**Warning:** [2026-02-26 14:42] this document is a print-out of the Ciência-iul web portal and was automatically generated at the labeled date. The document has a mere informational purpose and represents the information contained on Ciência_Iscte at that date.

# Jorge Miguel Bravo

**Associate Researcher**
BRU-Iscte - Business Research Unit

## Contacts

| | |
|---|---|
| **E-mail** | Jorge.Bravo@iscte-iul.pt |

## Research Interests

Finance; Risk Management; Portfolio Management; Longevity-Linked Securities & Derivatives; Data Science in Finance; Pension Finance/Economics

## Academic Qualifications

| University/Institution | Type | Degree | Period |
|---|---|---|---|
| Universidade de Évora | PhD | Economia | 2008 |
| Universidade de Évora Escola de Ciências Sociais | PhD | Economia | 2008 |
| Universidade de Lisboa | M.Sc. | MESTRADO ECONOMIA MONETÁRIA E FINANCEIRA | 2002 |
| Universidade de Évora Escola de Ciências Sociais | Licenciate | Economics | 1996 |

## Teaching Activities

| Teaching Year | Sem. | Course Name | Degree(s) | Coord. |
|---|---|---|---|---|
| 2024/2025 | 2º | Longevity-Linked Securities & Derivatives | Post Graduation Program in Financial Markets and Risk Management; | Yes |
| 2024/2025 | 1º | Fixed Income Securities | Post Graduation Program in Financial Markets and Risk Management; | Yes |
| 2022/2023 | 2º | Longevity-Linked Securities & Derivatives | Post Graduation Program in Financial Markets and Risk Management; | Yes |
| 2022/2023 | 1º | Fixed Income Securities | Post Graduation Program in Financial Markets and Risk Management; | Yes |
| 2020/2021 | 2º | Longevity-Linked Securities & Derivatives | Post Graduation Program in Financial Markets and Risk Management; | Yes |
| 2020/2021 | 1º | Fixed Income Securities | Post Graduation Program in Financial Markets and Risk Management; | Yes |

## Supervisions

### • Ph.D. Thesis

**- Concluded**

| | Student Name | Title/Topic | Language | Institution | Concluding Year |
|---|---|---|---|---|---|
| 1 | Richard Chamboko | Advanced survival modelling for consumer credit risk assessment: addressing recurrent events, multiple outcomes and frailty | English | Iscte | 2018 |
| 2 | Filipe Alexandre Aleman Ferreira Serrano | Gestão de Sistemas de Pensões em Contas Nacionais: Arquitectura e Gestão de Riscos | English | Iscte | 2011 |

### • M.Sc. Dissertations

**- Concluded**

| | Student Name | Title/Topic | Language | Institution | Concluding Year |
|---|---|---|---|---|---|
| 1 | Vítor Miguel Monteiro Marques | O microsseguro e a sua viabilidade de implementação em Portugal | English | Iscte | 2020 |
| 2 | Maria-Magdalena Magurean | Reverse mortgage: a neural network approach for pricing and risk assessment | English | Iscte | 2020 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Antonio Lorente Salmerón | The outsider´s method, an outlier detection system as lawyer of quality control tool at central balance sheet data office | English | Iscte | 2020 |
| 4 | Steffen Vering | Scaling credit decisions in FinTech : overcoming boundaries through behavioural credit risk models | English | Iscte | 2019 |
| 5 | Mohamed Hani AbdElHamid Mohamed Tawfik ElMasry | Machine learning approach for credit score analysis : a case study of predicting mortgage loan defaults | English | Iscte | 2019 |
| 6 | Larissa Patrícia Santos dos Reis | Projeção da mortalidade portuguesa por meio dos modelos generalizados de idade - período - coorte | English | Iscte | 2019 |
| 7 | Maria José dos Santos Gonçalves | Levantamentos programados na velhice : maximização da utilidade com retornos estocásticos | English | Iscte | 2019 |
| 8 | Rosalina Rato Cardoso Rosado | O incumprimento contributivo no Sistema de Segurança Social: Estudo do Impacto Financeiro e Social | English | Iscte | 2019 |
| 9 | Leila Filipa Galaio Ribeiro | Modelação e gestão do risco de longevidade através de longevity bonds | English | Iscte | 2019 |
| 10 | Catarina Alexandra Ferreira Martins | Produtos de desacumulação : o uso de life-care annuities em Portugal | English | Iscte | 2019 |
| 11 | Francisco André Coelho Ramos | The impact of the negative interest rate policy on bank´s profitability : the portuguese experience | English | Iscte | 2019 |
| 12 | José Eduardo Justo Neto | Modeling the impact of the volatility of the perceived counterparty credit risk on hedge accounting effectiveness | English | Iscte | 2019 |
| 13 | Cátia Alexandra Pires Contreiras | A gestão de ativos e passivos num Banco Central Nacional : duração e imunização do balanço | English | Iscte | 2018 |
| 14 | Teresa Carlota Guedes Machado Lemos de Figueiredo | Determinantes da propensão à poupança para a reforma em Portugal | English | Iscte | 2018 |
| 15 | Francisca da Câmara Machado Rodrigues de Castro | PROVISÃO PARA SINISTROS: ESTUDO DE UMA COMPANHIA DE SEGUROS ESPANHOLA | English | Iscte | 2018 |
| 16 | João Paulo Nogueira Santos | Credit risk modelling using multi-state markov models | English | Iscte | 2018 |
| 17 | André Luís Ferreira Serafim | Performance of VIX Straddle and Strangle strategies in Portfolio Management | English | Iscte | 2018 |
| 18 | Ines Bernardino Nunes Pereira | Multi-state modeling of retail credit risk : portuguese context | English | Iscte | 2018 |

