Danish Mortgage Finance, Property Rights Protection and Economic Development

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# TABLE OF CONTENTS

1. Introducing the Research Domain; ............................................................................................................................... 2  
   1.1 Research Project Definition .................................................................................................................................. 2  
   1.2 Research Domain ................................................................................................................................................. 2  

2. Identification of Research Problems and Objectives; ..................................................................................................... 4  
   2.1 Theoretical Challenges vs. Operational Solutions ................................................................................................ 4  
   2.2 Choices of Methodologies and Theories ............................................................................................................... 6  

3. Presentation of the Methodologies Used for Addressing the Problems; ........................................................................ 8  
   3.1 Overview of Research Methods Applied ............................................................................................................... 8  

4. Presentation of the Theoretical and/or Empirical Investigations and Findings; ............................................................. 10  
   4.1 Inventory and Findings on Danish Mortgage Finance ........................................................................................ 10  
   4.2 Overview of Findings on Collateral Security in Danish Mortgage Finance ......................................................... 11  
   4.3 Development of Propositions on Prerequisites for Danish Mortgage Finance ................................................... 13  
   4.4 Global Information Sources on Cadaster, Land Registration and Property Rights Protection ........................... 15  
   4.5 Macro-economic Indices and the issue of property rights’ protection ................................................................. 16  
   4.6 Screening Methodology ..................................................................................................................................... 17  

5. Concluding Answers to the Research Questions and Discussion of Findings ................................................................. 18  
   5.1 Results regarding specific research questions (VP Securities A/S) ..................................................................... 18  
   5.2 General Findings and Contributions to new Knowledge .................................................................................... 19  

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1 The paper uses the same references as the PhD Dissertation, Appendix 10. One reference has been added:  
Cagdas, Volkan; Stubkjaer, Erik; 2009; ‘Doctoral research on cadastral development’, Land Use Policy, Volume 26,  
Issue 4, October 2009, Pages 869-889, ISSN 0264-8377
1. Introducing the Research Domain;

1.1 Research Project Definition
This research project was developed in cooperation between Aalborg University and VP Securities A/S, who are working on transplanting the Danish Mortgage Finance system in cooperation with its partner, Soros Fund Management, through a global consortium (‘Absalon’, http://absalonproject.com). The given research problem is screening of readiness and potential for market development in global markets, with a special focus on conditions of cadasters, land registration for mortgage pledging.

The VP Securities’ requirements to the PhD project were specified to be comprising four large issues of assessing readiness, market potential, and adequacy of infrastructure in a given country for transplanting the Danish Mortgage Finance system:

“1. Assessing a country’s readiness for introduction of mortgage credit based on macro-economic and political stability;
2. Classification of countries for the potential of export of VP-securities mortgage solutions;
3. Screening of the adequacy of the infrastructure in a given country in respect to cadastre, real property registration and other functions of importance for securing collateral and for valuation of properties;
4. Analysis of the legal system and regulations, which could form hindrances for introduction of the mortgage credit system.” (PhD Agreement, Appendix 2A, 2007)

The research agenda may appear as a pure design process proceeding from specifications of assessment criteria to design of screening methodology. However, development of an assessment framework with criteria and indicators depends on an underlying theoretical framework (OECD, 2008), thus on concepts, representation and measurement, as well as on determining the prerequisites for mortgage finance. Therefore, the project touches on general issues of understanding both the concepts of mortgage credit and property rights, and on their dynamic relations in economic development.

The research task requires both a global classification and assessment framework, and an approach to analysis of the particularities encountered in a specific country. Furthermore, operationalization is an implicit requirement, and development of a functioning screening method is dependent on availability of appropriate information suited for use in screening.

The definition of criteria for mortgage finance development is closely linked to core research questions in the land professions, such as what are the causal relations between formal land registration regimes and real credit, and what are appropriate property rights regimes for economic development. Therefore the underlying research questions lead to issues of reform policies and development strategies. For these reasons there are parallel levels of research questions: The specific questions related to the challenge of screening readiness for Danish Mortgage Finance as set out by the four research tasks, and the underlying general - and grand – layers of questions on what type of property rights regimes are conducive to economic development.

1.2 Research Domain
Three key concepts define the multi-disciplinary research domain and offer guidance to research direction through their definitions and historic roots.

A. (Danish) Mortgage credit
A mortgage pledge is by definition a pledge in a property right, which implicitly limits the domain to a formal property rights regime. From the definition follows an identification of ‘collateral’ as a central concept. A selected delimitation of the topic was the focus on mortgage finance for urban housing. The Danish mortgage finance system is a market based financing system, that presupposes a functioning property market and a property rights infrastructure (land registration, etc.). It follows that property rights and associated infrastructure services are to be seen from a market perspective.

B. Property rights
Definitions of ‘property rights’ underline the importance of enforcement of rights by the State (Haldrup, 2008). Mortgage pledging in a formal property rights regime depends on functioning systems at a more general level beyond the act of registering rights and transactions. Property rights protection is therefore seen as embracing other issues than cadaster and land registration, by including dynamic dimensions of functioning real estate markets.

C. Economic development

Economic development serves as an overarching concept, which may implicitly be seen as an overall goal of mortgage market development, but to what degree economic development is seen as a precondition for or as an outcome of mortgage finance development is one of the issues analyzed, just as it is discussed what is the role of real credit and property rights protection in development. The understanding of economic development in this project builds on the multi-dimensional model built by World Economic Forum (ref.).

A further dimension derived from the definitions, namely the importance of the ‘time’ factor, which is inherent in the nature of long term credit and of economic development. The centrality of ‘time’ provides methodological guidance, because it shows the research domain as related to history, and underlines the analytical relevance of timelines and development paths.

The research domain can be illustrated by a triangle, formed by the (potential) relations between the topical research areas, with the basis formed by mortgage credit and pledging of property rights. The issue of security of ‘collateral’ is a key issue in development of Danish Mortgage finance, as well as in the discourse on land registration. Collateral is therefore seen as a central issue in the study.

The triangle is illustrating different analytical perspectives of analysis as seen from each vertex, and is suggesting relations – if not causality - between each of the topical areas to be explored, analyzed and discussed in support of the given research tasks. However, the topics are so closely intertwined, that discussion of one issue inevitably leads to the other. That the three topic areas are closely interlinked in economic life was demonstrated with awesome clarity by the events of the global financial crisis that escalated during 2007-2008. For this reason, the events of the crisis were relevant to the study.

