be applied also for profit à prendre (the right to take something off the land of another), for

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leases which do not apply to a whole *PropertyUnit*, and for certain charges by determination of law (LandInfra, section 7.10.2).

The abstract class *InterestInLand* is documented by a *Statement*, while the shape and location of an *InterestInLand* is defined by *SpatialUnit*. *InterestInLand* types include *PropertyUnits* and *Easements* in the above-mentioned wide sense (LandInfra, section 7.10.2). *PropertyUnits* are further specialized into *LandPropertyUnit* which specifies ownership to a part of the surface of the Earth, identified through one or more *LandParcels*, and into *CondominiumUnits*, which comprise one or more *BuildingParts*.

A *Statement*, a specialization of *Document*, documents the establishment or acquisition of an *InterestInLand* or a *Survey Monument* in accordance with the specific *StatementType*, e.g. *condominiumSchemeEstablishment* or *condominiumAcquisition*. A *Statement* document is signed by one or more *Signatories*, each with a specific *SigningRole*. Attributes include *landRecordingDocumentID*: the document identification issued by the concerned land recording agency (land registry, cadaster, or land administration agency, as dependent on jurisdiction), as the *Statement* is assumed to have been or to become recorded (LandInfra, section 7.10.4).

LandInfra models *Signatories*, cf above, and also *Professional* with *ProfessionalDataType*, and *Ownership*, but has no general *Party* concept as LADM.

LandInfra defines *SpatialUnit* as a contiguous geometrical entity, which is delimited and located on or close to the surface of the Earth through its *BoundingElements*. *AdministrativeDivision*, *LandParcel*, *Easement*, and *BuildingPart* all refer to *SpatialUnit*. The dimension of *SpatialUnit* is specified by its *DimensionType*: 2D, 3D, or liminal (LandInfra, section 7.10.6, [Figure 66](#)). *SpatialUnit* is specified through one or more *BoundingElements*, which allow for an array of representation methods not detailed here (cf. LandInfra, [Figure 67](#)).

4.2.2 LandInfra on Condominium

The standard conceives Condominium as concurrent ownership of real property that has been divided into private and common portions. Condominium unit owners must be members of a mandatory owners' association and engage in the maintenance of joint facilities according to a specified share (LandInfra, section 7.11).

LandInfra motivates the Condominium part by reference to LandXML which includes Building as a 'parcel format' and among other capabilities provides the recording of lot entitlements and liability apportionment for owners' corporation, body corporate or scheme land entity. ISO LADM similarly reflects a need for recording of condominium schemes through its *LA_LegalSpaceBuildingUnit*. The OGC CityGML Standard allows for recording buildings, and an Application Domain Extensions (ADE), the CityGML Immovable Property Taxation ADE, specifies relations between land parcel, building, and condominium parts (Cagdas, 2013). IndoorGML regards building and building parts used for access. Finally,

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building SMART's Industry Foundation Classes (IFC) specifies building and their parts in detail. – The demonstrated need and the developed CityGML Immovable Property Taxation ADE motivated the inclusion into LandInfra of the Condominium Requirements class (LandInfra, section 7.11).

The *CondominiumScheme* subdivides the floors of a multi-storage *CondominiumBuilding* into *BuildingParts* according to management and use, thereby drawing upon the *IfcSpatialZone* class (with reference 5.4.3.51) of IFC. The *BuildingParts* intended for exclusive ownership have either type *condominiumMainPart* or *condominiumAccessoryPart*. The joint facilities are either of type *jointAccessFacility* e.g. staircase, lift, or *jointOtherFacility*, e.g. laundry, heating facility. Each of the exclusively owned units has access to building entrance through one or more *jointAccessFacilities* (LandInfra, section 7.11.4; [Figure 69](#)). *BuildingPart* refers to *SpatialUnit*, which again is specified through one or more *BoundingElements*. Condominium boundary types (e.g. interior, exterior or median) may be indicated through an optional *BoundingElement* attribute: *description* of type *CharacterString* (LandInfra, section 7.10.7), but probably the application of other parts of LandInfra, e.g. *PhysicalElement* and the corresponding *PositioningElement* (LandInfra, section 7.3.1.5-7), provides for a more appropriate solution in accord with the Industry Foundation Classes of buildingSMART International. - The standard notes that 'Some jurisdictions allow the owner of a *CondominiumUnit* exclusive rights to a parking lot with surveyed boundaries on the concerned *LandParcel*. In this standard, such parking lot does not qualify as a *LandParcel*, because the condominium owner cannot alienate rights in the parking lot independently of the rest of the *CondominiumUnit*.' (LandInfra, section 7.11.5).

The *CondominiumUnit* has among other attributes: *shareInJointFacilities*: the fraction by which the *CondominiumUnit* is bound to engage in the maintenance of joint facilities, including roof, outer walls, access areas, technical installations, and the *LandParcel* on which the building rests (LandInfra, section 7.11.1). The *CondominiumBuilding* is located on a *carrierParcel*, one of the possible *LandParcelStates* (LandInfra, section 7.10.2.5).

