



FITXA IDENTIFICATIVA

Dades de l'Assignatura

Codi	42216
Nom	Models de renda fixa (ampliació)
Cicle	Màster
Crèdits ECTS	4.0
Curs acadèmic	2021 - 2022

Titulació/titulacions

Titulació	Centre	Curs	Període
2081 - M.U. en Banca i Finances Quantitatives 09-V.1	Facultat d'Economia	2	Anual

Matèries

Titulació	Matèria	Caràcter
2081 - M.U. en Banca i Finances Quantitatives 09-V.1	2 - Matèries optatives	Optativa

Coordinació

Nom	Departament
TORRO I ENGUIIX, HIPOLIT	113 - Economia Financera i Actuarial

RESUM

Aprofundir en el coneixement de mètodes avançats de modelització en temps continu de tipus d'interès, valoració d'actius de renda fixa i la seva aplicació per al mesurament i gestió de riscos.

CONEIXEMENTS PREVIS

Relació amb altres assignatures de la mateixa titulació

No heu especificat les restriccions de matrícula amb altres assignatures del pla d'estudis.



Altres tipus de requisits

La impartició de l'assignatura Models de renda fixa (ampliació) requereix coneixements previs de la següents matèries:

instrumentals:

- Econometria financera
- Processos estocàstics

teòriques:

- Valoració de actius
- Models de renda fixa

Relació amb altres assignatures:

Els coneixements impartits en aquesta matèria són convenient per a altres disciplines com "mesurament de riscos financers" i "gestió bancària" així com "macroeconomia en finances"

COMPETÈNCIES

RESULTATS DE L'APRENENTATGE

Aprofundir en el coneixement de mètodes avançats de valoració d'actius de renda fixa i la seva aplicació per al mesurament i gestió de riscos analitzant quins models poden utilitzar-se per resoldre problemes concrets.

DESCRIPCIÓ DE CONTINGUTS

1. Tema 1. Introducció

- Anàlisi de la ETTI: Objectius i metodologia
- Possibles aplicacions

2. Tema 2. Models en temps continu

- Models endògens
- Models endògens unifactorials
- Models endògens multifactorials
- Models endògens amb salts
- Models exògens



3. Tema 3. Valoració d'actius derivats

- Resultats obtinguts en la literatura
- Valoració amb models unifactorials
- Valoració amb models multifactorials

4. Tema 4. Resum i conclusions

VOLUM DE TREBALL

ACTIVITAT	Hores	% Presencial
Classes de teoria	40,00	100
TOTAL	40,00	

METODOLOGIA DOCENT

Classe magistral, pràctiques en aula i pràctiques amb ordinador.

AVALUACIÓ

Avaluació contínua (exercicis, problemes) i examen escrit final.

REFERÈNCIES

Bàsiques

1. Ahn, C.M. and H.E. Thompson (1988). Jump-Diffusion Processes and Term Structure of Interest Rates. *Journal of Finance*, 43, 1, 155-174.
2. Aït-Sahalia, Y. (1996a). Testing Continuous-Time Models of the Spot Interest Rate. *Review of Financial Studies*, 9, 2, 385-426.
3. Amin, K.I. and A.J. Morton (1994). Implied Volatility Functions in Arbitrage-Free Term Structure Models. *Journal of Financial Economics*, 35, 2, 141-180.
4. Backus, D. K., S. Foresi, and S.E. Zin (1996). Arbitrage Opportunities in Arbitrage-Free Models of Option Pricing. *Journal of Business and Economic Statistics*, 16, 1, 1326.
5. Black, F., E. Dermand and W. Toy (1990). A One-Factor Model of Interest Rates and its Application to Treasury Bond Options. *Financial Analysts Journal*, 46, 333-339.
6. Black, F. and P. Karasinski (1991). Bond and Option Pricing when Short Rates are Lognormal. *Financial Analysts Journal*, 47, 525-529.
7. Black, F. and M. Scholes (1973). The Pricing of Options and Corporate Liabilities. *Journal of Political Economy*, 81, 3, 637-654.
8. Brennan, M.J. and E.S. Schwartz (1979). A Continuous Time Approach to the