I have analyzed the project domain with the central phenomena of ‘collateral’ by using various empirical and theoretical insights from three different perspectives, as reflected in the structure of the thesis representing each of the analytical perspectives (A, B, C). The discussion on economic development in Part C is focused on topical theories concerning property rights and credit, but theoretical questions are raised and discussed in other parts, as well.

To sum up, the research domain is characterized as multidisciplinary and formed by the topical areas of mortgage credit, formal property regimes, and economic development within the paradigm of a market economy. The domain spans different abstraction levels from the operational field of cadastre and land
registration to theories of economic development, and is characterized by different research traditions associated with each topic area.

Delimitation?
The research domain was mapped out in the form of a question matrix, linking the various components of the four research tasks logically together within the three topic areas of A, B and C, as a guiding red thread through a vast domain. Although clearly desirable, narrowing the project down and defining a more limited scope was inhibited by the research questions depending on a holistic and global perspective. However, the breadth of the research project has come at a cost.

Coverage: The selection of research questions is representing points in a huge area, but do not cover the research field defined by the three themes. Some issues are covered better than others, and the depth of analysis is inhomogeneous, with highest emphasis laid on two fundamental blocks of research:
- Analysis of the Danish Mortgage Finance system from different perspectives (financing model, development path, legislation) in order to identify what are the criteria for functioning of the system;
- Analysis of potential information sources for screening, in particular international monitoring systems regarding indicators and ratings of property rights protection.
These two blocks represent by volume the dominant part of the research project, but within each of the two blocks, there are spin offs in the form of deeper analysis of issues having a potential of generalization, and discussion of findings with wider perspectives.

Complexity: Many research questions are treated in parallel and at different abstraction levels. As an example, while analyzing the development of the Danish Mortgage Finance (DMF) system for identification of criteria, wider research questions on the dependency on the property rights regime and the role of DMF in economic development are also analyzed and discussed. Disentangling factors of a complex, dynamic system is a challenge.

Mixed theoretical basis: The three topic areas have different research traditions: Finance and economics hold strong traditions of conducting quantitative research, which is not the case in the land professions (except in technical areas). Research in cadaster and land registration is dominated by qualitative research methods and emphasis of empirical research rather than theory building in accordance with the scope of application orientation professional field as described by (Cagdas, Stubkjær, 2009). On the other side, economic development theories related to property rights and institutions belong to the higher theoretical spheres, as illustrated by their representation among Nobel laureates.

In consequence the research domain called for application of different theories in the analysis of the research issues, just as mixed research methodologies have been applied, as further discussed below.

2. Identification of Research Problems and Objectives;

2.1 Theoretical Challenges vs. Operational Solutions
Questions on readiness for introduction of the Danish mortgage finance (DMF) system concerns both specific issues directly related to the operation of the system, and to the market and broader contextual issues. Prerequisites for the functioning of the Danish Mortgage finance system were not found to be explicitly defined, although the DMF system is well described, as the rich literature on the topic shows. A distinction of what belongs to the financing model per se, and what are peculiarities in a Danish context is required, when analyzing prerequisites for its transplantation to other countries.

The research problem in brief is ‘Assessing readiness in other countries for Danish Mortgage Finance with a focus on property rights protection’. Responding to the research challenge depends on conceptualization, representation and measurement, as illustrated in fig. 2.
Danish Mortgage Finance, Property Rights Protection and Economic Development

INTRODUCTION TO PhD DISSERTATION, by Karin Haldrup, Aalborg University, February 2011, 10-02-2011 09:54

Figure 2. Research Problem of Assessing Readiness for Danish Mortgage Finance Development in other countries

It is required to discern what factors are critical for the functioning of the Danish Mortgage Finance system and what factors belong to a special setting. Therefore studying the DMF is at the same time an exploration of the interaction between system and context over time, and its role in economic development in Denmark.

The research problem and questions were initially structured into a research question matrix, which illustrated the relation between issues and dimensions, in a format that carried a potential for building a semiotic system (with reference to C. S. Peirce), but that direction of research methodology was not pursued in the thesis, although the research domain is triadic, see figure 1.

Theoretical issues arise in relation to understanding the links between mortgage finance, property rights and economic development. Major challenges were encountered, since conceptual models with measurement of quality of ‘protection of property rights’ and ‘collateral security’ were not readily available, but they are needed for scientific stringency in assessment of readiness.

Shortcomings in standard cross-national monitoring systems and lack of data added to the limitations at the operational level. In the paper presented and published in 2008 (Haldrup, 2008) it was argued that monitoring systems depend on more stringent definitions than currently available and on capturing of the nature of property rights as spatial phenomena. These shortcomings could not be overcome within the present project, since modeling is a major enterprise of its own.

For these reasons the project was seen as a research challenge at different levels:
- The specific research objectives as defined by VP with development of screening method, and
- The underlying general theoretical questions associated with different topic areas.
The specific level is addressed through each of the thematic components of the research: Part A on mortgage credit and Part B on Property rights, while the theoretical issues are predominantly discussed in Part C.

The logic role of each component of the study is sketched in fig. 3 with emphasis on the prerequisites related to property rights protection, including security of collateral. The flow from inventory to drafting of screening methods, to discussion of implications of findings is illustrated by the arrows from the upper left to the lower right. The analysis of real credit and the readiness in respect to property rights protection opened for a wider discussion on the dynamics of economic development with particular emphasis on reform strategies in the land sector in Part C.

The mode of reasoning differs among the components of the study. The Explorative components comprising inventories of the Danish Mortgage finance system and of relevant monitoring systems are dominated by deductive reasoning. The descriptive elements of the case studies are also largely deductive in nature. Other parts of the thesis rely on combined modes of reasoning, as discussed briefly in connection with the summery of findings below.
2.2 Choices of Methodologies and Theories

It was strived at distinguishing between
- Research methodologies, which are concerned with how to address the research questions, choice of research process, ways of reasoning and modalities of creating meaning; and
- Topical theories, theorizing on the basic concepts and their relations, such as represented by e.g., New Institutional Economics (North, 1990, 2005); and
- Methodologies as an output of a design process – in this case on screening of readiness for mortgage finance development.

Since the outcome of the inventories of e.g., relevant monitoring systems is relevant for the direction of the research, it can be seen that research methodology had to be developed in an interactive process in response to findings through an explorative process of both theories and information sources. If a complete monitoring system populated with relevant data had been available, then it is possible that assessment of readiness could have been addressed without developing a cumbersome screening process, so that emphasis in the study could have been laid elsewhere.

For this reason, the research questions were approached through an open research methodology taking its point of departure in exploration of the topical issues, and hereby leading to discovery of ideas and patterns of meaning, which in turn formed the foundation for fundamental choices of methodology and theories.

