Introductory chapter to: Real Property Transactions; Procedures, Transaction Costs and Models, Zevenbergen, Frank and Stubkjaer (eds.)

Modeling Real Property Transactions—An Overview

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1. Introduction

The focus of the research reported about in this book is the transfer of ownership and other rights in land and buildings. Land and buildings are of vital importance to society. Ownership rights determine how land is used and by whom; other important property rights are attached to land. The institution "real property rights" regulate the function of land in society within the limits of the constitution and public laws of each country. Real property markets are influenced by the cost of transactions in real property.

Real property transactions transfer real property rights between people. The rules controlling real property transactions determine when and who may transfer which property rights to whom. Because land and buildings are so important, society has included safeguards to regulate real property transactions; they must follow specific procedures. The research project aimed first for a comprehensive and comparable description of real property transaction across European countries and assessed and compared in a second step the costs related to these transactions.

The different legal traditions in different European countries created terminological and semantic difficulties to achieve a comparable description. Moreover, the land and real property transactions are the object of different scientific disciplines, where each sees particular—and often incompatible—aspects of the land: planning, architecture, economy, surveying. The project used a systematic and semi-formal approach to modeling real property transactions with methods developed by computer scientists and produced comparable step-by-step descriptions for real property transactions for several European countries.

Transaction costs are the sum of the cost of each procedural step and fees. Fees are simple to determine and the seller and buyer must pay them to a state agency or a consultant he hires. This viewpoint of the parties interested in the transaction does not give the full picture because substantial costs are born by the public. The comparison of the cost between countries showed substantial differences and revealed alternative "philosophies" of controlling land.

The COST Action G9 "Modeling Real Property Transactions" started in 2001 and brought together researchers from all disciplines involved and from 12 European countries. Through various meetings and publications the questions were clarified and answers given, leading to new questions. This book presents the results after 4 years and compiles contributions from many of the participants, treating specific questions and showing the results achieved.

The remainder of the chapter introduces first the objectives. It then reviews in its major part the outcome of the action in three sections, which cover clarification of terminology, procedures of real property transactions and cost of these procedures. In a short section the participants in the action are listed and some details of how the work was carried out are included before it closes with a discussion of open questions for future work.

At the beginning of a research project one often has a certain question, a certain disciplinary focus and a certain methodology in mind. When doing research in an interdisciplinary field like 'cadastral studies' the researcher must be open to review the

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question and the methodology when some initial answers are found. For the Cost Action G9 the start document contained a rather detailed description of the legal-administrative aspects, as well as of the ontologies for geographic information processing; these were the aspects we understood as the result of previous research. In the course of the project we found it necessary to shift our focus to include the framework of New Institutional Economics to model transaction costs in real property, and we had to investigate the position of the real estate sector within National Statistics, two points only very summarily mentioned in the project document.

The project revealed more substantial differences in what goals different European countries pursue through the regulation of real property transactions. It becomes evident that a simple comparison of cost of comparable steps in the transaction across border is comparing 'apples with oranges' and reveals only half the truth. We hope this research has contributed to an improved understanding and inspires others to pursue some of the interesting questions we had to leave without answers.

2. The Objectives of the COST Action G9 'Modeling Real Property Transactions'

In 2001 the objectives were (as stated in the Technical Annex, which defines the Cost Action G9):

> "The main objective of the COST action is to improve the transparency of real property markets and to provide a stronger basis for the reduction of costs of real property transactions by preparing a set of models of real property transactions, which is correct, formalized, and complete according to stated criteria, and then assessing the economic efficiency of these transactions.
>
> The detailed information will be presented in such way as to include a formal description of the underlying data. For selected European countries a comparative analysis of the economic efficiency of transactions involved in the transfer of property rights will be presented, supplemented by an exploratory analysis of relations between transaction costs and national practices regarding land management, education, and governance.
>
> The models of real property transactions must satisfy the criteria of validity from an information modeling, ontological perspective, as well as from a legal perspective. The transactions regard inter-organizational business workflows, which are stating or changing property rights and parcel lots.
>
> The essential effects, intended and non-intended, of the real property transactions are likely to differ among the countries being investigated. The comparative analysis of the economic efficiency of transactions will include an identification of these effects and an assessment of their impact on the economic efficiency, including an assessment of the value of transaction information for further purposes.
>
> Statements will be made on the real property transactions, which affect land management, specifically regarding the transition of land use from rural to urban. The statements will identify threats to the transparency that is at stage during the transition process.
>
> The main benefit of the action is that governments, professions, and holders of property rights get a better basis for reducing the costs of the transactions of the markets of real estates.
>
> The developed models can be used for drafting new ordinances, and for education. The outcome of the comparative analysis can be used for improving the efficiency of the procedures. The provided description of various effects of property transactions can

serve as inspiration for other countries, also by addressing the issue of transparency of real property transactions."