- Pricing of Bonds. *Journal of Banking and Finance*, 3, 133155.
9. (1980). Analyzing Convertible Bonds. *Journal of Financial and Quantitative Analysis*, 15, 4, 907929.
10. Brown, S.J. and P.H. Dybvig (1986). The Empirical Implications of the Cox, Ingersoll, Ross Theory of the Term Structure of Interest Rates. *Journal of Finance*, 41, 3, 617632.
- 11. Brown, S.J. and S. M. Schaefer (1994). The Term Structure of Real Interest Rates and the Cox, Ingersoll and Ross Model. *Journal of Financial Economics*, 35, 1, 342.
12. Bühler, W., M. Uhrig, U. Walter and Th. Weber (1999). An Empirical Comparison of Forward-Rate and Spot-Rate Models for Valuing Interest Rate Options. *Journal of Finance*, 54, 1, 269-305.
13. Chan, K.C., G.A. Karolyi, F.A. Longstaff and A.B. Sanders (1992). An Empirical Comparison of Alternative Models of the Short-Term Interest Rate. *Journal of Finance*, 47, 3, 12091227.
14. Chen, L. (1996). *Interest Rate Dynamics, Derivatives Pricing, and Risk Management*. Springer-Verlag, Berlin.
15. Chen, R. and L. Scott (1992). Pricing Interest Rate Options in a Two-Factor Cox-Ingersoll-Ross Model of the Term Structure. *Review of Financial Studies*, 5, 4, 613636.
16. (1993). Maximum Likelihood Estimation for a Multifactor Equilibrium Model of the Term Structure of Interest Rates. *Journal of Fixed Income*, 3, 3, 1431.
17. (2003). Multi-Factor Cox-Ingersoll-Ross Models of the Term Structure: Estimates and Tests from a Kalman Filter Model. *Journal of Real Estate Finance and Economics*, 27, 2, 143172.
18. Constantinides, G.M. (1992). A Theory of the Nominal Term Structure of Interest Rates. *Review of Financial Studies*, 5, 4, 531552.
19. Cox, J.C. (1975). Notes on Option Pricing I: Constant Elasticity of Variance Diffusions. Working Paper. Stanford University.
- 20. Cox, J.C., J.E. Ingersoll and S.A. Ross (1980). An Analysis of Variable Rate Loan Contracts, *Journal of Finance*, 35, 2, 389403.
21. (1985a). An Intertemporal General Equilibrium Model of Asset Prices. *Econometrica*, 53, 2, 363384.
22. (1985b). A Theory of the Term Structure of Interest Rates. *Econometrica*, 53, 2, 385408.
23. Das, S. R. (1994a). Jump-Hunting Interest Rates. Working Paper. Stern School of Business. New York University.
24. (1994b). Jump-Diffusion Processes and the Bond Markets. Working Paper. Stern School of Business. New York University.
25. Das, S.R. and S. Foresi (1996). Exact Solution for Bond and Option Prices with Systematic Jump Risk. *Review of Derivatives Research*, 1, 724.
26. De Munnik, J.F.J. and P.C. Schotman (1994). Cross Sectional versus Time Series Estimation of Term Structure Models: Empirical Results for the Dutch Bond Market. *Journal of Banking and Finance*, 18, 5, 9971025.
27. Dothan, U.L. (1978). On the Term Structure of Interest Rates. *Journal of Financial Economics*, 6, 1, 5969.