This is a research method propagated by Richard T. Ely (1884) and further elaborated by (McMaster, Watkins, 2006), as described in Part IO. Indeed, the contributions of Ely was discovered through an exploratory process. I suggest that Ely (1854–1943) is relevant in the field of urban studies, since he both contributed to research methodology and to the scientific field of land economy, which he founded in the US.
Ely advocated explorative forms of research in urban economics, and stressed the importance of history and institutions in spatial economic processes (McMaster, Watkins, 2006, p. 917), much akin to New Institutional Economics. A central point is a rejection of the theory-data dual, because, “Data are not ‘given’, but ‘taken’” (McMaster, Watkins, 2006, p. 905), and they are taken with a basic idea in mind, so there is no independence of hypothesis, assumptions and ‘ceteris paribus’ clauses, but data may be employed to narrow down the range of possible detailed relations between variables (McMaster, Watkins, 2006, p. 904). In this way the methodology allows developing propositions (e.g., on prerequisites for mortgage finance development) supported by evidence, but findings are not seen as conclusive, rather a link in a continuing process of theorizing and testing.

For these reasons an alternative style of reasoning is applied in the present thesis by exploring the key questions without use of a hypothesis: The given point of departure is that ‘collateral security’ is mandatory for (Danish) mortgage finance development, but the question is what factors are required for ensuring collateral security.

The logic reasoning proceeds from evidence to explanation by inference between background theories, data and observations. Therefore the inventory components of the thesis are just as theoretically important as the theoretical discussions. The type of background theories (topical theories) applied in the study included New Institutional Economics, and Collateral theories of Property Economics.

The topical theories also shaped the research methodology applied for analysis of research questions through the application of the concepts of:

**Development path:**
The history of DMF was mapped out along a time line to study the inference between factors of development with reference to North (1993, 2005), and

**Institutions:**
Mortgage credit associations were regarded as institutions in a broad meaning including features of social capital and trust. The notion of institutional uncertainty and institutional change were applied in explaining development of interest rates and affordability of housing.

In addition the domain of mortgage finance and property rights protection has been analysed as a dynamic system, by studying the inference of ‘structures’, ‘mechanisms’ and ‘events’, similar to the analytical model of urban mobility developed by Næss and Jensen (2002). A mesh appeared from the description and analysis of the Danish Mortgage Finance system by seeing it as a dynamic system determined by structure, mechanisms, events, and behavior of agents (borrowers, investors, and mortgage intermediaries). In particular the following concepts were found to be powerful in analysing and explaining mortgage credit system performance and markets:

**Structure:** Organisational structures, and incentive structures;
**Mechanisms:** Commitment mechanism, market mechanisms;
**Events:** Crisis, which are potentially productive windows in development of mortgage finance systems, by drawing attention to the weaknesses of the system and resulted in regulatory adjustments. Legal changes were shown to constitute ‘events’ that impacted forcefully on market behaviour in mature legal systems.

In this way the project applied well established theory in its search for deeper understanding of the dynamics below the surface of static system definitions in order to contribute to a better understanding of the underlying forces and drivers of economic development.
3. Presentation of the methodologies used for addressing the problems;

3.1 Overview of Research Methods Applied
Each of the three topic areas has its distinct character, and responding to different research questions calls for use of different methodologies. Due to the shortage of previous studies covering the research questions, a relatively large part of the study concerned collating findings and establishing an overview of selected aspects of the research areas.

The findings of the inventories, both as concerns the Danish Mortgage finance system and the availability of information on property rights protection, were determining for the later parts of the study. The methodologies applied for the study comprises a mix of literature studies, case studies, data analysis, etc.: 

1. Literature study, analysis and discussion
The depth of the literature study depended on the topic area, with coverage varying from comprehensive to selected literature only.

Literature study on Danish Mortgage Finance (A): A comprehensive literature search was conducted on Danish Mortgage Finance with the purpose of deriving key characteristics of the mortgage finance system. The review in A strived at collating findings and observations covering a period of over 200 years’ long of history, so as to study the inference between real credit, property rights and the market development.

The study benefitted from a wealth of primarily Danish language source material, supported by selected statistics. An overview of the development path was based on of a large amount of primary and secondary sources, including e.g., insightful observations from prominent insiders of Danish Mortgage Finance from different eventful periods in history, typically previous directors (Hein, Salløv, Callø) of mortgage credit associations, or current (Engberg Jensen, Director of Nykredit, President of Realkreditraadet, President of the European Mortgage Federation).

The review and analysis was primarily qualitative but supported by quantitative data. Interpretations of the sources were discussed and suggestions made on the inference between factors of the real property market, mortgage credit and the wider context.

It is suggested that the resulting overview and findings of the Danish Mortgage Finance system can be regarded as an independent research result.

Literature study re. Property Rights Protection (B.): The literature study on monitoring systems focused on major monitoring systems developed by international institutions and associations. In addition comparative studies on other related issues were included, for example on transaction costs, foreclosure and debt enforcement. The findings of the literature study formed a picture of the state of the art in the field of monitoring systems in land administration, etc.

While the review of literature had a qualitative nature, the review was aimed at locating quantitative data for use in comparative methods of analysis. The amount of quantitative data available on the status of cadastre, land registration and land governance was found to be fractional at best. Shortcomings were found in applied definitions and taxonomy of land registration systems. The result of the literature study was determining for the design of screening methodology.

It is suggested that the resulting review of monitoring efforts in the land sector can be regarded an independent research result.

Literature study re. Economic Development (C.): Part C is dedicated to analysis of theories represented by selected literature on economic development concerning the inference between credit, property rights and economic development. The literature reviewed and discussed represents high profile contributions to the ongoing debates on land, credit and economic development with implications for development strategies in the land sector, including a discussion of aspects of the financial crisis.
The review, analysis and discussion was focused on contributing to the understanding of what is the meaning and role of ‘collateral’ and ‘security of collateral’, both in mortgage finance and in economic development. In consequence, part C is dominated by qualitative research methods involving the full range of deductive, inductive and abductive reasoning.

2. Case studies
The use of case study methodology was part of the original project design, and two case studies were conducted in support of VP feasibility studies. As the project developed, there were added different levels of case analysis:

1. An in-depth study of the case of mortgage finance in Denmark and its (long) historic development path, including an analysis of context;
2. Analysis of the case of Nicaragua, including desk-review and an in-country feasibility study as part of VP Securities mission;
3. A desk review and feasibility study of the case of Ghana in support of VP Securities B2B project in Ghana;
4. Analysis of Macro-economic Indicators covering a short list of 20 countries incl. Denmark, Nicaragua and Ghana (each with data from comparative countries).
5. Analysis and classification of the long list of countries of the world as represented by selected, global monitoring systems and data.