| | | | | | |
|---|---|---|---|---|---|
| 19 | Sofia Alexandra Vieira dos Santos | Pricing Longevity Swaps-An empirical investigation using the risk-neutral simulation method | English | Iscte | 2018 |
| 20 | Filipa Isabel Gertrudes Rato | DETERMINAÇÃO DA PROBABILIDADE DE DEFAULT DE EMPRESAS PORTUGUESAS APLICANDO UM MODELO ESTRUTURAL | English | Iscte | 2018 |
| 21 | Ana Cristina Santos Gonçalves | Valuation of Reverse Mortgages - an empirical investigation using Portuguese Data | English | Iscte | 2018 |
| 22 | Lourenço Maria D´Almeida Tété Caçorino Dias | Modelo de Gestão da Informação para Análise da Concorrência Aplicação Prática no Setor Bancário | English | Iscte | 2018 |
| 23 | João Evaristo Manuel | Sustentabilidade Económica e Financeira da Segurança Social em Angola | English | Iscte | 2016 |
| 24 | Inês Regina Portela Costa Garcia | Previsão da Estrutura Temporal da Taxa de Juro na Zona Euro:aproximação paramétrica e por métodos de aprendizagem automática | English | Iscte | 2016 |
| 25 | Ana Rita Barroso de Figueiredo | Modelo Preditivo de insolvência no setor farmacêutico: aplicação à farmácia comunitária portuguesa | English | Iscte | 2015 |
| 26 | Rafael Filipe Duarte D Herbe Vidigal | O impacto nos requisitos de capital de uma seguradora através da implementação de uma nova politica de resseguro | English | Iscte | 2015 |
| 27 | Bruno Miguel Brito Borges | Exposição cambial e o efeito dos instrumentos financeiros de gestão e cobertura do risco cambial: Evidência empírica das empresas do PSI 20 | English | Iscte | 2014 |
| 28 | Carla Lopes Dias | Estratégia de heading dos riscos de mortalidade e taxa de juros em fundos de pensões e companhias de seguros | English | Iscte | 2013 |

## Total Citations

| | |
|---|---|
| **Web of Science®** | 774 |
| **Scopus** | 714 |

## Publications

- **Scientific Journals**
  - **Scientific journal paper**

| | |
|---|---|
| 1 | Maia, R. dos R. & Bravo, J. M. (2026). A new scale for evaluating disclosure in earnings calls on emerging markets. Emerging Science Journal. 10 (1), 247-275 |
| 2 | Bravo, J. M., Ayuso, M. & El Mekkaoui, N. (2025). Assessing the effectiveness of recent pension reforms: The French experiment. Socio-Economic Planning Sciences. 102<br>- Times Cited Google Scholar: 6 |
| 3 | Martins, J. N., Bravo, J. M. & Martins, J. M. (2024). Mapping the scientific landscape of knowledge management in IT SMEs: A bibliometric analysis. International Journal of Innovation and Technology Management. 21 (7) |
| 4 | Hovakimyan, G. & Bravo, J. M. (2024). Evolving strategies in machine learning: A systematic review of concept drift detection. Information. 15 (12)<br>- Times Cited Web of Science®: 6<br>- Times Cited Scopus: 7<br>- Times Cited Google Scholar: 14 |
| 5 | Clemente, C., Guerreiro, G. R. & Bravo, J. (2023). Modelling motor insurance claim frequency and severity using gradient boosting. Risks. 11 (9)<br>- Times Cited Web of Science®: 13<br>- Times Cited Scopus: 17<br>- Times Cited Google Scholar: 30 |
| 6 | Bravo, J. M., Ayuso, M., Holzmann, R. & Palmer, E. (2023). Intergenerational actuarial fairness when longevity increases: Amending the retirement age. Insurance: Mathematics and Economics. 113, 161-184<br>- Times Cited Web of Science®: 18<br>- Times Cited Scopus: 12<br>- Times Cited Google Scholar: 65 |
| 7 | Bravo, J. (2022). Pricing participating longevity-linked life annuities: a Bayesian Model Ensemble approach. European Actuarial Journal. 12 (1), 125-159<br>- Times Cited Web of Science®: 42<br>- Times Cited Scopus: 21<br>- Times Cited Google Scholar: 75 |
| 8 | Ashofteh, A., Bravo, J. & Ayuso, M. (2022). An ensemble learning strategy for panel time series forecasting of excess mortality during the COVID-19 pandemic. Applied Soft Computing. 128, 109422<br>- Times Cited Web of Science®: 19<br>- Times Cited Scopus: 16<br>- Times Cited Google Scholar: 19 |
| 9 | Culotta, F., Alaimo, L. S., Bravo, J., di Bella, E. & Gandullia, L. (2022). Total-employed longevity gap, pension fairness and public finance: Evidence from one of the oldest regions in EU. Socio-Economic Planning Sciences. 82<br>- Times Cited Web of Science®: 5<br>- Times Cited Scopus: 4<br>- Times Cited Google Scholar: 14 |
| 10 | Ashofteh, A. & Bravo, J. (2021). Data science training for official statistics: A new scientific paradigm of information and knowledge development in national statistical systems. Statistical Journal of the IAOS. 37 (3), 771-789<br>- Times Cited Web of Science®: 10<br>- Times Cited Scopus: 12<br>- Times Cited Google Scholar: 31 |