3. Terminology

Clarification of terminology and strict definitions are crucial for all scientific research (Gottman et al. 2002). In a project investigating real estate, the first terminology is the terminology of the national law in the national language (or languages). The meaning of terms like real estate, ownership, mortgage, etc. is defined in the law (Navratil 2002; Navratil et al. 2003), with a semantic that is different in different national legal contexts. This makes comparison across countries difficult, because the same term may be used differently and often there is no exact correspondence between concepts. For example, a *registry of deeds* in the USA and a *Grundbuch* in Germany serves the same overall function, namely listing the owners of land, but the details are different such that a translation of 'Grundbuch' as 'registry of deeds' is acceptable only in the most superficial discussion.

The national laws select appropriate words from their language to describe legal concepts; these terms do not correspond even between countries that use the same language. For example, the term *Kataster* is used in Austria to indicate what in Germany is called *Liegenschaftsbuch*.

Fortunately, a conceptual agreement in European law exists; it is based on common roots, namely the Roman law as collected in Justinian's Digest. The cadastral law and its practical execution throughout the Habsburgian empire gives a common background to many Central and Eastern European Countries. Many national real property laws originated with the codification of civil law in the time of Napoleon and have evolved since (for example, France, Spain, and South America). Later on the Prussian development of civil and administrative law with influences beyond the German borders is important. Other countries, especially the Nordic countries, Russia but also Muslim countries have separate traditions. This makes it increasingly difficult to find corresponding concepts and to fix translation to a single common terminology necessary in a project like this.

The project used English as a working language and used in preference the legal terminology as defined in a well-known law dictionary (Black 1996), despite the potential danger of importing with the terminology also part of the conceptual background of a foreign legal system. As far as practical, terms used in a national law were always added to the translated terms, to remind readers of possibly different connotations and to preserve the detailed meaning for the connoscenti.

4. What Is "Real Property"? What Means Ownership?

The definition for "*real property*" found in the law dictionary is:

> Land and anything growing on, attached to, or erected on it, excluding anything that may be severed without injury to the land; real property can be either corporeal (soil and buildings) or incorporeal (easements).—Also termed realty; real estate. (entry Property, subentry Real Property (Black 1996))

This definition of a legal term points both to physical objects, and to non-physical objects, which exist only in a legal sense:

- The first part of the definition is a definition of physical land and buildings: the term real estate is prototypically used to describe land parcels, buildings with the land they are sitting on, but also flats in apartment buildings when they are separately owned, etc. It is noteworthy that the land parcel must be delimited with recognizable boundaries to form an object in the sense of the law. A land parcel is

a physical object in the tiered ontology ((Frank 2000), see chapter 4.6), which 'counts as real property in the context of the law' (Searle 1995).

- After the semicolon, the definition expands the applicability of the term real property to other—non-physical—objects related to land, primarily rights, like easements, securities for debt, etc.

Most national laws differentiate between movable and immovable goods and require special procedures for the transfer of ownerships and other rights in immovable objects (for example the Swiss Civil Code (Schönenberger 1976)). Not every object considered by a layperson as real estate is real property in legal terms and, of course, not everything in the terminology of the law described as real property is seen as real estate by the public; linguists speak of 'prototype effects (Rosch 1973): land parcels are prototypical, most laypersons can see how ownership of apartments is treated similarly, but it may surprise that many national laws treat aircraft and ship in the same way (Figure 1).

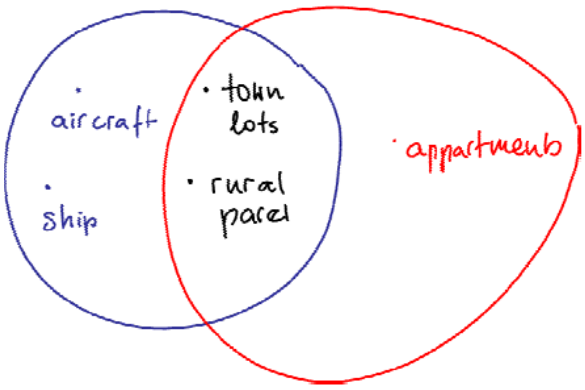

Figure 1: Examples for real property (Frank 2004)

Differences are substantial in what a national law admits as incorporeal real property. Typically, rights to secure credit (mortgages) and easement (for example a right-of-way) are construed legally as real property. For the purposes of this study, we admit as real property everything, which can, under national law, be registered as real property. Countries differ mostly what they exclude: property of apartments in buildings are often construed as real estate, but not always (e.g., Finland); sometimes the ownership of land is separated from the property of the building erected on it (e.g., Latvia, compare chapter 2.2), etc.