- 28. Duan, J.C. and J.G. Simonato (1995). Estimating and Testing Exponential-Affine Term Structure Models by Kalman Filter. Working Paper, University of Montreal.
- 29. Duffie, D. and R. Kan (1996). A Yield-Factor Model of Interest Rates. *Mathematical Finance*, 6, 4, 379406.
- 30. Flesaker, B. (1993). Testing the Heath-Jarrow-Morton/Ho-Lee Model of Interest Rate Contingent Claims Pricing. *Journal of Financial and Quantitative Analysis*, 28, 4, 483495.
- 31. Geyer, A.L.J. and S. Pichler (1996). A State-space Approach to Estimate and Test Multi-Factor Cox-Ingersoll-Ross Models of the Term Structure, mimeo, Vienna University of Technology, forthcoming in 1999.
- 32. Gibbons, M.R. and K. Ramaswamy (1993). A Test of the Cox, Ingersoll and Ross Model of the Term Structure. *Review of Financial Studies*, 6, 3, 619658.
- 33. Heath, D., R. Jarrow and A. Morton (1992). Bond Pricing and the Term Structure of Interest Rates: A New Methodology for Contingent Claims Valuation *Econometrica*, 60, 1, 77105.
- 34. Heston, S.L. (1992). Testing Continuous Time Models of the Term Structure of Interest Rates. Working Paper, Yale University, New Haven.
- 35. (1993). A Closed-Form Solution for Options with Stochastic Volatility with Applications to Bond and Currency Options. *Review of Financial Studies*, 6, 2, 327343.
- 36. Ho, T.S.Y. and S. Lee (1986). Term Structure Movements and Pricing Interest Rate Contingent Claims. *Journal of Finance*, 41, 5, 10111029.
- 37. Hull, J. and A. White (1990a). Pricing Interest-Rate-Derivative Securities. *Review of Financial Studies*, 3, 4, 573592.
- 38. (1990b). Valuing Derivative Securities under the Explicit Finite Difference Method. *Journal of Financial and Quantitative Analysis*, 25, 1, 87100.
- 39. (1993). One-Factor Interest-Rate Models and the Valuation of Interest-Rate Derivative Securities. *Journal of Financial and Quantitative Analysis*, 28, 2, 235254.
- 40. Jamshidian, F. (1989). An Exact Bond Option Formula. *Journal of Finance*, 44, 1, 205209.
- 41. Knez, P.J., R. Litterman, R. and J. Scheinkman (1994). Explorations Into Factor Explaining Money Market Returns. *Journal of Finance*, 49, 5, 18611882.
- 42. Koedijk, K.G., F.G. Nissen, P.C. Schotman and C.C. Wolff (1997). The Dynamics of Short-Term Interest Rate Volatility Reconsidered. *European Finance Review*, 1, 105130.
- 43. Litterman, R. and J. Scheinkman (1991). Common Factors Affecting Bond Returns. *Journal of Fixed Income*, 1, 1, 5461.
- 44. Litterman, R., J. Scheinkman and L. Weiss (1991). Volatility and the Yield Curve. *Journal of Fixed Income*, 1, 1, 4953.
- 45. Longstaff, F.A. and E.S. Schwartz (1992). Interest Rate Volatility and The Term Structure: A Two-Factor General Equilibrium Model. *Journal of Finance*, 47, 4, 12591282.
- 46. Lund, J. (1994). Econometric Analysis of Continuous-Time Arbitrage-Free Models of the Term Structure of Interest Rates. Working Paper. The Aarhus School of Business, Denmark.