| | |
|---|---|
| 11 | Bravo, J., Ayuso, M., Holzmann, R. & Palmer, E. (2021). Addressing the life expectancy gap in pension policy. Insurance: Mathematics and Economics. 99, 200-221<br>- Times Cited Web of Science®: 62<br>- Times Cited Scopus: 47<br>- Times Cited Google Scholar: 133 |
| 12 | Ashofteh, A. & Bravo, J. (2021). A conservative approach for online credit scoring. Expert Systems with Applications. 176<br>- Times Cited Web of Science®: 47<br>- Times Cited Scopus: 55<br>- Times Cited Google Scholar: 103 |
| 13 | Bravo, J. & Ayuso, M. (2021). Linking pensions to life expectancy: Tackling conceptual uncertainty through bayesian model averaging. Mathematics. 9 (24)<br>- Times Cited Web of Science®: 14<br>- Times Cited Scopus: 12<br>- Times Cited Google Scholar: 28 |
| 14 | Ayuso, M., Bravo, J., Holzmann, R. & Palmer, E. (2021). Automatic indexation of the pension age to life expectancy: When policy design matters. Risks. 9 (5)<br>- Times Cited Web of Science®: 36<br>- Times Cited Scopus: 36<br>- Times Cited Google Scholar: 59 |
| 15 | Simões, C, Oliveira, L. & Bravo, J. M. (2021). Immunization strategies for funding multiple inflation-linked retirement income benefits. Risks. 9 (4)<br>- Times Cited Web of Science®: 17<br>- Times Cited Scopus: 14<br>- Times Cited Google Scholar: 30 |
| 16 | Bravo, J. M. & Nunes, J. (2021). Pricing longevity derivatives via Fourier transforms. Insurance: Mathematics and Economics. 96, 81-97<br>- Times Cited Web of Science®: 40<br>- Times Cited Scopus: 26<br>- Times Cited Google Scholar: 63 |
| 17 | Ayuso, M., Bravo, J. & Holzmann, R. (2021). Getting life expectancy estimates right for pension policy: period versus cohort approach. Journal of Pension Economics and Finance. 20 (2), 212-231<br>- Times Cited Web of Science®: 58<br>- Times Cited Scopus: 54<br>- Times Cited Google Scholar: 141 |
| 18 | Bravo, J. & Jose A. Herce (2020). Career breaks, broken pensions? Long-run effects of early and late-career unemployment spells on pension entitlements. Journal of Pension Economics and Finance. 21 (2), 191-217<br>- Times Cited Web of Science®: 42<br>- Times Cited Scopus: 33<br>- Times Cited Google Scholar: 93 |
| 19 | Bravo, J. & Edviges Coelho (2020). Short-term regional demographic forecasts with time series methods and machine learning algorithms. Boletim da Sociedade Portuguesa de Estatística. Primavera , 20-29 |
| 20 | Bravo, J. & Ayuso, M. (2020). Previsões de mortalidade e de esperança de vida mediante combinação Bayesiana de modelos: Uma aplicação à população portuguesa. RISTI - Revista Ibérica de Sistemas e Tecnologias de Informação/Iberian Journal of Information Systems and Technologies (RISTI). 40, 128-144<br>- Times Cited Web of Science®: 31<br>- Times Cited Scopus: 21<br>- Times Cited Google Scholar: 19 |

| | |
|---|---|
| 21 | Ashofteh, A. & Bravo, J. (2020). A study on the quality of novel coronavirus (COVID-19) official datasets. Statistical Journal of the IAOS. 36 (2), 291-301<br>- Times Cited Web of Science®: 25<br>- Times Cited Scopus: 32<br>- Times Cited Google Scholar: 51 |
| 22 | Chamboko, R. & Bravo, J. (2020). A multi-state approach to modelling intermediate events and multiple mortgage loan outcomes. Risks. 8 (2), 1-29<br>- Times Cited Web of Science®: 20<br>- Times Cited Scopus: 14<br>- Times Cited Google Scholar: 43 |
| 23 | Richard Chamboko & Bravo, J. M. (2019). Frailty correlated default on retail consumer loans in Zimbabwe. International Journal of Applied Decision Sciences. 12 (3), 257<br>- Times Cited Web of Science®: 21<br>- Times Cited Scopus: 16<br>- Times Cited Google Scholar: 40 |
| 24 | Bravo, Jorge Miguel, NOVA Information Management School (NOVA IMS) & Bravo, J. (2019). Funding for longer lives. Ekonomiaz. 96 (2), 268-291<br>- Times Cited Scopus: 22 |
| 25 | Richard Chamboko & Bravo, J. (2019). Modelling and forecasting recurrent recovery events on consumer loans. International Journal of Applied Decision Sciences. 12 (3), 271<br>- Times Cited Scopus: 16<br>- Times Cited Google Scholar: 41 |
| 26 | Sara Ribeiro, Pedro Cabral, Henriques, R., Bravo, J., Teresa Rodrigues & Painho, M. (2018). Modelação do crescimento urbano para a distribuição eficaz das forças de segurança. Proelium. 7 (14), 45-68 |
| 27 | Bravo, J. & Najat El Mekkaoui de Freitas (2018). Valuation of longevity-linked life annuities. Insurance: Mathematics and Economics. 78, 212-229<br>- Times Cited Web of Science®: 66<br>- Times Cited Scopus: 42<br>- Times Cited Google Scholar: 108 |
| 28 | Bravo, J. (2016). Taxation of pensions in portugal: A semi-dual income tax system. CESifo DICE Report. 14 (1), 14-23<br>- Times Cited Scopus: 18<br>- Times Cited Google Scholar: 47 |
| 29 | Richard Chamboko & Bravo, J. (2016). On the modelling of prognosis from delinquency to normal performance on retail consumer loans. Risk Management. 18 (4), 264-287<br>- Times Cited Web of Science®: 38<br>- Times Cited Scopus: 24<br>- Times Cited Google Scholar: 66 |
| 30 | Bravo, J. & Silva, Carlos Manuel Pereira da (2006). Immunization using a stochastic-process independent multi-factor model: The Portuguese experience. Journal of Banking & Finance. 30 (1), 133-156<br>- Times Cited Web of Science®: 36<br>- Times Cited Scopus: 27<br>- Times Cited Google Scholar: 81 |