The other important concept for this study is ownership. The definition in the law dictionary is:

> "One who has the right to possess, use, and convey something; a proprietor" (entry owner (Black 1996)).

The concept of ownership seems to be both a factual term and a legal term. The law sometimes separates ownership from possession; possession describes then the direct factual control of a thing, e.g., a pencil, a book, or a car, or even a piece of land. A tenant has possession of the land, but not necessarily ownership. Possession includes the right to use, but not the right to convey the object to another owner.

5. Procedures

Real Property Transactions are the procedures that are necessary for owners to dispose legally of their ownership (or related real property rights) and a new owner to acquire them. National laws establish stringent, multi-step procedures that must be followed to achieve a legally valid transfer of ownership. These restrictions are first to protect the parties, but also to

further other public goals. Other parties, besides the seller and the buyer, may be involved: lawyers, notaries, real estate valuators, and geodetic surveyors. The details of the procedures vary depending whether town or rural land is conveyed.

In order to achieve comparable detailed descriptions, two important, often occurring cases, which occur in all European countries similarly, were selected:

- The acquisition of a single-family dwelling in a small town. This is an important transaction in many families' lives, often the most important one in a lifetime.
- The subdivision of a parcel with the intention to build a single family home.

A very large part of all real property transactions relates to sales and subdivisions, especially when transactions in apartments are included; a study of these two transaction types should reveal interesting insight in national procedures and give a valid base to compare transaction costs and how they influence the market.

The procedures for the transfer of ownership in these two cases were collected. Efforts were made to describe in detail a single realistic case and to avoid getting lost in differentiations that are particular for a single country. Details of the procedures are different in every country and the prescriptions are spread over different types of instructions. Only if a very concrete case is selected, all the details of a procedure are fixed, but seldom does a single person know all of them. Using the standardized cases and following the necessary procedures through all professional specialists involved resulted in draft descriptions. It was often found that comparison in discussion with specialists from other countries led to more precise descriptions that were then again refined to reflect the national particulars better.

Based on the experience with the two transaction types selected, we believed that other transaction types; like vesting of easements and land consolidation (see chapter 5.2); are likely to be more difficult to compare. These other types of transactions tend to be more complex, aim at a wider range of objectives, and are more influenced by national traditions than sales and subdivisions.

For most of the participating countries—Denmark, England and Wales, Finland, Greece, Hungary, the Netherlands, Slovenia, and Sweden—the transaction processes are described in some detail, and based on these different types, comparisons can be made. The descriptions could be refined, but benefits from more details were not evident. The goal of the action mentioned transparency in comparing transaction in order to do a comparison of transaction cost and mentioned also the need of education of real property specialist. Both goals can be satisfied with the current descriptions. The raw descriptions, with detail not made comparable, are available for new research.

The identification of similarities between countries appears more important than finding more details separating the procedures in different countries. Two influences resulting in similar procedures are:

- countries that have or do not have notaries,
- the organization of surveying of land:
  - countries with very simple subdivision (FIN, NL, UK), allowing sale of unsurveyed parts of properties;
  - countries with state surveyor;
  - countries with private surveyor (sub-groups of surveyors with authority or as technical expert).

6. Modeling

Achieving comparable descriptions where no common terminology and conceptualization is available, is a challenge. First, methods and tools to formalize conceptualizations and to construct procedural models were investigated. Such method had been used (Bittner 2001; Navratil 2002) to model cadastres in general and particular national procedures. The

Workshop 2001 in Bremen (Stuckenschmidt et al. 2004) revealed that the gap between the very formal approaches and the practical requirements of the project were too large. Instead of the recommended top-down approach, from general concepts to specialized procedures, an approach to work 'upwards' from the routinized behavior of the actors (parties and their advisors) was more practical.