Different types of inquiries were applied to each of these levels of analysis, but they all refer to the general research questions and to the outline of prerequisites for mortgage finance developed during the project. The quantitative analysis of macro-economic indicators was part of the process of developing a country classification system and a differentiated screening approach, but also served to set the two case countries into context.

Work on the two detailed cases (Nicaragua, Ghana) was conducted in parallel with developing the proposed screening methodology. Both case studies served an explorative function and were instrumental in design of the proposed methods. In the case of Ghana a prototype Country Fact sheet was developed as illustration of the general idea, but not completed with all required information. While the material was delivered to the VP-team, it was not followed by a testing or validation process.

The two case countries cannot be said to be representative, but they encompass a variety of cultural-historical differences articulated in the present status of their property rights institutions, housing conditions and their property markets. Perhaps, these cases can be regarded as extreme in some respects (e.g., unsettled post-conflict status (NI) and a complex customary system under transformation (GH)). In neither case are the standard conditions fulfilled in terms of a functioning property registration system (with protection of collateral), sound institutions and a regulated formal property market.

3. Design of screening methodology and prototyping
Methodology development of an assessment of readiness for Danish mortgage finance comprised two components: Drafting of assessment framework in the form of prerequisites for mortgage finance, and a screening approach to assess the compliance with the prerequisites.

Methodology development for screening of readiness was seen as a step in an iterative design process. The proposed four steps of screening were drafted as intermediate ways of assessing readiness and operationalization within the limitations of in-availability of conceptual models and lack of appropriate data as a basis for assessments and screening. The status of methodology development is on one side propositions on prerequisites, on the other a prototype design of screening that is not validated.

A limitation of the proposed screening methodology is a lack of sharp criteria combined with shortage of required information, which means that the proposed screening process is a suggestion on how to cope with analysis of markets rather than a formula for determining the degree of readiness.
4. Qualitative research methods supported by quantitative analysis
The study of the inference between credit and formal property regimes relied primarily on qualitative analysis, but was evidence based as far as permitted through the underlying case studies and other research in the field. The use of quantitative data was playing a supportive role in the logic reasoning applied. Quantitative methods could have been particular useful in comparative analysis of mortgage and property markets, but the inventories found a lack of data, especially where they were most needed in emerging or developing economies.

The area of cadaster and land registration is an empirical research field, while a number of development theories focus on the phenomena of ‘property rights’. Since the operational fields of cadastre and registration belong to the domain of property rights protection, it was possible to link theories on property rights and development, with operational issues.

4. Presentation of the theoretical and/or empirical investigations and findings;

4.1 Inventory and Findings on Danish Mortgage Finance
An in-depth analysis of the Danish Mortgage finance system and its framework conditions was required as a basis for drafting propositions on prerequisites for the functioning of the Danish mortgage finance system in another country context.

Therefore, the Danish mortgage finance system was reviewed from different analytical angles to study 1.) Core features of the financing model and its particularities in comparison with other mortgage finance systems, 2.) Particularities of the 200 year long development path of the system and the Danish mortgage market; and 3.) the legal framework of mortgage institutions in Denmark. Observations were made on the core features of the financing system, and the analysis permitted drawing some conclusions on the inference between the financing system and its framework conditions.

The core principle of the Danish financing model is the balance principle of securitization, as sketched in fig. 4. Housing finance experts underline the strengths of balance principle of capitalization, as a robust model, which is currently considered an option for reforming the failed mortgage securitization system of the US, and for building healthy mortgage markets elsewhere.

![Figure 4. The balance principle of securitization](image)

Advantages of the system stem from its basic simplicity, transparency, standardization, and alignment of risks and responsibility. The mortgage finance system is market based, but the mortgage system has always been tightly regulated, e.g., by regulations on credit conditions (LTVs, loan duration). A healthy incentive structure has minimized the need for state supervision, and has engendered responsible lending practices.

Mortgage credit finance is built on strong property rights registration systems and effective legal protection. Through the balance principle risks in the Danish financing system are largely reduced to credit risks, whereby the relation between mortgage credit and the underlying pledge as security for the loan stands out.
Throughout the history of the Danish mortgage finance system property rights have been well defined and formally registered. Moreover, advanced features of mortgage pledging existed prior to introduction of the first mortgage credit act in 1850. During recent decades activities in the land registry has been dominated by registration of mortgage pledges, whereby an active mortgage market has generated revenues from registration fees equivalent to more than the running costs of the judiciary system.

The economic importance of secure mortgage pledging goes beyond the individual credit arrangement: The real property registration system has served as an impeccable and secure basis for the mortgage finance system that has delivered a major amount of liquidity to the Danish economy for over a century: Currently outstanding mortgage debt is equivalent to the magnitude of GDP.

Collateral security is critically dependent on effective foreclosure. It was shown that foreclosure in Denmark is both swift and effective, while the level of foreclosure even during crisis is low. It was argued that in mature legal systems, collateral security is predominantly dependent on - and sensitive to - valuation and on the Loan to Value ratio (LTV).

**Long development path and building of trust in mortgage finance institutions**

The 200-year development story of the Danish mortgage finance system gave multiple clues to the role of institutions in its development, and demonstrated the dynamics in the mortgage credit market under changing macro-economic tides. Since the risks of the Danish mortgage credit system are largely reduced to credit risk, security of collateral has always been a central issue.

The Danish mortgage finance system had reached an advanced stage of development already in the 19th century, and the depth of the mortgage market prior to WWI reaching about 75% of GDP. Historical documentation permitted identification of factors, which impacted on decisions on adjustments or reforms of the mortgage finance system. The most valuable observations were found to have been made during times of crisis, e.g., during the 1930’s.

**Collateral security and democratization of credit**

The Mortgage finance system was shown to have opened for ‘democratization of credit’ for at least two reasons: Through the original underwriting principle of ‘bricks only’, without consideration of the applicant’s bankability, credit became accessible for all owners of real property, who on the other hand were fully responsible for the loan, knowing of the unmerciful consequences of default. It is suggested that this was possible only through strong collateral security and healthy incentive structures. Furthermore, the low risk environment of mortgage financing and economy of scales in ‘mass securitization’ resulted in lowering the cost of credit.

There were found indications of the Danish mortgage finance system having contributed to economic development and building of a society with lower inequality through its democratization of credit (Glud, 1951), - notably without direct state subsidies.