## • Books and Book Chapters

**- Book author**

| | |
|---|---|
| 1 | Bravo, J. M., Nuno Monteiro Amaro & Jorge Campino (2024). Segurança Social: Direito e Economia. Coimbra. Almedina. |
| 2 | Cerejeira, J., Margarida Corrêa De Aguiar, Alfredo Marvão Pereira, Ana João Sepúlveda, Silva, Carlos Manuel Pereira da, Fernando Ribeiro Mendes...et al (2020). Cidadania Social e Economia. UMinho Editora. |

**- Book chapter**

| | |
|---|---|
| 1 | Bravo, J. M. (2026). Pricing e-forwards: An Investigation Using Bayesian Model Ensembles and Stacking Regression. In Rocha et al. (Ed.), Proceedings of 19th Iberian Conference on Information Systems and Technologies (CISTI 2024). CISTI 2024. Lecture Notes in Networks and Systems, vol 1751. Springer, Cham. (pp. 413-427). Berlin: Springer. |
| 2 | Baggi Alvarez, R. & Bravo, J. M. (2026). Forecast Combination for Asset Classes ETFs: Insights on Market Efficiency and Arbitrage. In Rocha, A., García Peñalvo, F., Costa, C.J., Gonçalves, R. (Ed.), Proceedings of 20th Iberian Conference on Information Systems and Technologies (CISTI 2025). Lecture Notes in Networks and Systems. (pp. 274-286).: Springer, Cham. |
| 3 | Bravo, J. M. (2025). Ensemble Methods for Stock Market Prediction. In Rosa Meo · Fabrizio Silvestri (Ed.), Machine Learning and Principles and Practice of Knowledge Discovery in Databases. ECML PKDD 2023. Communications in Computer and Information Science. (pp. 430-448).: Springer Cham.<br>- Times Cited Scopus: 1<br>- Times Cited Google Scholar: 6 |
| 4 | Mercedes Ayuso, Manuel Pérez-Martí & Bravo, J. M. (2025). Couples' Joint Life Expectancy at Retirement Ages: Evidence from Spain. In Demographic Transitions, Health, and Well-Being. (pp. 121-131).: Springer. |
| 5 | Bernardo Raimundo & Bravo, J. M. (2024). Credit Risk Scoring: A Stacking Generalization Approach. In World Conference on Information Systems and Technologies WorldCIST 2023: Information Systems and Technologies. (pp. 382-396).: Springer.<br>- Times Cited Web of Science®: 4<br>- Times Cited Scopus: 3<br>- Times Cited Google Scholar: 9 |
| 6 | Mercedes Ayuso & Bravo, J. (2022). Indexing pensions to life expectancy: Keeping the system fair across generations. In Marco Corazza and Cira Perna and Claudio Pizzi and Marilena Sibillo (Ed.), Mathematical and Statistical Methods for Actuarial Sciences and Finance. (pp. 31-37).: Springer International Publishing.<br>- Times Cited Web of Science®: 2<br>- Times Cited Scopus: 2<br>- Times Cited Google Scholar: 8 |
| 7 | Bravo, J. & Vitor Santos (2022). Backtesting Recurrent Neural Networks with Gated Recurrent Unit: Probing with Chilean Mortality Data. In Advances and Applications in Computer Science, Electronics, and Industrial Engineering. CSEI 2021.<br>- Times Cited Scopus: 5<br>- Times Cited Google Scholar: 18 |
| 8 | Bravo, J. & Najat El Mekkaoui de Freitas (2022). Short-Term CPI Inflation Forecasting: Probing with Model Combinations. In Information Systems and Technologies. WorldCIST 2022.<br>- Times Cited Web of Science®: 8<br>- Times Cited Scopus: 5<br>- Times Cited Google Scholar: 15 |

