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New Directions: Cambridge–Maastricht Symposium 2001

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This volume contains the papers of the Cambridge–Maastricht Symposium 2001. The Department of Land Economy, University of Cambridge, UK, hosted the second Symposium which was attended by 34 participants. The papers in the Symposium program are a testament to the methodological growth in residential and commercial real estate research. Granted the breadth of the topics covered in the first Symposium meeting in 2000, and the *Journal's* motivation for first Special Issue, we decided to follow essentially the same format for the second meeting. There was again no overall theme of the program but the range of topics reflect the current state of real estate finance and economics research. The content and range of subject matter of the program was primarily determined by the distribution of the submissions received. A total of 12 papers were presented, six papers concerned with the European real estate market issues and six focusing on the US market issues. The papers fall into six overlapping groups: mortgages, rents, housing, corporate real estate, valuation, and real estate returns. After the normal refereeing process of the *Journal*, nine papers are published in this volume.

In the first two papers by Edelstein and Urošević and Feldman and Ben-Shahar they consider the design of the optimal loan contract and signalling and screening mechanisms, respectively. “Optimal Loan Interest Rate Contract Design” by Robert H. Edelstein and Branko Urošević develop utility-based models for determining optimal contract rates for loans in the presence of risky, symmetric information. The design of the optimal loan interest rate contracts depends upon the volatility of, and co-variation among the market interest rate, borrower collateral, and borrower income, as well as the loan contract time horizon and the risk preferences of lenders and borrowers. The authors demonstrate that for a risk-averse borrower with stochastic collateral, variable interest rate contracts are, in general, Pareto optimal. If the collateral value and/or borrower’s future income are positively correlated with the market interest rate, optimal loan interest rate contracts will allocate more interest rate risk sharing to the borrower *vis-à-vis* the lender than would be the case in the absence of such correlation. In the dynamic model the optimal loan interest rate contract often exhibits “muted” responses to the changes in the market interest rate, making fixed rate loan contracts close to the optimal design.

In “Signaling–Screening Equilibrium in the Mortgage Market” David Feldman and Danny Ben-Shahar combine signalling equilibrium and screening mechanisms to demonstrate a signalling–screening separating equilibrium. In this model, mortgage borrowers are assumed to signal credit trustworthiness by acquiring a credit records, and lenders are assumed to screen borrowers into two types, low- and high-risk borrower, differentiated by their default risk. Each contract is designed with maturity and risk premium to produce zero profit when selected by an individual. Because of an exogenous probability of default, it is less costly for the low-risk borrower to select a mortgage contract that endogenously increases the default probability and hence select a contract that has a shorter maturity. The authors show that if the signalling costs are sufficiently small, then signalling–screening equilibrium will be Pareto superior to a corresponding screening equilibrium.

The second set of papers by Ambrose and Sanders, and Pereira, Newton and Paxson study the default and prepayment behavior of commercial mortgage-backed securities and prepayment and default options in the British fixed-rate endowment mortgage, respectively. In “Commercial Mortgage-Backed Securities: Prepayment and Default” Brent Ambrose and Anthony B. Sanders conduct an empirical study to examine the default and prepayment behavior of commercial mortgage-backed securities (CMBS). The likelihood of default and prepayment are estimated using proportional hazard rate function, and then they are regressed against a set of predetermined variables using a maximum likelihood technique. The authors find that yield curve changes and interest rate volatility have negative and significant effects on mortgage termination. The spread between current interest rates and mortgage contract rate and spread between AAA and BBB bonds have significant positive relationships with the default and prepayment hazards. The relationship between LTV and default is not statistically significant, but LTV has a positive effect on prepayment. This LTV results fail to support the theoretical claim of a standard option pricing model that default increases as LTV increases on a loan.

In “Fixed-Rate Endowment Mortgage and Mortgage Indemnity Valuation” José Azevedo-Pereira, David Newton and Dean A. Paxson apply the contingent claims model to study the prepayment and default options embedded in the British fixed-rate endowment mortgage, with a capped mortgage indemnity guarantee. The authors model the three components of a “without profits” endowment mortgage, namely a mortgage loan contract, a zero coupon bond component whose value at maturity will be equal to the amount borrowed, and an assurance policy with a cap, which considers the prepayment and default option simultaneously. For a “without profits” endowment mortgage, terminated early, the value of the borrower’s debt depends on the value of the endowment (zero coupon bond) portfolio and so its behavior is determined by the evolution of interest rates. This results in significant differences between the values of the options embedded in repayment and endowment mortgages and, consequently, also on the overall values of these mortgage contracts.

Pereira, Newton, and Paxson provide numerical solutions for the variables associated with a common mortgage contract specification proposed by some British banks and building societies: a mortgage contract including both an arrangement fee and an early

termination penalty. The value of the mortgage varies in a complex fashion with the value of the remaining mortgage payments, A , and also the values of the prepayment and default options. When house prices move to very low levels, default is certain to occur at the next payment date and the level of the house price exerts a major influence on the value of the mortgage contract. The values of insurance coverage coinsurance are linked to the evolution of the default option. When interest rates are high, default is unlikely unless house prices are very low and so the insurance products only become valuable under these conditions. The evolution of interest rates impacts A and the prepayment option which in turn exerts opposing pressures on the value of the mortgage contract. The value of the prepayment option is mainly driven by the interest rate level in combination with house prices and is large when rates are low and house prices high. In comparing the repayment and endowment mortgage contracts, the authors demonstrate that the main structural differences in terms of the relative weights of the different components are registered by A and the value of the prepayment option, whose relative weights tend to be higher in the endowment mortgage case.