- 47. Merton, R.C. (1973a). Theory of Rational Option Pricing. *Bell Journal of Economics and Management Science*, 4, 1, 141183.
- 48. (1973b). An Intertemporal Capital Asset Pricing Model. *Econometrica*, 41, 5, 867887.
- 49. Moraleda, J.M. and T.C. Vorst (1996). An Empirical Comparison of Path-Independent Term Structure Models for Pricing Interest Rate Derivative Securities, mimeo, Erasmus University Rotterdam, The Netherlands.
- 50. Moreno, M. (2000). Modelizacín de la estructura temporal de los tipos de inters: valoracin de activos derivados y comportamiento emprico. *Revista Española de Financiacin y Contabilidad*, Vol. XXIX, n. 104, pp. 345-376.
- 51. (2002). On the Relevance of Modeling Volatility for Pricing Purposes. En Seminario de Matemática Financiera MEFF-UAM, Volume 2, editado por Instituto MEFF, ISBN 84-699-6766-5, Madrid.
- 52. (2003) A Two-Mean Reverting-Factor Model of the Term Structure of Interest Rates. *Journal of Futures Markets*, 23, 8, 1075-1105.
- 53. (2005). Presentación: instrumentos derivados. *Cuadernos Económicos de ICE*, Vol. 69, 5-10.
- 54. (2007). Managing Interest Rate Risk under Non-Parallel Changes: An Application of a Two-Factor Model. En *Advances in Risk Management*, editado por Greg Gregoriou, Palgrave-MacMillan, London, UK.
- 55. Moreno, M. and J.F. Navas (2003a). On the Robustness of Least-Squares Monte Carlo (LSM) for Pricing American Derivatives. *Review of Derivatives Research*, 6, 2, 107128.
- 56. (2003b). Métodos de valoración de opciones americanas: el enfoque Least-Squares Monte Carlo. En Seminario de Matemática Financiera MEFF-Risklab, Volumen 3, editado por Instituto MEFF, ISBN 84-688-2450-X, Madrid.
- 57. (2005). Valoración de activos derivados de renta fija bajo un modelo con dos factores correlacionados. *Cuadernos Económicos de ICE*, Vol. 69, 67-98.
- 58. Moreno, M. and J.I. Pena (1996). On the Term Structure of Interbank Interest Rates: Jump-Diffusion Processes and Option Pricing. En *Forecasting Financial Markets: Advances for Exchange Rates, Interest Rates and Asset Management*, ed. by Christian Dunis, John Wiley & Sons Ltd., Sussex, England.
- 59. Munk, C. (1999). Stochastic Duration and Fast Coupon Bond Option Pricing in Multi-Factor Models. *Review of Derivatives Research*, 3, 2, 157181.
- 60. Naik, V. and M. Lee (1990). General Equilibrium Pricing of Options on the Market Portfolio with Discontinuous Returns. *Review of Financial Studies*, 3, 4, 493521.
- 61. (1995). The Yield Curve and Bond Option Prices with Discrete Shifts in Economic Regimes, mimeo, University of British Columbia.
- 62. Navas, J.F. (1999). Consistent versus Non-Consistent Term Structure Models: Some Evidence from the Spanish Market. *Journal of Fixed Income*.
- 63. Pearson, N.D. and T.Sun (1994). Exploiting the Conditional Density in Estimating the Term Structure: An Application to the Cox, Ingersoll and Ross Model. *Journal of Finance*, 49, 4, 12791304.



- 64. Pelsser, A. (1997). A Tractable Yield-Curve Model that Guarantees Positive Interest Rates. *Review of Derivatives Research*, 1, 269284.
- 65. Richard, S.F. (1978). An Arbitrage Model of the Term Structure of Interest Rates. *Journal of Financial Economics*, 6, 1, 3357.
- 66. Schaefer, S.M. and E.S. Schwartz (1984). A Two-Factor Model of the Term Structure: An Approximate Analytical Solution. *Journal of Financial and Quantitative Analysis*, 19, 4, 413424.
- 67. Stapleton, R.C. and M.G. Subrahmanyam (1993). The Analysis and Valuation of Interest Rate Options. *Journal of Banking and Finance*, 17, 6, 10791095.
- 68. Sun, T. (1992). Real and Nominal Interest Rates: A Discrete-Time Model and its Continuous-Time Limit. *Review of Financial Studies*, 5, 4, 581611.
- 69. Sundaresan, S.M. (2000). Continuous-Time Methods in Finance: A Review and an Assessment. *Journal of Finance*, LV, 4, 15691622.
- 70. Turnbull, S.M. and F. Milne (1991). A Simple Approach to Interest-Rate Option Pricing. *Review of Financial Studies*, 4, 1, 87120.
- 71. Vasicek, O. (1977). An Equilibrium Characterization of the Term Structure. *Journal of Financial Economics*, 5, 2, 177188.
- 72. Wu, X. (2000). A New Stochastic Duration Measure Based on the Vasicek and CIR Term Structure Theories. *Journal of Business Finance and Accounting*, 27, 7 & 8, 911932.
- 73. Zhang, H. (1993). Treasury yield curves and cointegration. *Applied Economics*, 25, 3, 361367.

ADDENDA COVID-19

Aquesta addenda només s'activarà si la situació sanitària ho requereix i previ acord del Consell de Govern

En caso de tener que suspenderse la actividad presencial, el programa se reorganizará para poder continuar online con el desarrollo del Máster, manteniendo la calidad y el rigor tanto de las clases como de los métodos de evaluación. La Comisión Académica valorará la conveniencia de modificar la forma de evaluación de las asignaturas y cualquier posible cambio será anunciado al alumnado a la mayor brevedad posible.