| | |
|---|---|
| 9 | Luzolo João Manuel & Bravo, J. (2021). AVALIAÇÃO DO GRAU DE MATURIDADE DO SISTEMA DE CONTROLO INTERNO BANCÁRIO EM ANGOLA SEGUNDO A METODOLOGIA COSO. In Administração, Finanças e Geração de Valor. (pp. 59-79).: Atena. |
| 10 | Bravo, J. (2021). The Demographics of Defense and Security in Japan. In Developments and Advances in Defense and Security: Proceedings of MICRADS 2021. (pp. 359-370).: Springer.<br>- Times Cited Scopus: 1<br>- Times Cited Google Scholar: 5 |
| 11 | Bravo, J. & Ayuso, M. (2021). Forecasting the Retirement Age: A Bayesian Model Ensemble Approach. In Trends and Applications in Information Systems and Technologies. WorldCIST 2021. Advances in Intelligent Systems and Computing.<br>- Times Cited Web of Science®: 28<br>- Times Cited Scopus: 19<br>- Times Cited Google Scholar: 37 |
| 12 | Bravo, J. (2021). IDD and Distribution Risk Management. In Insurance Distribution Directive. AIDA Europe Research Series on Insurance Law and Regulation. (pp. 349-369).: Springer.<br>- Times Cited Scopus: 5<br>- Times Cited Google Scholar: 17 |
| 13 | Bravo, J. (2021). Forecasting Longevity for Financial Applications: A First Experiment with Deep Learning Methods. In Machine Learning and Principles and Practice of Knowledge Discovery in Databases.: Springer.<br>- Times Cited Web of Science®: 11<br>- Times Cited Scopus: 7<br>- Times Cited Google Scholar: 21 |
| 14 | Bravo, J. (2021). A fecundidade como indicador avançado dos ciclos económicos em Portugal. In Instituto Nacional de Estatística - Inquérito à Fecundidade: 2019. (pp. 121-149).: INE - Instituto Nacional de Estat{\'i. |
| 15 | Bravo, J. & Edviges Coelho (2020). Modelling Monthly Births and Deaths Using Seasonal Forecasting Methods as an Input for Population Estimates. In Demography of Population Health, Aging and Health Expenditures. (pp. 203-222).: Springer Science+Business Media B.V.<br>- Times Cited Scopus: 5<br>- Times Cited Google Scholar: 9 |
| 16 | Marques, Vitor Miguel Monteiro, Bravo, Jorge Miguel, NOVA Information Management School (NOVA IMS), Vitor Miguel Monteiro Marques & Bravo, J. (2020). Análise da viabilidade do microsseguro em Portugal. In Oliveira, {Thaislayne Nunes de (Ed.), A Política Social e Gestão de Serviços Sociais 2. (pp. 170-183).: Atena. |
| 17 | Bravo, J., Bravo, Jorge Miguel Ventura & NOVA Information Management School (NOVA IMS) (2020). Reforma do sistema de pensões e consistência intertemporal da protecção social. In Pavan, {Lucca Simeoni (Ed.), A Economia numa Perspectiva Interdisciplinar. (pp. 75-91).: Atena Editora.<br>- Times Cited Google Scholar: 8 |
| 18 | Bravo, Jorge Miguel, NOVA Information Management School (NOVA IMS) & Bravo, J. (2020). Addressing the Pension Decumulation Phase of Employee Retirement Planning. In Ingrid Muenstermann (Ed.), Who Wants to Retire and Who Can Afford to Retire?. (pp. 1-21).: IntechOpen.<br>- Times Cited Google Scholar: 7 |
| 19 | Bravo, Jorge Miguel, Coelho, Edviges Isabel Felizardo, NOVA Information Management School (NOVA IMS), Bravo, J. & Edviges Isabel Felizardo Coelho (2020). Forecasting small population monthly fertility and mortality data with seasonal time series methods. In Linhares, {Wendell Luiz (Ed.), As Ciências Sociais Aplicadas e a Interface com vários Saberes 2. (pp. 158-176).: Atena. |

| | |
|---|---|
| 20 | Bravo, J. (2018). Taxation of Pensions in Portugal. In Holzmann, { Robert (Ed.), Is there a Rationale for a Semi-Dual Income Tax System?. (pp. 135-166).: The MIT Press. |
| 21 | Bravo, J., Teresa Rodrigues, Sara Ribeiro & André Inácio (2018). Portugal. In Teresa Rodrigues and Painho, {Marco (Ed.), projeções de população residente 2011-2040. (pp. 169-208).: Fronteira do Caos.<br>- Times Cited Google Scholar: 6 |
| 22 | Bravo, J. (2017). Contratos intergeracionais e consistência temporal na gestão da protecção social. In Ferreira, {Pedro Moura (Ed.), implicações políticas e reforma do sistema de pensões. (pp. 61-96).: ICS-Imprensa de Ci{\^e. |
| 23 | Bravo, J. & Jiménez. J. D. (2015). ¿La longevidad es un riesgo asegurable? Cubriendo lo incubrible?. In ¿Es posible planificar la jubilación?, Dos años del Instituto BBVA de Pensiones en España. (pp. 205-240).: Instituto BBVA de Pensiones.<br>- Times Cited Google Scholar: 6 |
| 24 | Bravo, J. (2015). Living longer and prospering? Opções de redesenho dos sistemas de pensões em Portugal (2014). In {Neto Paulo e Serrano (Ed.), Políticas Públicas, Economia e Sociedade. Contributos para a Definição de Políticas no Período 2014-2020. (pp. 139-168).: Nexo Literário. |
| 25 | Bravo, J. & Jose A. Herce (2015). Las pensiones en España y Portugal: Descripción de los esquemas y evolución reciente comparada. In ¿Es posible planificar la jubilación? Dos años del Instituto BBVA de Pensiones en España. (pp. 89-126).: Instituto BBVA de Pensiones.<br>- Times Cited Google Scholar: 10 |
| 26 | Bravo, J., Magalhães, Maria Graça & Edviges Coelho (2014). Dinâmica e Estrutura da População Humana: Medidas e Modelos Matemáticos. In Matemática do Planeta Terra. (pp. 503-541).: IST Press. |
| 27 | Bravo, J., Alho, Juha & Edward Palmer (2013). Annuities and Life Expectancy in NDC. In Nonfinancial Defined Contribution Pension Schemes in a Changing Pension World: Gender, Politics, and Financial Stability, Volume 2, . (pp. 395-436).: International Bank for Reconstruction and Development / The World Bank.<br>- Times Cited Google Scholar: 65 |
| 28 | Bravo, J. (2013). Comment on the Egypt's New Social Insurance System: An NDC Reform in an Emerging Economy. In Nonfinancial Defined Contribution Pension Schemes in a Changing Pension World: Vol.1, Progress, Lessons, and Implementation.: International Bank for Reconstruction and Development / The World Bank. |
| 29 | Bravo, J. (2012). Lee-Carter mortality projection with «Limit Life Table». In EUROSTAT - European Commission (eds.), Work Session on Demographic Projections, EUROSTAT-EC Collection: Methodologies and Working Papers, Theme: Population and Social Conditions.: EUROSTAT - European Commission.<br>- Times Cited Google Scholar: 7 |
| 30 | Bravo, J. (2012). Parametric interest rate risk immunization. In New developments in banking and finance. (pp. 35-64).: Nova Science Publishers, Inc, New York.<br>- Times Cited Google Scholar: 7 |
| 31 | Bravo, J. & Braumann, Carlos A. (2008). The value of a random life: modelling survival probabilities in a stochastic environment. In Bulleting of the 56th Session of the International Statistical Institute. (pp. 5743-5746).: International Statistical Institute.<br>- Times Cited Google Scholar: 9 |