The papers by Hendershott and Ward, and Soderberg and Gunnelin examine retail lease contracts in the USA and office rental term structure in Stockholm. In “Valuing and Pricing Retail Leases with Renewal and Overage Options” Patric H. Hendershott and Charles W. R. Ward investigate the possibility to design lease contracts that retain the positive benefits of the imbedded options yet do not complicate the lease valuation. It is shown that, if landlords have call options on overages and give tenants a renewal put option, it should be possible to structure the contract to equate the values of the two options by adjusting the ratio of initial sales to the sales threshold—setting the overage options the appropriate distance out of the money. The authors calibrate the value of various leases using Monte Carlo simulation. The valuations are first carried out in a risk-neutral environment and then the variation in initial rent levels on the three leases with options that would be required to equate their values to that of the no-option lease is estimated. The distribution of potential present values and IRRs is far wider for the overage lease than the no-option lease and far narrower for the renewal lease. However, if the ratio of the sales threshold to initial sales is set appropriately, both the initial rent and the distribution of potential present values and IRRs for the dual overage-and-renewal option lease can be made remarkably similar to those of the no-option lease.

“Term Structures in the Office Rental Market in Stockholm” by Bo Soderberg and Ake Gunnelin is an attempt to estimate the shape of the rental term structure for office leases in Stockholm commercial business district. The authors have chosen a simple model specification, in which property and contract specific attributes affect the equilibrium rent in a multiplicative way. The leases in this study are subjected to an inflation adjustment clause, i.e., a certain fraction of the initial lease payment is annually adjusted upwards (only) with the change in the consumer price index. For each lease in the sample that is not fully index adjusted the authors define a hypothetical “equivalent” lease and solve for the equilibrium base rent of the equivalent lease. The estimated term structure seems to predict the future evolution of the rent level reasonably well. For 1990 the observed negative and highly significant term structure coincides with the peak in property prices. In terms of Grenadier’s models, the negative term structure indicates that the spot rent in 1990 was

close to (or at) the reflecting barrier, that is, the market participants expected a decrease in rents and property prices in the nearby future.

In “Duration of Residence in Rental Housing Market” Yongheng Deng, Stuart Gabriel, and Frank Nothaft estimate a proportional hazard model for duration of residence in rental housing. In this model, the hazard function is defined as the product of a baseline hazard function, which describes the overall shape of the hazard rate for termination of rental housing occupancy over time, and a set of proportional factors including housing structural characteristics, economic factors, and demographic determinants of duration of residence that vary over time. To estimate the proportional hazard function of residence duration, the authors employ rich data from the CPI housing sample to construct duration of residence and information from the American Housing Survey and other metropolitan economic information in order to proxy time-varying covariates of duration of residence. The results provide evidence of high tenant turnover rates at about 3 years of residence. The duration of residence is observed to be highly time dependent with significant variation across individual units and market segments. During periods of relatively low mortgage interest rates and/or increasing house prices, duration of rental occupancy is reduced. The results also indicate that median housing costs, public housing share of the rental stock, poverty rate, and African American and Hispanic share of tenant households are among those factors that positively affect tenant turnover hazard rates and hence are negatively related to tenant residence duration. Simulation results further indicate the sensitivity of duration of residence to housing locational and structural characteristics.

In “Board Composition and Control of Shareholder Voting Rights in Real Estate Investment Trusts (REITs)” Chinmoy Ghosh and C. F. Sirmans examine the impact of board composition and monitoring on the performance of Real Estate Investment Trusts (REITs). The authors use two separate models. In the first model, a single equation approach is employed to investigate the interaction of various ownership measures and CEO characteristics with board independence, and performance. The results indicate that that increased outsider director representation on the board is associated with increased market-to-value ratios as outsider representation climbs to 50%, beyond which the benefits decline.

The second model estimates a simultaneous equation system with performance, board independence, and CEO stock ownership as endogenous variables and nine exogenous variables. While the results from the two-stage model are similar to those of the single equation model, the evidence on monitoring benefits of a higher percentage of outside directors on REIT boards is weak at best. Furthermore, REIT performance is observed to be significantly and negatively related to ownership of shares of the CEO, which points to the presence potential agency problems.

In “The Conditional Distribution of Real Estate Returns: Relating Time Variation in Higher Moments to Downside Risk Measurement” Shaun Bond and Kanak Patel investigate asymmetric properties of the UK property stock returns and the US REITs. The knowledge of the shape of empirical distribution of returns have important implications for asset pricing, risk management, and performance evaluation. For instance, investors would be willing to accept lower return on property stocks relative to other assets if these stocks have lower negative co-skewness. The key focus in the study is on the GARCH

model with student's t distribution and the autoregressive conditional density function model of Hansen (1994). The results from the models are generally consistent with previous applications of GARCH models to financial data, indicating a high level of persistence in volatility. In the test of the skewness hypothesis, 13 out of 32 companies in the sample reject the null hypothesis of a conditional t distribution in favor of the constant skewed t distribution. However, on the evidence of time varying skewness, linking the economic cycle and the skewness parameter, was found to be weak.

One of the greatest pleasures of organizing Cambridge–Maastricht Symposium comes from the large number of colleagues who offered us valuable advice, debate, and inspiration. We owe very special thanks to the authors, discussants, the editorial advisory board, and referees who generously contributed to the second Symposium meeting. We should also like to express our gratitude to Mr Jon Zehner, Director, J. P. Morgan, to Mr Stephen Brown, Research Officer, the RICS Foundation, for sponsoring the Symposium and the Special Issue. Finally, we are also grateful to Department of Land Economy, and Magdalene College, University of Cambridge, for hosting the Symposium meeting.