Paradoxically, the fully market based Danish mortgage finance system weathered the most serious periods of the financial crisis in contrast to the state-subsidized securitization system in the US having an ‘affordable credit’ agenda through the Government Sponsored Enterprises securitizing loans. The Danish model is even recommended by experts for ‘fixing’ the failed mortgage finance systems in the US.

**4.2 Overview of Findings on Collateral Security in Danish Mortgage Finance**

Early exploration of the underlying topics of the research questions showed that the concept of ‘collateral’ was central to the project, and that the Danish mortgage finance system rests on the principle that credit is secured through the pledged properties, and thus presupposes existence of a functioning formal property rights regime. Collateral security holds both a legal and a value dimension in order that the outstanding debt - in the worst case - is covered by the value of the underlying real asses.
Collateral serves as a safeguard against credit risks and provides protection of investors (investments) in various ways. A reduction of credit risks is a condition for lowering the costs of credit. Hence, higher collateral security and lowering of risks open for more affordable credit (all other things equal).

Collateral security was both a point of departure for the project and an object of analysis, because it had to be analyzed, what is ‘collateral security’ through all links in the credit chain. It was explored how ‘Collateral security’ of an individual credit arrangement depends on the wider institutional framework, as well as on the general regulation of the mortgage finance institutions. The mapping out of different aspects of ‘collateral security’ supported development of propositions on prerequisites and a screening methodology for assessing readiness for mortgage finance.

Below is summarized what were found to be the nature and roles of security of collateral at different levels of the Danish mortgage financing system. As illustrated by the list, collateral security relies on many other factors than the simple registration act of a mortgage pledge, although that is a fundamental function.

‘Collateral security’ as safeguarded through the individual credit arrangement:
- The core function of collateral is mortgage pledging as an inherent legal precondition of individual mortgage credit arrangements.
- Collateral security has both a legal and value dimension. ‘Value’ becomes the more critical part in a functioning legal system. Therefore collateral security of an individual mortgage credit arrangement depends on the actual ‘Loan To Value’ ratio, which in turn is dependent on application of conservative valuation practices, so as to have a buffer against future fluctuating market prices.
- Historically a minimum value of collateral was defined both for reasons of collateral security and as a social safeguard for poor homesteads against possible consequences of a default;
- The original principles of lending in the Danish Mortgage Credit Associations applied the principle of ‘bricks only’ (without (explicit) underwriting of the applicants credit status), and this was presumably possible only due to the protection provided against credit risks through solid collateral security.

‘Collateral security’ is dependent on the wider institutional level:
- The mortgage credit system is generally dependent on functioning legal systems and public infrastructure, transparency, etc.
- Of primary and critical importance for collateral security is access to effective foreclosure, which has been functioning in Denmark at least since the first Danish mortgage credit act in (1850).
- The legal registration system provides strong protection of lenders (mortgage pledges) against deterioration of the value of the pledged property rights in case of subdivisions, mutations, etc.
- Collateral value is generally protected through the planning system by securing a certain level of predictability; Collateral values are also protected through mandatory insurance coverage.

Components of ‘Collateral security’ at the level of Mortgage Credit Institution:
- The general level of ‘collateral security’ is safeguarded through strict principles laid down in the Mortgage Credit Act, including the incentive structure embedded in the securitization model based on the balance principle
- The principle of ‘security of collateral’ generally depends on adhering to prudent valuation practices. The Danish Mortgage Credit Institutions are responsible for conducting conservative valuations pursuant to the Mortgage Credit Act.
- Legislation governing Danish Mortgage finance regulate maximum levels of LTVs for each type of credit arrangement, whereby the finance system is provided some protection against systematic credit risks during low markets;
- Enhancement of ‘collateral security’ was historically provided through solidarity principles of ‘joint and several responsibility’ of borrowers in each mortgage series;
- New principles of mortgage lending define a second type of general maximum of LTV calculated as the total amount of outstanding mortgage credit held by the MCI relative to market values of all underlying real assets, a general level to be monitored (statistically) at regular intervals. Hereby new regulations define two levels of ‘collateral security’: the individual level at issue of loan at the time of issue, and the statistical level to be monitored continuously.
Investors are protected against risks of default by the MCI through the solidity of financial institutions, regulated by capital coverage requirements. New and tighter regulations in this regard are problematic, because higher levels of capital coverage come at a high cost, while the Danish mortgage finance system has proven to be robust within previous levels of capital coverage.

It was found that the low risks for investors in the Danish mortgage finance system had resulted in cheaper mortgage credit over time, and that ‘Security of collateral’ opened for access to credit for all owners of real properties (above a certain minimum value) regardless of standing.

Effective foreclosure has eliminated the attractiveness of strategic defaults, and the mortgage finance institutions in Denmark have experienced a low level of defaults even during times of crisis. It is suggested that effective foreclosure, combined with the incentive structures of the financing system, has resulted in lowering risks, thus lowering the cost of credit. In this way effective foreclosure can be seen in the long run as increasing access to credit. This effect is to be seen in comparison with the deterioration of markets and asset values caused by a lack of effective foreclosure, as encountered e.g., in those US states not having access to recourse.

4.3 Development of Propositions on Prerequisites for Danish Mortgage Finance

**Prerequisites for Development of Danish Mortgage Finance**

The setting up of a framework defining “Prerequisites for Danish Mortgage Finance” constituted a central component of the study. Propositions were developed through inference of findings and a synthesis of two different types of input:

a. Interpretation of the findings on the nature of the Danish Mortgage Finance system, its development path and its dependency on external factors;


The setting up of propositions followed the structure of the UN-ECE principles closely with adaptations as argued in Part A. The different sources formed a coherent pattern of conditions for and sequencing of mortgage finance development. However, the UN-ECE principles were designed for another application than defined by the present study, and for a specific market segment. Therefore the definition of propositions on prerequisites for DMF relied on elements of abductive reasoning.