## • Conferences/Workshops and Talks

**- Publication in conference proceedings**

| | |
|---|---|
| 1 | Bravo, J. M. & Gonçalves, J. (2025). Financing long-term care in Portugal: Is there a role for home equity release schemes?. In Pedro Miguel Gaspar, David Facal, Esperanza Navarro-Pardo, Veland Ramadani (Ed.), Demographic transitions, health, and well-being: International Conference on Demographic Transition, Health, and Technologies 2025 (ICDTHT25), Conference proceedings. (pp. 107-120). Ecuador: Springer.<br>- Times Cited Google Scholar: 1 |
| 2 | Baggi Alvarez, R. & Bravo, J. M. (2025). Forecast Combination for Asset Classes: Insights on Market Efficiency and Arbitrage. In CISTI'2025 - 20th Iberian Conference on Information Systems and Technologies. |
| 3 | Baggi Alvarez, R., Curto, J. & Bravo, J. M. (2025). Volatility of Interest Rates in the U.S. After Covid-19: A Multivariate GARCH Analysis. In 9th International Conference on Advanced Research in Business, Management and Economics (ICABME). |
| 4 | Bravo, J. M. & Afshin Ashofteh (2023). Ensemble Methods for Consumer Price Inflation Forecasting. In Atas da 23ª Conferência da Associação Portuguesa de Sistemas de Informação.: Associação Portuguesa de Sistemas de Informação, APSI.<br>- Times Cited Scopus: 1<br>- Times Cited Google Scholar: 5 |
| 5 | Carina Clemente, Gracinda R. Guerreiro & Bravo, J. M. (2023). Gradient Boosting in Motor Insurance Claim Frequency Modelling. In Atas da 23ª Conferência da Associação Portuguesa de Sistemas de Informação.: Associação Portuguesa de Sistemas de Informação, APSI.<br>- Times Cited Google Scholar: 3 |
| 6 | Cunha, L. & Bravo, J. (2022). Automobile usage-based-insurance: Improving risk management using telematics data. In Rocha, A., Bordel, B., Peñalvo, F. G., & Gonçalves, R. (Ed.), 2022 17th Iberian Conference on Information Systems and Technologies (CISTI). (pp. 1-6). United States: IEEE Computer Society.<br>- Times Cited Scopus: 6<br>- Times Cited Google Scholar: 11 |
| 7 | Afshin Ashofteh, Bravo, J. & Mercedes Ayuso (2021). A Novel Layered Learning Approach for Forecasting Respiratory Disease Excess Mortality during the COVID-19 pandemic. In CAPSI 2021 Proceedings. (pp. 1-18).: Associação Portuguesa de Sistemas de Informação .<br>- Times Cited Google Scholar: 9 |
| 8 | Najat El Mekkaoui de Freitas & Bravo, J. (2021). Drawing Down Retirement Financial Savings: A Welfare Analysis using French data. In 2021 The 5th International Conference on E-Commerce, E-Business and E-Government (ICEEG '21). (pp. 152-158). United States: Association for Computing Machinery (ACM).<br>- Times Cited Web of Science®: 6<br>- Times Cited Scopus: 5<br>- Times Cited Google Scholar: 7 |
| 9 | Bravo, J. (2021). Pricing Survivor Bonds with Affine-Jump Diffusion Stochastic Mortality Models. In 2021 The 5th International Conference on E-Commerce, E-Business and E-Government ICEEG '21. (pp. 91-96). United States: Association for Computing Machinery (ACM).<br>- Times Cited Web of Science®: 12<br>- Times Cited Scopus: 6<br>- Times Cited Google Scholar: 18 |
| 10 | Afshin Ashofteh & Bravo, J. (2021). Life Table Forecasting in COVID-19 Times - An Ensemble Learning Approach. In Alvaro Rocha and Ramiro Gon{\c c (Ed.), Proceedings of CISTI 2021 - 16th Iberian Conference on Information Systems and Technologies . (pp. 1-6).: IEEE Computer Society Press.<br>- Times Cited Web of Science®: 3<br>- Times Cited Scopus: 11<br>- Times Cited Google Scholar: 25 |