The suggestion to use the Uniform Modeling Language (UML) was made initially (see (Šumrada 2002)). This specification language is often used for the analysis and design of information system. UML is widely known, has good learning materials and substantial supporting tools. Over the course of the action for most participating countries the real property transaction processes were depicted in the form of UML activity diagrams (see chapters 2.1 and 4.4).

In parallel, the development of a *core cadastral domain model* (CCDM) as a UML class diagram was undertaken under the guidance of Chrit Lemmen and Peter van Oosterom, within the framework of FIG ((van Oosterom et al. 2002a; van Oosterom et al. 2002b; van Oosterom et al. 2003; van Oosterom et al. 2006). Several partners of the COST G9 action got involved and a joint FIG and COST G9 workshop in Bamberg in December 2004 (van Oosterom et al. 2004a) resulted.

The UML diagramming technique connects the class oriented analysis with a procedural view. The cadastral domain can not do without the more data (set) oriented way of thinking, which the class diagrams represent, but neither without the process approach representing the constant flow of changes in man-land relations that calls for updating those data sets. The core cadastral domain model stresses more a static view and is complemented by the process oriented activity diagrams produced in the COST action. We believe that neither of those on their own will be expressive enough to be truly called a domain model (e.g., (Zevenbergen 2002; Stubkjaer 2003b). A domain model must list the most important aspects of the domain, being objects, actors, or procedures. A model of this kind is shown in chapter 4.1 (and in (Stubkjaer 2003a)).

The different types of diagrams in a domain model each focus on different aspect. The class diagram is useful for the design of a database and software, whereas the activity diagrams help to see which actors are involved and how they interact. Only the activity diagram revealed the differences in the real property transactions and allowed through comparison to identify some of the social goals justifying the differences.

7. What the Analysis of Real Property Transactions Revealed

The primary objective of a real property registry is to identify ownership and related rights to land. To achieve this common primary goal, the same data are needed and therefore class diagrams are quite similar for land registries in different countries. Comparing the activity diagrams however reveals differences as has been shown in the EULIS project (Tiainen 2004) and the action COST G9 (see chapters 2.1 and 4.4).

The comparison of the activity diagrams revealed differences and allowed to understand the goals the legislators and to identify the contribution a real property transaction makes to other processes in managing land. The comparison revealed an enormous variety and number of other goals the national legislators have linked with the registration procedures. There is primarily and nearly everywhere the goal of collecting a tax, but there is a diverse list of other goals (see (Frank 2004)).

Land Taxation

One of the original functions of a cadastre is the equitable taxation of land. Land registration is based on a detailed map produced by a land surveyor and therefore all land is necessarily included and taxed which contributes to the goal of equitable taxation. The base for taxation is

the assessed value, often computed from historical assessments. Slovenia plans do use modern mass appraisal methods to update their land values for taxation; this appears novel in Europe, but is standard practice in the USA. A land tax, which is to be paid regularly, is reflected in the class diagram as certain base data (size of parcel, assessed value, etc.) that are necessary to calculate the tax. It might affect transactions depending how authorities assure that the previous owner has paid his taxes before the transfer, but often the burden is passed to the buyer by granting a tax lien (mortgage) for unpaid taxes.

The goal of equitable land taxation requires that the size and value of a new formed parcel during the subdivision is fixed by an expert. In other countries, a certification that all taxes are paid is required. The seller must provide that certification before a transaction can be completed.

Land sales taxes

Legislators have also found that the time of a sale of land is a good opportunity for taxation: the seller most likely has cash in hand. Therefore, land transfer is typically based on the value of the contract and taxed separately from ownership.

This tax has several effects: First, the parties are induced to mention in the contract a lower price than what was actually paid. Second, parties are lured to have private (unregistered) contracts. Frank has found large numbers of unregistered land transfer contracts in some South American countries and a practice to use adverse possession as a method to register sales: the parties swear that the necessary period of undisturbed use has been completed. This form of registration of ownership based on undisturbed adverse possession is not taxed, whereas sales are taxed by different authorities and to get the necessary documentation that the taxes are paid is difficult.

Taxation of transfer has negative effects on the performance of the registry but also on the allocation of land; the difference between new use and current use must be larger to overcome the hurdle of the transaction cost, which include the tax, for the parties. Countries with land sales taxes typically require that the seller or buyer demonstrates that the tax is paid before a transaction can be completed.

Facilitate acquisition of land by others

When a parcel changes ownership it is a perfect time to allow others to preempt the contract and to acquire the property at the same price instead of the negotiated buyer. This, first, reduces tax cheating with underreporting of sales prices (because the preemptor will pay only the reported price) but is also used to advance other goals, e.g., protection of family farming is often furthered by a provision that neighbors can preempt a sale. Preemption for family members is also often encountered, but preemption rights may also be given to the town. See chapter 5.3.