As mentioned, owners of *CondominiumUnit* must be members of a mandatory owners' association. Different from LADM, the scope of LandInfra does not include the modelling of parties and memberships (LandInfra, Annex D.2). Consequently, LandInfra does not mention the bylaws of owner association among *Statements*. Exclusive rights for specific *CondominiumUnits* to parking lots, garden lots, or similar, may in some jurisdictions be stated in the bylaws of the owner association. In such cases, the bylaw - or better: an annex, describing the identifier, location, use, and area of the lots - might be included among the *Statements* to be submitted to the Land Registry. The specification of the exclusive rights should be part of the bylaws, also to be protected by the stricter voting rules for changing bylaws: unanimously or at least special majorities (cf. Merwe, 2015, p. 60f).

4.2.3InfraGML

The standardization target type for InfraGML is software applications which read/write data instances, i.e. XML documents that encode land and survey data for exchange. An application

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conforming to InfraGML shall support the LandDivisionXML elements in accordance with the InfraGML XSD specified in the schema repository of the Open Geospatial Consortium.

During implementation of the conceptual models of LandInfra in InfraGML it was decided in two cases to adjust the relationships of BuildingPart, cf InfraGML, section 7.3.1.

5. CONCLUSION

This paper focuses mainly on description of legal issues related to allotment of co-ownership shares which is probably the most important but often ignored aspect of the condominium. The general content of condominium systems and methods applied for the allotment of co-ownership shares are documented for Denmark, Germany, South Africa, Sweden, Switzerland, the Netherlands and Turkey, and compared. Except for South Africa, which applies a ‘hybrid’ legal system, all jurisdictions described belong to the civil law legal system. It also appears that Denmark, Germany, South Africa, Sweden, and Turkey have regimes that comply with the principles of ‘dualistic system’ where a condominium owner has an exclusive ownership right in the condominium unit and a undivided share in the common property. A ‘unitary system’ are applied in Switzerland and the Netherlands in which a condominium owner is a co-owner of the whole immovable property divided into condominium, and has only a special right of use with regard to the condominium unit concerned. The concept of co-ownership share in Switzerland and the Netherlands means therefore the share in the whole property consisting of the land and of all the condominium units, while in other investigated jurisdictions, it is understood as the share in the common property. This legal concept is also represented by the terms of ‘participation quota’ in South Africa, ‘participatory share’ in Sweden and ‘condominium share’ in Switzerland.

The comparison demonstrated that the co-ownership shares are determined by a number of actors in the investigated jurisdictions, namely the owner of original property in Denmark (as advised by professionals), the developer in South Africa and Switzerland, the project architect in Turkey, the civil law notary in the Netherlands and the cadastral authority in Sweden. Aside from Sweden, co-ownership shares are calculated on the basis of the values of condominium units in Switzerland and Turkey, and a combination of the areas and the values of condominium units in Denmark and South Africa. In Sweden, participatory shares are calculated based on estimated benefits derived from joint facilities. A few jurisdictions indicate criteria to be taken into account in the valuation of condominium units, such as Switzerland and Turkey, yet the existence of a formal, standardized and uniform valuation methodology which may enable a fair calculation of co-ownership shares has not been observed. In the Netherlands the section of criteria is left to the notary (and ultimately his client, in most cases a developer). A step towards a more formalized approach is taken by the United States, requiring the developer to state the formulas used to establish the allocation of the co-ownership shares (see p. 16 above). Similarly, the Swiss law commission is considering a provision that obliges the developer to disclose the formula applied (p. 31). International valuation organizations may see a challenge in developing guidelines for appropriation of co-ownership shares, which are scientifically solid and acceptable from a

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social point of view, as this may provide a basis for the development of national provisions for fairer allotment of co-ownership shares. Moreover, in order to prevent malpractices, jurisdictions may be concerned that licensed professionals, who have to comply with professional standards and ethical norms, become authorized to determine co-ownership shares.

This paper also recorded the extent to which land administration related international geographic standards addressed the representation of condominium and co-ownership shares. For this purpose, the ISO Land Administration Domain Model (LADM) and the OGC Land and Infrastructure Conceptual Model Standard (LandInfra), which model both the legal and the spatial aspects of the condominium, have been investigated. While the former is an international land administration standard covering aspects related to surveying and recording of immovable properties, the latter is related to civil engineering infrastructure facilities, surveying, and related aspects of land development. The investigation showed that both standards model condominium and condominium parts. However, LandInfra provides a semantically richer code list (i.e. *condominiumMainPart*, *condominiumAccessoryPart*, *jointAccessFacility*, *jointOtherFacility*) for the description of condominium parts, while a corresponding code list class in LADM: *LA_BuildingUnitType*, presents a more generic classification (i.e. individual and shared). LADM allows for representation of parties (e.g. condominium owners, owner association, body corporate or joint property association) in the condominium through *LA_Party* and *LA_GroupParty* classes, and representation of condominium documents (e.g. condominium schemes, condominium deeds, bylaws, deed of constitutions, sectional plans or architectural drawings) through *LA_SpatialSource* and *LA_AdministrativeSource* classes. Yet, the code lists specified for these classes should be supported with values which will enable identification different types of parties and documents related to the condominium. Parties as a general concept have not been specified in LandInfra, which models *Ownership*, and *Professional* with *ProfessionalDataType*. Condominium documents are modelled through *Document* and *Statement*, the latter with attribute *StatementType*, e.g. *condominiumSchemeEstablishment* or *condominiumAcquisition*, and further attributes *Signatory* and *SigningRole*. The co-ownership share is modelled in LandInfra with a *shareInJointFacilities* attribute defined for the *CondominiumUnit* class, which is not made explicit in LADM.