<table>
<thead>
<tr>
<th>“Housing Finance Systems for Countries in Transition, Principles and Examples” (UN-ECE 2005)</th>
<th>Propositions on ‘Prerequisites for Mortgage Finance Development’</th>
<th>Background theories (ref. to Part C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Economic Prerequisites</td>
<td>1. Economic Prerequisites</td>
<td>➢ Macroeconomics</td>
</tr>
<tr>
<td>b. Institutional Prerequisites</td>
<td>2. Institutional Prerequisites</td>
<td>➢ New Institutional Theories</td>
</tr>
<tr>
<td>c. Financial sector-specific prerequisites</td>
<td>3. Collateral Prerequisites (financial prerequisites not included in analysis)</td>
<td>➢ Property Economics and Collateral theories</td>
</tr>
<tr>
<td>d. Housing sector-specific prerequisites</td>
<td>4. Housing policy and market prerequisites</td>
<td>➢ Urban Land Economics; Housing Economics</td>
</tr>
<tr>
<td>e. Housing subsidies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5. Relations between conceptual framework and background theories**

The UNECE (2005) framework was compared with recommendations by housing finance experts, e.g., Renaud (2008) and Harvard Joint Center for Housing Studies (2005). A consistency was found among recommendations in different sources, but the proposed set of prerequisites represents a modified structure with elements of interpretation. The modifications were made on the grounds of centrality of security of collateral for DMF, and were grounded in the theoretical discussions of topical theories, see fig. 5.
Within this general structure the specific prerequisites were drafted by merging observations deducted from prerequisites of the mortgage pledging process and other features from the analysis in Part A, which resulted in the following proposed structure:

### Propositions on Prerequisites for Danish Mortgage Finance

1. **Economic prerequisites:**
   - Macroeconomic level stability
   - Microeconomic level affordability (income, income distribution, employment)

2. **Institutional prerequisites:**
   - Stable institutions - overall governance
   - Working legislation & Rule of Law
   - Detailed legislation on property rights protection
   - Sound institutions in the domain of landed property

3. **Collateral prerequisites:**
   - Secure property transactions and mortgage pledging
   - Effective foreclosure and access to collateral
   - Security of collateral (mortgage pledges, collateral quality, and value)
   - Access to information for assessing collateral and credit risk

4. **Housing policy and market prerequisites:**
   - Housing policy and a clear role for the public sector
   - Demand for new housing and upgrading
   - Land supply and physical infrastructure
   - Construction sector and urban housing markets

### Figure 6. Propositions on prerequisites for mortgage finance development and the role of the real sector

The framework operates with both the concept of ‘security of collateral’, as well as property rights protection, which is a broader term. Collateral security can be considered a special feature within ‘protection of property rights’, but collateral security is also dependent on wider issues, such as e.g., rule of law. For these reasons the framework can be considered a general response to the research question of ‘what is collateral security’.

What falls outside these two concepts is the issue of land delivery for housing, a critical feature for developing of a housing market, through both impacting on collateral quality and on affordability.

A feature missing in the proposition in its present form is the prerequisites of a functioning housing property market, which is implicit from the framework the above.

The propositions and the listed issues of prerequisites were based on coherent recommendations by housing experts, and an in-depth analysis of the Danish mortgage finance system. The composition and ordering was made as a design process with a view to logical ordering of topics. The discussion of background theories (Part C.) supported the case for including the mentioned issues in the framework, as illustrated in fig. 5.

For these reasons, it is suggested that the logical mode of the propositions represents a possible formal framework, and that the propositions need to be tested and validated in a continued process. Further elaboration of specific criteria associated with the prerequisites is required for assessment of readiness of particular markets, but that has been left open. This is a structure of general requirements (excluding financial prerequisites), not a specification of minimum requirements.

### Discussion

With reference to (Cadgas and Stubkjær, 2009, p. 878), a conceptual framework is an activity of theory building. It is suggested that the propositions on prerequisites for mortgage finance represent such a framework with an inherent hierarchical order or increasing level conceptual detail. The framework illustrates that the importance of property rights in mortgage finance development goes beyond the particularity of pledging individual property rights.

The framework is also forming an implicit hierarchical order with indications on sequencing in screening for readiness for mortgage finance, as reflected in the proposed screening methodology in Part B. Clearly there can be no collateral security without stability in a country, and without a functioning legal system. In
addition to legal registration and mortgage pledging, a critical requirement is functioning foreclosure with effective access to collateral in case of default, access to information, etc. All in all these prerequisites add up to being rather demanding considering the conditions found in many countries of the world.

The framework may not provide much news to housing finance experts, but it is suggested that the framework serves as a statement in the debate on the issue of the effect of land titling on access to credit. The proposed framework shows that the perspective of land titling – although a prerequisite - is too narrow, and that if land titling is not resulting in a growth in real credit, other explanations could be logically sought in for example a lack of income earning opportunities, too high inflation rates, etc. , without rendering land titling useless per se. In this way the framework may serve as a conceptual framework for discussions on the role of land-titling in development of credit.

Another possible interpretation of the framework is application of the framework in reverse to guide policies. By redirecting the perspective the framework could possibly be applied for aligning purpose and interventions in the land sector in support of mortgage finance development and economic development.

4.4 Global Information Sources on Cadaster, Land Registration and Property Rights Protection

In Part B of the thesis a review was made of potential information sources on property rights and registration systems around the world in support of developing propositions on a strategy to screening of the readiness for mortgage credit implementation.

The unanimous agreement on the centrality of the property rights regime for mortgage credit, and for economic development in general, was found to be contrasted by the nearly global lack of suitable indicator data on the state of implementation of land registration systems and land management for urban development and mortgage pledging. The research documented that the Land (real) sector produces virtually no statistics or indicators of use in macro-economic analysis by conducting an extensive inventory of possible sources of information, which included

- Five different Country inventories on cadastre and land registration systems (for example the ‘Cadastral Template’);
- Five Comparative Studies on Transaction Costs and foreclosure;
- Comparative studies and Monitoring Systems in Land Administration and Land Governance, including a series of World Bank studies and proposed monitoring systems from 1999-2010.

Most advanced were the efforts the World Bank and its global partners in building monitoring systems Land Administration (Governance). The WORLD BANK studies have been conducted by large international teams of experts, country case studies, panel assessments, adjustments, etc. since 2000, and taken for the form of substantial studies, such as:

2008: Internal Draft WB Conceptual Framework Matrix
2010: Towards a General Framework for Assessing Land Governance, (5 Thematic Areas, 21 Land Governance Indicators, 80 Dimensions)

As indicated by the variance in indicators, each version of the monitoring systems developed by the World Bank and its global partners are quite different in nature, and may appear to be complementary. However, none of the proposed monitoring system in operation, none of the above versions seems to address monitoring of property rights in more mature markets, and they do not cover issues of central importance for mortgage pledging.
The inventory demonstrated the state of the art of monitoring in the field of property rights with fractional information and embryonic monitoring systems, which form a major impediment to operationalization. It was found that the status of building Monitoring Systems (Comparative Studies) had limitations such as e.g.

- No conceptual model found of ‘property rights protection’, nor composite indices of ‘quality of land administration’, not to mention ‘security of collateral’;
- The link between land and housing (‘real property’) is not always explicit;
- The taxonomy of land registration systems applied is inadequate for representing quality of protection in principle (Deed registration vs. Title registration);
- Many comparative studies are dedicated to single issues or not (designed to be) repeated or suited for general operationalization;
- The monitoring systems reviewed do not represent collateral security issues (market size, mortgage pledging, foreclosure);
- Monitoring systems reviewed do not represent land supply and market issues;
- Implementation of the monitoring systems were found to be incomplete or not (yet) in operation.