Preemption rights, to be effective, must give the party, which can use the preemption right, a reasonable amount of time to learn about the contract and to make a decision. Preemption rights therefore typically add some notification of the intended sale to the parties that could preempt and grant a waiting period for them to decide. This time is added to the time necessary to complete the transfer and increases its cost by increasing the risk.

Preemption rights make land transaction more risky in general, because the parties are never certain that the transfer will occur as planned. The up-front cost of the buyer to investigate the parcel and to make a decision may be wasted.

Other goals

When a real property transaction is planned, numerous other public goals may need protection. Legislators tend to add safeguards to the transaction by requiring the interested

parties to produce a certification by some authority that the intended transaction does not negatively affect these public goals.

By certification we mean all procedures, which introduce other parties—mostly public agencies—that must make some positive statement that the procedure should go forward. To protect farm lands, Austria for example requires for a subdivision in agricultural land certification from the ministry of agriculture that the new parcel maintains form and access necessary for productive agriculture. In some Scandinavian countries, a certification of conformance with the planned land use must be issued by the commune. Another type of certification is used in Austria to protect certain classes of sellers to make it more difficult for them to sell their property (e.g., the church).

Certification is always costly and increases the length of the procedure. The cost can be direct when the parties must acquire the certification themselves from a public agency or an authorized agent. The cost can be born by the public, when certification is obtained by the registry as part of its internal procedure; this cost is then sometimes passed on to the client as part of the fee.

We can see these different procedures, which are linked to the registration of ownership as *social burdens*, which are linked to the transfer of ownership. They have the same effect as taxes: they make land transactions more costly. It is tempting for the legislator to burden the transfer of ownership in real estate with various other social goals. It seems difficult to achieve an assessment of the benefits and compare them with the cost: they arise to different masters, at different times. It is a political decision, whether the cost outweighs the advantages. Skeptics may think that the cost is real, but the benefits are not, or not as big as imagined by the politicians.

8. Transaction Costs

Classical economic theory assumes that transactions have no cost. However, everyday experience tells us that transactions are costly. Everybody has experienced the effort necessary to buy, for example, a new car. One has to obtain information about the cars offered and then to select one, negotiate a price, etc. Similarly, there is an effort by the seller to advertise, to contact prospective buyers, etc. The transaction costs are most vividly experienced, when buying a new car and then trying to sell the exact same car a minute later: the price one obtains is much lower than what one paid—this is the cost of the transaction!

Douglass North has introduced transaction cost in economics. He received the Nobel prize in 1993 for the foundation of *New Institution Economics* (North 1997). The theory of transaction cost is a precondition to understand how companies work and how the competitiveness of a country in the international market is influenced substantially by the transaction costs. Hence, the need to analyze and compare the transaction cost across Europe.

The terms 'transaction' and 'transaction costs' are technical terms within *New Institutional Economics*. The cost of a good to buy is not only the price paid but includes the efforts of searching for the best offer, assessing the quality of the product, protecting the property rights during the transaction with institutionalized paper trails and enforcement measures. Similarly the value of a good to a seller is the price he receives minus his effort for selling. Detailed description of the different steps a buyer and seller must undertake together with assessment of their cost can be found in chapters xxxxx.

North splits transaction costs very generally into enforcement and measurement cost. In a recent article Quigley (REF? xxxxx) differentiates six different types of costs, which can be applied to, specific for real property transactions:

- Search Cost: the cost to obtain information about available properties and to identify the one to acquire.

- Legal cost: the cost for assistance with the legal aspects of the acquisition; assessing the legal status of the property offered and guidance with the process.
- Administrative cost: cost of administrative procedures.
- Adjustment cost: cost of adapting the current situation to the new situation.
- Financial cost: the cost of the capital required during the transaction; typically, payment for the new property is expected before the previously owned property is sold.
- Uncertainty cost: the cost associated with the risk involved in the transaction.

Our study concentrates on legal and administrative cost but includes some of the other costs. We found that risk is a substantial factor in some countries, especially in the transition countries.

Transaction costs are not only important per se but influence the market and therewith the optimality of allocation of resources. Higher transaction costs result in a smaller market volume: the difference between the value of the utility of the real estate to the current owner and the higher value to a prospective new owner must be higher to overcome the higher cost incurred in the transaction. Allocation of resources is not optimal compared with the allocation when transaction costs are zero and all land is allocated optimally. This is a loss for the economy as a whole.