The above observations suggest that LADM, which is now being revised by ISO TC211, should be supported with an optional co-ownership share attribute. Also semantically richer code lists for legal division types, boundary types, party types and document types related to condominium should be accommodated by the next version of LADM. LandInfra/InfraGML seems to comply with the spatial aspects of condominium documentation needs of the described jurisdictions, and is aligned with the Industry Foundation Classes of buildingSMART International. The only reservation applies to the missing Party class, which does not hamper its application and use.

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Volkan Çağdaş has been working in Yildiz Technical University (YTU), Department of Geomatic Engineering, Istanbul / Turkey. He obtained his Ph.D. degree in 2007, and then studied as a post-doc researcher at Aalborg University under the supervision of Prof. Dr. Erik Stubkjær. In 2010, he became an assistant professor in YTU, and in 2014 he was awarded an associate professorship in cadastre and land administration. He has been teaching cadastre, immovable property law, land re-adjustment, immovable property valuation, and land information management systems at undergraduate and graduate levels. His research interest covers the technical and the institutional aspects of cadastre and land administration.

Erik Stubkjær is emeritus professor, having served as professor of cadastre and land law at Department of Development and Planning, Aalborg University 1977 – 2008. Recently, he

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engaged in standardization activities, contributing to OGC standards LandInfra and InfraGML (2016/17). He initiated in 2001 the research project ‘Modelling Real Property Transactions,’ supported by European Science Foundation as COST action G9. Taking an institutional economics perspective, the project framed the modelling of transactions in real estate, e.g. the purchase of real property, mortgaging, and cadastral processes, as basis for assessing transaction costs. He graduated as land surveyor in 1964. During 1979-1988, he was member of the Tribunal of the Danish Association of Chartered Surveyors.

Walter Timo de Vries is chair land management at the faculty of civil, geo and environmental engineering at the Technical University Munich. His research interests include smart and responsible land management, public sector cooperation with geoICT and capacity development for land policy. Key themes in his most recent publications advances in responsible land administration, mergers of cadastres and land registers, capacity assessment methodologies for land policy and neocadastres.

Cornelius van der Merwe, an ex-Dean of the Law Faculty of the University of Stellenbosch, is a Senior Research Fellow at the University of Stellenbosch and a Professor Emeritus of Civil Law of the University of Aberdeen. He held visiting professorships at the University of Tulane, La Laguna in Tenerife, Seoul National University, Kyushu University, the University of Tsinghua and the University of Shandong. He held a Rhodes scholarship, Von Humboldt and Max Planck stipendia, a scholarship of the Fellowship of the Japan Society for the Promotion of Science and the MacCormick Fellowship of the University of Edinburgh. He wrote the chapters on *Apartment Ownership and Security in Immovable Property* for the International Encyclopaedia of Comparative law and has published widely on strata titles and the law of property in national and international law journals. He is the chief editor of *Time Limited Interests in Land* (2012) and *European Condominium Law* (2015) for the Trento project on the Common Core of European Private Law. He acted as legal consultant for the South African government on the introduction of an Ombud service to solve disputes in strata title schemes. The Community Schemes Ombud Service Act was promulgated in 2011 modelled on a draft prepared by Professor van der Merwe and two other consultants.

Jesper M. Paasch is a senior lecturer/associate professor at the University of Gävle and coordinator of research in geographic information at Lantmäteriet, the Swedish mapping, cadastral and land registration authority, Gävle, Sweden. He holds a MSc degree in Surveying, planning and land management, a Master of Technology Management degree in Geoinformatics, both from Aalborg University, Denmark, and a PhD degree in Real Estate Planning from the KTH Royal Institute of Technology, Stockholm, Sweden. His thesis concerned the development of the Legal Cadastral Domain Model. He is a Swedish delegate in FIG, Commission 3, and was a delegate in the drafting team of ISO 19152:2012 LADM. He is a member of the FIG joint commission 3 and 7 working group on „3D-Cadastres“.

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Ümit Işıklıdağ has his MSc in Civil Engineering and PhD (from the University of Salford) in Construction Information Technology with his work on integration of BIM with 3D GIS. His research interests include BIM / IFC, 3D GIS, Internet of Things, RESTful Architectures, BIM 2.0, and Spatial Web Services. He is lecturing in Mimar Sinan Fine Art University and actively involved in the organization of 3D GeoInfo and GeoAdvances Conferences, editorship of International Journal of 3D Information Modeling, and also serving as the Secretary of ISPRS WG II/2.

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