The research has produced a detailed inventory of monitoring systems on land administration (Governance), with an analysis and profiling of available indicators and monitoring systems related to cadaster, land registration, and land administration/governance. The inventory showed that there is such a scarcity of structured information and comparable data on property rights protection, land markets, mortgage pledging and foreclosure, that I call it an information void.

For these reasons no global monitoring data on the status of cadastres and land registration were found to be adequate or suitable for screening (in their current form and coverage). Before progress can be made in building monitoring systems, it is suggested that there is needed development of universal conceptual models of key phenomena applicable as a basis for building monitoring systems.

4.5 Macro-economic Indices and the issue of property rights’ protection

"Finance is a derivative of the real sector" (Sheng, 1999)

The macro-economic importance of monitoring property rights protection and collateral values is leading to the question of how to deal with the information void when screening readiness for mortgage financing.

The central role of property rights protection in development is contrasted by the information void, so the intriguing relations between property rights and the macro-economy are difficult to quantify or monitor. Sheng’s statement (1999), suggest that finance is an outcome of the conditions in the real sector, which means that the indicators of the financial sector may as well serve as an (outcome) indicators of the real sector.

It is suggested that macroeconomic indices in general are relevant for monitoring land institutions because they represent:
- Economic and institutional prerequisites for mortgage market development;
- Market conditions and the business environment; and because
- Some macro-economic indices include (sub-)indices on property rights protection.

The role of property rights protection in economic development is represented in the economic development model developed by the World Economic Forum as a foundation for their “Global Competitiveness Index”. Among the 12 pillars of competitiveness, Pillar one represent ‘Institutions’, and property rights protection is represented as subindicator 1.01 of ‘Institutions’. In this way, the fundamental nature of property rights protection is underlined as a condition for economic development. Since Pillar VIII Financial market sophistication, belongs to the factors emphasized at the second stage of economic development, a priority order of development is also suggested through the model of the World Economic Forum.
A few global monitoring systems include sub-indices related to property rights protection, e.g.,
- Ease of Doing Business (World Bank)
- International Property Rights Index (Property Rights Alliance)
- Index of Economic Freedom (Heritage Foundation)
- Worldwide Governance Indicators (World Bank)
- Corruption Perception Index (Transparency International)
- The Global Competitiveness Index (World Economic Forum)

An analysis of the above showed that these sub-indices measure different dimensions of ‘property rights’, but some sub-indices have a similar character. In order to explore the indices further, an analysis of macro-level indicators was conducted both of the consistency among the global rankings of countries worldwide by the selected macro-economic ratings and classification systems, and by a more detailed (quantitative) analysis of a subsection of ratings representing 20 countries, including the case countries.

The regression analysis showed correlation coefficients between 0.53 and 0.96 in the selected data set with highest coefficients between the corruption indices CPI and the governance indices of WGI. In the selected 20-country data set, the World Economic Forum indicator on Property rights was found to correlate at confidence level *** with CPI (0.88) and with WGI, the Worldwide Governance Indicators (0.90) and its sub-indices.

The analysis suggests that when information on property rights protection is unavailable, then the macro-economic ratings on Governance and Transparency may serve as proxies. These finding are consistent with development theories on the role of property rights in economic development, as discussed in Part C.

On this basis it was concluded that macro-economic Indices may serve as proxies for rating of ‘Property Rights Protection’ in screening of readiness for mortgage finance development, as a consequence of the causal factors substantiated by the underlying theories discussed in Part C. However, such indices and sub-indices are crude measures, as discussed in the thesis.

4.6 Screening Methodology

The review found current indicators on property rights protection and land management to be fractional at best. Instead, selected macro-level indices and classification systems were applied for proposing a classification system of economies around the world into coarse grouping of readiness for mortgage system
development with a top group largely defined based on the World Economic Forum classifications of economies. By segmenting the potential market a diversified approach for feasibility studies was lined out.

A Screening Method was proposed based on the idea of global market segmentation, and diversified strategies of screening applied for each segment, as documented in the thesis. The method proposed includes the following steps:

**Step 1: Global Market Segmentation by the help of macro-economic classifications and ratings**
- **The top**: Countries classified as innovative or in transition from efficiency driven to innovative by World Economic Forum (including less than 50 countries);
- **The Bottom**: Countries classified as heavily indebted and poverty criteria, by World Bank and UN.
- **The Middle**: The group of remaining countries (about 50 countries).

**Step 2: Rapid Assessment focused on Constraints**
An in-country Feasibility Study was conducted in Nicaragua

**Step 3: Country Fact Sheets (Standard format of EMF or Expanded version as prototyped)**
Application of the standard format of ‘The European Mortgage Finance country fact sheet’ for top segment,
An expanded ‘Country Fact Sheet’ was designed for other cases and prototyped for the Ghana case study

**Step 4: Detailed Legal and Market analysis**
Sketched for the case study of Ghana, but incomplete. Requires in-country analysis etc.

The approach to screening of readiness was inhibited by shortcomings in international monitoring systems, which hindered developing a rating of countries. Instead, a structured approach was developed to exploring conditions in countries through an iterative and structured process of profiling the market conditions by use of available information sources. The assessment of readiness and potential is left open to financial experts.

The initial steps were conducted or prototyped through the case studies in cooperation with VP Securities A/S, but the proposed methods of screening have not been validated. A long list of relevant indicators for readiness for mortgage finance was elaborated in Part B, but in practice a sub-set has to be defined.

5. Concluding answers to the research questions and discussion of findings

5.1 Results regarding specific research questions (VP Securities A/S)

The original vision of the study of establishing a rating system on readiness for Danish mortgage finance was not achieved due to insurmountable shortcomings of underlying concepts and the information void of monitoring data on property rights protection. Instead, progress was made in clarification of the prerequisites for mortgage finance development, and in developing a structured approach to screening within the limitations encountered. The proposals were developed as prototypes in connection with two case studies (in Nicaragua and Ghana), and supported by qualitative and quantitative analysis of global monitoring systems.

The drafted propositions on prerequisites for Mortgage Finance Development were not validated, but underpinned by a synthesis of findings from selected development theories. If the propositions on prerequisites can be validated, then the framework contributes to the understanding of relations between the basic concepts of real credit and property rights protection, and hereby to theory building. The propositions on prerequisites served as a framework for discussing strategies for engendering mortgage finance development.