This viewpoint is not exclusively in monetary terms and includes external cost, primarily social costs. Low transaction cost for real estate may result in very frequent changes in the environment, which may create external costs. If new constructions replacing old ones at a rapid pace, faster than what society can adapt too easily, we face social cost for adaptation, usually “paid” by the elder generation or the children. Transaction rates affect also the speed with which social groups mix or separate: Portugali has shown in simulations that slow transfer—in his case of changing the family apartments, either by lease or ownership—affects the mixing or separation of different racial groups in a city (Benenson et al. 1995) and may thus contribute to racial tension in a city.

The influence of transaction costs on the performance on real property markets considers the cost as seen by the buyer and seller. The costs include the fees and duties to public services, as well as the charges and honoraries to counsel and consultants. The fees, etc. seem to be fairly easy to record. The costs of honoraries are more varied and therefore more difficult to establish, because of the different complexity and hence costs of cases. The cost of the parties’ own efforts may be accounted for in verbal form, including references to search facilities available and their charges. Selecting typical cases, the costs can be assesses for each country and converted to a common currency (e.g., Euro) and compared, for example Viitanen (2004) for Finland, and Lisec (2004) and Mikkonen (2004) for Finland and Slovenia (see also chapter 3.x). The World Bank reported on the processes and costs of registering property using a comparable methodology (WorldBank 2005), but differences in the example cases used do not allow direct comparison.

If our interest is to understand which procedures are more effective from a national, not an individual, position, then this assessment of costs to the parties is incorrect: it overestimates the cost of real property transaction to the national economy by including taxes into the cost, and it underestimates the real property transaction cost by not including the cost of running the real property registration system. The provision of governmental services, like land registries, land survey, courts and also the formation and organization of the related professional services are at substantial cost borne by the public and often only imperfectly passed on to the users as fees for services rendered.

Governmental services in form of cadastre and land registration, make manageable units of real estate from unstructured space and other natural resources. Such units are not physically existing by themselves and do not form legal units automatically, but only through

an institutionalized process they become units with legal status. Land registration, including boundary creation, is a process of capital formation as described by De Soto (2003) (Zaibert et al. 2004)). Government charges for such services are difficult to separate in what are fees for services rendered and what amounts to a tax; occasionally the fees are so low that effectively the public subsidizes the formation and registration of land parcels.

Methods that were developed for the standardized System of National Accounts, especially the so-called 'Satellite Accounts', must be applied to render a comprehensive picture. One would have to define the field of interest, namely the segment of society concerned with changes of rights in real property, which is difficult to separate from the construction sector. The description of the activities with relation to the standard classification NACE ('Nomenclature statistique des Activites economiques dans la Communaute Europeenne', i.e., Statistical classification of economic activities in the European Community) is necessary to collect the data in a framework comparable to other fields. In chapter 3.x this approach is further developed.

Public bodies are not reflected in any detail in the industrial classification of NACE, which made us follow a different route to assess the public cost of real property transactions. The yearly reports of the agencies involved in each country show—with varying levels of detail—the cost of running these agencies and the number of transactions they were handling. From these indications rough estimates for average cost of transaction for the national agencies can be computed.

The three different assessments of the cost of real property transactions include different scopes:

- the viewpoint of the parties (buyer and seller) includes taxes as a cost; it is relevant for the functioning of the market,
- the agency viewpoint helps to identify whether transactions are subsidized or taxed, and
- the viewpoint of national accounting shows overall benefits and costs, and thus an overall efficiency of real property transactions.

General policy issues like cost recovery for public services and more generally the commercialization of public sector information are typically focusing on the ‘agency viewpoint’ and may lead to decisions, which are from a national viewpoint shortsighted (Martinez-Asenjo et al. 2002). Currently data to guide such decisions are scant, but in recent years national statistical services, authorities encouraging competitions and markets, and the European Commission have in the context of the Lisbon Strategy paid increased attention to the delivery of professional services, c.f. COM (2005)).

Despite the limitations in measuring and comparing transaction costs, a few countries—Denmark, Finland, and Slovenia—have quantitatively estimated the transaction costs in a comparable way. Two approaches were followed: The first one relates to the transaction costs for the users (‘clients’) of the system (see chapter 3.1), whereas the second one relates to the money involved within the system as part of the national economy (see chapter 3.2 and (Gysting 2005; Lavrac 2005; Stubkjaer 2005).