| | |
|---|---|
| 11 | Bravo, J. (2021). Forecasting mortality rates with Recurrent Neural Networks - A preliminary investigation using Portuguese data. In CAPSI 2021 Proceedings (Atas da 21ª Conferência da Associação Portuguesa de Sistemas de Informação 2021). (pp. 1-19).: Associação Portuguesa de Sistemas de Informação .<br>- Times Cited Google Scholar: 22 |
| 12 | Bravo, J. (2020). Longevity-Linked Life Annuities: A Bayesian Model Ensemble Pricing Approach. In CAPSI 2020 Proceedings.: Associação Portuguesa de Sistemas de Informação.<br>- Times Cited Scopus: 16<br>- Times Cited Google Scholar: 35 |
| 13 | Bravo, J. & Edviges Coelho (2019). Forecasting subnational demographic data using seasonal time series methods. In Atas da Conferencia da Associacao Portuguesa de Sistemas de Informacao 2019.: Associação Portuguesa de Sistemas de Informação.<br>- Times Cited Scopus: 12<br>- Times Cited Google Scholar: 19 |
| 14 | Bravo, J. & Edviges Coelho (2019). Forecasting Subnational Monthly Births and Deaths using Seasonal Time Series Methods. In Evidence-based territorial policymaking: formulation, implementation and evaluation of policy. (pp. 1079-1088). Portugal: Associacao Portuguesa para o Desenvolvimento Regional (APDR). |
| 15 | Afshin Ashofteh & Bravo, J. (2019). A non-parametric-based computationally efficient approach for credit scoring using non-traditional data. In Karl Moder and Bernhard Spange (Ed.), 8th International Conference on Risk Analysis and Design of Experiments. (pp. 9-9). |
| 16 | Afshin Ashofteh & Bravo, J. (2019). A non-parametric-based computationally efficient approach for credit scoring. In Proceedings of the 19th Portuguese Association of Information Systems Conference. (pp. 19-19).: Associação Portuguesa de Sistemas de Informação.<br>- Times Cited Google Scholar: 23 |
| 17 | Bravo, J. & Edviges Coelho (2019). Modelling monthly birth and deaths using Seasonal Forecasting Methods as an input for population estimates. In 19th Conference of the Applied Stochastic Models and Data Analysis International Society (ASMDA2019) and Demographics 2019 Workshop. (pp. 263-279).<br>- Times Cited Google Scholar: 9 |
| 18 | Afshin Ashofteh & Bravo, J. (2019). A non-parametric-based computationally efficient approach for credit scoring. In Atas da Conferencia da Associacao Portuguesa de Sistemas de Informacao 2019. (pp. 19-19).: Associação Portuguesa de Sistemas de Informação.<br>- Times Cited Google Scholar: 22 |
| 19 | Bravo, J. & Edviges Coelho (2019). Modelling monthly births and deaths using Seasonal Forecasting Methods as an input for population estimates. In Skiadas, Christos H. (Ed.), Proceedings of 18th Applied Stochastic Models and Data Analysis International Conference with the Demographics 2019 Workshop Florence, Italy. (pp. 263-279).: ISAST: International Society for the Advancement of Science and Technology.<br>- Times Cited Google Scholar: 9 |
| 20 | Bravo, J. & Edviges Coelho (2019). Forecasting subnational demographic data using seasonal time series methods. In Proceedings of the 19th Portuguese Association of Information Systems Conference. (pp. 40-40).: Associação Portuguesa de Sistemas de Informação.<br>- Times Cited Google Scholar: 19 |

**- Conference paper not in proceedings**

| | |
|---|---|
| 1 | Baggi Alvarez, R., Curto, J. & Bravo, J. M. (2025). Volatility of Interest Rates in the U.S. After Covid-19: A Multivariate GARCH Analysis. 14th International Conference of the Financial Engineering and Banking Society |

| | |
|---|---|
| | (FEBS). |

## • Other Publications

**- Working Papers**

| | |
|---|---|
| 1 | Bravo, J., Mercedes Ayuso, Jose A. Herce, Edward Palmer & Rafael Dómenech (2023). Automatic Adjustment Mechanisms In Pension Systems. |
| 2 | Bravo, J., Mercedes Ayuso, Robert Holzmann & Edward Palmer (2021). Intergenerational Actuarial Fairness When Longevity Increases: Amending the Retirement Age. |
| 3 | Mercedes Ayuso, Bravo, J. & Robert Holzmann (2019). Revisión del ahorro y el desahorro en el ciclo de vida entre las tres capas de grupos de ingresos. |
| 4 | Mercedes Ayuso, Bravo, J. & Robert Holzmann (2019). Hacer uso de la garantía hipotecaria. |
| 5 | Robert Holzmann, Mercedes Ayuso, Estefanía Alaminos & Bravo, J. (2019). Life Cycle Saving and Dissaving Revisited across Three-tiered Income Groups.<br>- Times Cited Google Scholar: 1 |
| 6 | Robert Holzmann, Mercedes Ayuso & Bravo, J. (2019). Making use of Home Equity.<br>- Times Cited Scopus: 6 |
| 7 | Mercedes Ayuso, Bravo, J. & Robert Holzmann (2018). Getting Life Expectancy Estimates Right for Pension Policy. |
| 8 | Bravo, J. & Jose A. Herce (2017). On the Influence of Employment-Breaks on Pension Benefits.<br>- Times Cited Google Scholar: 2 |
| 9 | Teresa Rodrigues, Bravo, J., André Inácio, Sara Ribeiro, Rodrigues, Teresa, Bravo, Jorge Miguel...et al (2017). Portugal. Projeções de População Residente a Nível Concelhio, 2011- 2014. |
| 10 | Mercedes Ayuso, Bravo, J. & Robert Holzmann (2015). Revisión de los supuestos de proyección referentes a los condicionantes demográficos de la organización internacional, de los institutos nacionales y de la documentación académica. |
| 11 | Bravo, J., Javier Díaz-Giménez, Bravo, Jorge Miguel, Díaz-Giménez, Javier & NOVA Information Management School (NOVA IMS) (2014). Is longevity an insurable risk?. |
| 12 | Bravo, J. & Silva, Carlos Manuel Pereira da (2013). Immunization Using a Parametric Model of the Term Structure.<br>- Times Cited Google Scholar: 2 |
| 13 | Silva, Carlos Manuel Pereira da, Corte Real, Pedro, Bravo, J. & Vaz-Paralta, Sara Sofia (2006). The paradox of ageing. |
| 14 | Bravo, J. & Silva, Carlos Manuel Pereira da (2005). Immunization Using a Parametric Model of the Term Structure. |