The explorative analysis of available monitoring systems of relevance for screening of readiness for mortgage finance development showed that there was no functioning international monitoring system (populated with data) on property rights protection. However, it was found that some global macro-economic indices may serve as proxies for property rights protection in the absence of data from the real sector.

While the importance of real property institutions is widely acknowledged by a broad spectrum of development economists and in other research areas, the status of property rights protection and institutions...
is underrepresented in measures of economic development, such as in various ratings systems applied by the financial world in their risk analysis at the macro level. Where indices on ‘property rights’ are included, the indices lack monitoring data from the land sector, and rely largely on perception based surveys, as documented in Part B. It was found that even in the latest developments of building comparable monitoring systems in land governance by the World Bank, the framework lacked indicators of importance for housing and real credit.

In this way, the analysis of specific research questions formulated from the perspective of mortgage finance development provided clarification on the financial sector requirements to the land administration sector. It is suggested that these findings can be regarded as a research result.

The research project substantiated the importance for mortgage credit development of establishing better indicators on property markets and protection of property rights, including mortgage pledging and foreclosure, based on both theory and practice. The financial sector asks for information on cadasters, land registration, property valuation, enforcement, etc., and for more qualitative measures e.g., on the quality of property rights protection and ‘security of collateral’. Hereby, it is suggested that shortcomings identified by the inventory and analysis form a research agenda for future development of the land professions in the service of economic development.

The Role of Land Institutions in Affordability of Housing and Credit

The framework of prerequisites underlined the role of land supply for the housing market, and the analysis and qualitative reasoning resulted in specific findings connected to the concept of ‘affordability’.

Since affordability of housing is technically a ratio between housing costs and household income, both factors are of importance. As Glud remarked (1951), the development of Danish mortgage finance system depended on income opportunities. Cheaper mortgage credit alone cannot make housing affordable, if e.g., there is insufficient capacity to repay the mortgage credit, or if housing supply is constrained, so that market prices are pushed up. Financing and market prices are not neutral to each other.

The effect of limited land supply was shown in the case of Ghana to reduce affordability. Bottlenecks in supply distort the land market with negative spill-over effect on affordability.

While ‘affordability’ is a noble social goal, its application as a political term may blur what are the essential requirements for lowering the costs of housing. The impact of so-called ‘affordable housing policies’ on the US mortgage market was discussed in relation to how it might have impacted on lowering underwriting standards, and as having been a contributing factor to the financial crisis. It was shown that ‘affordability’ is a factor price ratio, and that theory (North, 1990) considers institutional change to be stemming from changes in factor price ratios (or changes in preferences).

It was argued that the general interest rate level serves as a measure of institutional uncertainty through the connection between uncertainty, risks and interest rates. Since functioning institutions reduce uncertainty, the general interest rates represent the financial market’s assessment of institutional uncertainty. Moreover, theoretical support was found for considering the lack of protection and order in property rights as the reason behind the high interest rates in Africa (Beck et al., 2009). It was argued that in underdeveloped markets low affordability of housing is predominantly caused by malfunctioning land institutions rather than lack of finance. Therefore it was suggested that ‘affordability of housing’ (by including both the factors of housing costs and interest rates) may serve as a powerful indicator of the quality of land institutions, as well for the market potential for mortgage finance.

5.2 General Findings and Contributions to new Knowledge

On the Inference between property rights protection and mortgage credit

The research collated and analysed observations by economists and findings of economic development theories, that described the inference and dynamics between the real and the capital markets, and how the property market and the overall economy interact in bidirectional ways. Theoretical issues were discussed in the context of the development path of Danish mortgage finance and the case studies.
Through a synthesis of the findings from academic sources and analytical reasoning conclusions were drawn regarding the dynamics between land rights, collateral security and real credit impacted by factors such as e.g.:

- Formal/informal property regimes, market size, and the distribution of wealth (inequality)
- Legal origin and the level of formalism of the judicial system
- Transaction costs, legal enforcement and effective foreclosure
- Incentive structures and commitment mechanisms to honour debt
- Ethics and moral hazards of land institutions.

It was shown that an ineffective foreclosure process burns up the value of assets (Djankov, 2008), and lack of debt enforcement dries out mortgage markets. Performance in the financial market was seen as dependent on the incentive structures embedded in both legislation and in financing systems. Market discipline was shown to be enhanced by the transparent and robust, vertically integrated securitization model of the (fully market based) Danish mortgage finance system that has withstood crisis, in contrast to the securitization system of the US mortgage market through government sponsored enterprises.

Pivotal to development of mortgage markets is the existence of an institutional mechanism to ensure a ‘commitment to honour debt’ (North-Weingast, 1989) with reference to the historical case of early European financial revolution, linked to legitimate governments that could tax credibly, and therefore pay their debts. ‘Security of collateral’ is the result of a commitment mechanism both at overall level and in respect to the specific credit arrangement.

The debate on the property market and security of collateral has distinct features whether in the context of advanced economies with formal property rights regimes or in developing economies with widespread informality. The thesis argued that the relative importance of factors of mortgage finance and the property rights regime differs depending on stage of development in concordance with the economic development model developed by the World Economic Forum, see Figur 7.

In under-developed mortgage markets priority issues are at first ‘Institutions’, in particular protection of property rights. It was argued that at the initial stages of mortgage finance development, expansion has to take place through the middle market segment, and by reducing uncertainty in the framework conditions. Therefore strategies in support of increasing access to credit need to focus on titling of property rights in the middle and upper housing segments. This will increase the volume in the formal property market and mortgage markets and allow expanding the tax base, with the potential of increasing revenues and decreasing the costs of credit, and improving urban quality.

In Denmark, the mortgage finance system was at first expanded and consolidated in the middle segment, while later expanded to the lower segments of the market, Part A.

It is suggested that a differentiation and segmentation of markets may help aligning policy, goals and interventions in land formalization and registration of real property in support of economic development in general and mortgage financing in specific.

It was found that mortgage finance is a colossal power-engine in the economy, which is difficult to set in motion, and once in full function – difficult to control – with reference to experience in the Danish history of mortgage finance.

In developed economies the colossal power of mortgage markets is demonstrated both in growth periods and during decline, and the collateral rate was shown to impact on booms and busts (Geanakoplos, 2010). It was found that the credit market has the upper hand over the property market in advanced economies, and it was argued that in well-functioning legal regimes ‘valuation’ is the Achilles Heel of mortgage finance.

In conclusion, the land and immovable property sector were found to be behind the financial sector in accounting for assets, and the land sector is faced with huge challenges of meeting the financial sector information requirements, whether in established or new mortgage market (for different reasons).