9. Performance of the COST G9 Action

The action was initiated by a small group of university researchers with research interests in cadastre, geoinformation, and surveying. The COST action made it possible to establish an organized cooperation between 2001 and 2005 and to involve researchers from different backgrounds: mostly surveyors, but also information specialists, lawyers, and economists.

They come from the following 10 university departments which focus on land surveying and related aspects that are formally related to the project:

- Department of Development and Planning, Aalborg University

- Department of Geodesy, Delft University of Technology[2]
- Department of Building and Surveying, Napier University, Edinburgh[3]
- Institute of Real Estate Studies, Dept. of Surveying, Helsinki University of Technology
- Geodetic Department, University of Ljubljana, Slovenia
- Land Reform Research Unit, School of Surveying, University of East London
- Professor group of Geodesy and Cartography, Riga Technical University, Latvia.
- Division of Real Estate Planning and Land Law, Royal Institute of Technology, Stockholm
- Department of Geoinformatics, College of Surveying and Land Management, The University of West Hungary, Székesfehérvár
- Department of Rural and Surveying Engineering, Aristotle University of Thessaloniki, (joined in 2003 ???)
- Department of Geoinformation, Technical University of Vienna

The following 4 university departments provided the information and economic inputs into the project:

- Centre for Computing Technologies, University of Bremen[4]
- Department of Computer Science, Aalborg University[3]
- Department of Industrial Economics and Strategy, Copenhagen Business School[3]
- Department of Business Administration, Universidad Carlos III de Madrid[3]

Officially the project was divided into three working groups

- WG 1: Law and Models,
- WG 2: Cadastral Science,
- WG 3: Economy,

but the connection between the topics were so intricate that most people involved did not limit themselves to one working group only and meetings covered usually more than one WG. The dependencies of one WG on progress made in the other was further reducing the differences between the working groups. For example, at least preliminary results of WG's 1 and 2 are needed for WG 3 to be able to start their work. Important results came from the co-operation between WG's 1 and 2, especially the description of procedures in the form of different types of models (see chapter 2.1).

The two working groups 1 and 2 also connected to other groups working on a similar subject and organized together with Commission 7 of the FIG (International Federation of Surveyors) a conference 'Standardization in the Cadastral Domain' in Bamberg in the fall of 2004 (see (van Oosterom et al. 2004a) (see f.i. Vitikainen (chapter 3.1)). This conference was attended by 59 researchers from 14 countries and the results are produced as a conference proceeding (van Oosterom et al. 2004b).

In total eight general meetings were held, usually at about half year intervals. They were always followed by the meeting of the Management Committee of the Action (containing one or two representatives from each participating country). The meetings were held in Bremen (D), Vienna-Schewat (A), Delft (NL), Sopron (H), Helsinki (FIN), Riga (LV), Thessaloniki (GR), and Stockholm (SE). In the last two years of the Action WG 2 held two meetings (in Székesfehérvár (H) and Aalborg (DK)), and WG 3 two in Ljubljana (SLO) and Grange-on-Sands (UK)). With the exception of Spain (where a planned meeting had to be cancelled) we met at least once in all participating countries.

[2] Now OTB Research Institute, Delft University of Technology.
[3] Partner that –due to various reasons– did not participate actively after the early start.
[4] Later replaced by the Faculty of Economic and Applied Informatics, Otto-Friederich Universität Bamberg.

During the action most presentations and discussions took place in plenary meetings, although different sessions could be attributed to one of the working groups. In addition to the participants from the network other people from the host country attended the meetings. This included other universities' researchers, as well as representatives from organizations involved in real property transactions (especially cadastral and survey agencies or land developers) in that country. At some of the meetings we also invited lectures from disciplines were we needed additional input from, e.g., Knowledge Engineering, Institutional Economics, Statistics. In hindsight, one can see that these contributions influenced the course of the action substantially.

'Short Term Scientific Missions' (STSM's) were very important to achieve the comparisons across national boundaries. These STSM's allow (mostly junior) staff members of participating institutes to travel to another participating institute to take advantage of the research facilities available there. In total 15 of such missions were undertaken, especially by PhD-students. Some of their results can be seen in Hess and Vaskovich (chapter 4.4) and Vitikainen (chapter 3.1).

The results of the action has been promoted beyond the group involved: Papers giving a broad overview of the Action's objectives and intermediate results have been presented at other scientific and professional meetings (Stubkjaer 2002; Zevenbergen 2002; Stubkjaer 2003b; Frank 2004). More information can also be found on the COST G9 homepage: http://costg9.plan.auc.dk/

10. Conclusion and Further Work

As this COST action comes to a close it is useful to review what was achieved, and what can be learned from the COST action both methodologically and substantially for the organization of real estate registration in general. We have achieved the following results:

- A method to describe and compare the procedures used in different countries has been developed. With this schema the procedure in another, new country can be quickly captured and compared with the countries we have analyzed.
- The procedures for registration of real state transaction have been systematically described for several countries. These descriptions allow analysis and comparisons.
- Cost of transactions can be deduced from their descriptions; it is also possible to assess the time necessary for a transaction and compare the differences in registration procedure quantitatively across different countries.

This project was teaching us some important lessons, which are worth reviewing:

- Good science starts with clear terminology (Gottman et al. 2002). Scientific investigation in a field where terminology is confused or not comparable across national boundaries is extremely difficult. Social science is often faced with this problem and this project was not an exception. A major result of the project is the method found to compare non-comparable terminology by identifying physical objects, which are the same across cultural boundaries (or close) and basic social processes (use, full economic control, inheritance, security, etc.), which again are comparable across nation boundaries. We found—the hard way, denying initially the need—that we had to agree on terminology and construct the corresponding ontology.
- Comparison shows that comparable parts of the system of ownership registration and transfer of real estate ownership are similar across national boundaries and the differences in efficiency and cost are bound to disappear—if taxes and other social burdens are excluded and the focus is on registration only. Countries in transition have difficulties with renewing and rebuilding their land registries, educate the

necessary personnel, and cope with the large number of updates in conjunction with the transition from socialist to market economies at the same time results in backlogs; this seems mostly a transitory situation that is overcome soon.

- Legislators are tempted to burden the process of registration of an ownership transfer with various other socially desirable restrictions. Taxes associated with the transfer of ownership are nearly universal but various other goals are furthered by restrictions on the transfer of ownership. They invariably increase the cost of the transaction financially and by slowing down the transfer. These differences cannot be part of a simple comparison because the benefits the legislator expects from such burdens vary enormously and are hard to quantify; they are as political goals not directly related to securing ownership of real estate. The project has contributed in identifying such burdens and provides information to the legislator who can then decide if the cost is worth the expected benefits.

A good scientific project does not only answer some questions but poses also new ones and refines some old ones. The analysis of the functional objectives that real property transactions should fulfill should be extended beyond the simple sale and we found that subdivision transactions could be a next interesting target. Four functional objectives that can be seen in most of the participating countries with regard to subdivision are: (1) reorganize the rights in the plot and its surroundings according to the wish of the parties, (2) without compromising the rights of passive (and active) holders of rights, (3) in compliance with spatial, environmental and agricultural legislation, etc., and (4) maintaining the clarity and efficiency of registration, by, i.a., establishing systematically identified plots of land (cf. (Stubkjaer 2002).

Although these four objectives can be seen in many of the countries, the order in which they are taken into account, and the actor dealing with them, clearly differs. Another group of countries, however, does not include all of these four objectives. Research should produce a methodology to connect the stated or tacitly followed procedures with unstated objectives to identify, first, which objectives in each country are included with subdivision procedures and second, identifying the rational for such decisions is then a next step.

With a fairly rich array of descriptions and models of real property transactions available, it is about time to once more look for formalized terminology and ontology. It is suggested to use the nouns from the activity descriptions as potential candidates for classes in an extended type of ‘class diagram’ and then further formalize the activity descriptions (Stubkjaer 2004)).

This project has advanced cadastral science as a field of geoinformation science and surveying. Last but not least, one may ask how it influences our perception what cadastral science is and could be. These questions should be discussed in the new scientific journal on the topic of surveying and real estate research, which emerged during the life of this project and was influenced by some of the leaders in this action.

We conclude the action with the uncertainty how much comparison and unification could and should be achieved. The investigation started with an almost simple goal—compare cost of real property transactions across European countries, assuming that the terms used ‘real property transaction’ and ‘transaction cost’ were well defined for all the countries involved. The research revealed an increasing host of differences in terminology, concepts, goals, and observation methods; we found methods to give answers to the “simple question” posed initially, but the answers must be qualified and we cannot award a gold medal for winning the “least transaction cost competition” to a country: the results are not comparable. It appears as that differences are justified and a drive to standardize to one solution not justified and fortunately also not politically feasible.

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