**- Non-peer-reviewed papers**

| | |
|---|---|
| 1 | Mercedes Ayuso & Bravo, J. (2021). El necesario enfoque actuarial de los sistemas de pensiones. Mediterráneo Económico. 34, 97-112 |
| 2 | Bravo, J. (2021). Em defesa de um sistema de pensões sustentável e intergeracionalmente justo para Portugal. Cadernos de Economia. 136, 38-43 |
| 3 | Bravo, J. (2019). Impactos macroeconómicos do envelhecimento da população. Cadernos de Economia. 32 (127), 50-52 |
| 4 | Sara Ribeiro, Pedro Cabral, Henriques, R., Bravo, J., Teresa Rodrigues & Painho, M. (2018). Modelação do Crescimento Urbano Para a Distribuição Eficaz das Forças de Segurança. O Caso português.<br>- Times Cited Google Scholar: 7 |
| 5 | Mercedes Ayuso, Bravo, J. & Robert Holzmann (2017). On the Heterogeneity in Longe vity among Socioeconomic Groups. Global Journal of Human Social Science Research. 17 (1), 33-58 |
| 6 | Mercedes Ayuso, Bravo, J. & Robert Holzmann (2017). Addressing Longevity' Heterogeneity in Pension Scheme Design. Journal of Finance and Economics. 6 (1), 1-21<br>- Times Cited Web of Science®: 34 |
| 7 | Bravo, J. (2016). Taxation of Pensions in Portugal: A Semi-Dual Income Tax System. CESifo DICE Report - Journal for Institutional Comparisons. |
| 8 | Bravo, J. (2015). Por uma Protecção Social mais justa e partilhada. Cadernos de Economia. 112 (Julho-Sete), 29-33 |
| 9 | Bravo, J. (2014). (In)Sustentabilidade Financeira dos Sistemas Públicos de Segurança Social em Portugal: Previsões de Longo Prazo e Arquitectura de um novo Contrato Social entre Gerações.<br>- Times Cited Google Scholar: 1 |
| 10 | Bravo, J. (2013). Pricing Longevity Bonds Using Affine-Jump Diffusion Models.<br>- Times Cited Google Scholar: 20 |
| 11 | Bravo, J. & Fonseca, José (2013). Parametric Immunization in Bond Portfolio Management.<br>- Times Cited Google Scholar: 5 |
| 12 | Bravo, J. & Corte Real, Pedro (2013). Modeling Longevity Risk using Extreme Value Theory: An Empirical Investigation using Portuguese and Spanish Population Data.<br>- Times Cited Google Scholar: 8 |
| 13 | Bravo, J. (2013). Segure a sua pensão: Soluções de financiamento da reforma e de gestão do risco de longevidade. |
| 14 | Bravo, J., Edviges Coelho & Magalhães, Maria Graça (2013). Mortality and Longevity Projections for the Oldest-Old in Portugal.<br>- Times Cited Google Scholar: 22 |
| 15 | Bravo, J. (2013). Modelling Mortality using Multiple Stochastic Latent Factors.<br>- Times Cited Google Scholar: 6 |
| 16 | Bravo, J., Corte Real, Pedro & Silva, Carlos Manuel Pereira da (2012). Participating life annuities incorporating longevity risk sharing arrangements.<br>- Times Cited Google Scholar: 18 |

**- Other publications**

| | |
|---|---|
| 1 | Mercedes Ayuso & Bravo, J. (2022). A desigualdade oculta por detrás do aumento da esperança de vida. a importância de vigiar a disparidade na duração da vida. |
| 2 | Mercedes Ayuso, Bravo, J., Elsa Chuliá, Jose A. Herce, Edward Palmer, Rafael Dómenech...Javier Alonso (2020). Decálogo de preguntas y respuestas sobre el impacto previsional del COVID-19. |
| 3 | Mercedes Ayuso & Bravo, J. (2020). Idosos e longevidade em Espanha e Portugal. indicadores demográficos básicos a ter em conta nas políticas de pensões. |
| 4 | Bravo, J. & Braumann, Carlos A. (2008). Abstract ISI 2007 Bravo+Braumann. Scientific meeting: 56th Session of the International Statistical Institute, Lisboa Portugal, Aug 22-29, 2007. Oral communication on stochastic differential equation models for the evolution of mortality rates of human populations and applications to life insurance. |
| 5 | Bravo, J. & Braumann, Carlos A. (2007). Abstract ISI 2007 Bravo+Braumann. Scientific meeting: 56th Session of the International Statistical Institute, Lisboa Portugal, Aug 22-29, 2007. Oral communication on stochastic differential equation models for the evolution of mortality rates of human populations and applications to life insurance. |

**- Master's Dissertation**

| | |
|---|---|
| 1 | Bravo, J. (2001). Modelos de risco de taxa de juro : estratégias de cobertura e imunização.<br>- Times Cited Google Scholar: 4 |

**- Doctoral Thesis**

| | |
|---|---|
| 1 | Bravo, Jorge Miguel (2008). Tábuas de mortalidade contemporâneas e prospectivas: modelos estocásticos, aplicações actuariais e cobertura do risco de longevidade.<br>- Times Cited Google Scholar: 58 |
| 2 | Bravo, J. (2007). Tábuas de mortalidade contemporâneas e prospectivas: modelos estocásticos, aplicações actuariais e cobertura do risco de longevidade. |

**- Report**

| | |
|---|---|
| 1 | Silva, Carlos Manuel Pereira da, Bravo, J. & Gonçalves, João Manuel (2021). Impacto económico e social da sinistralidade rodoviária em Portugal.<br>- Times Cited Google Scholar: 13 |
| 2 | Mercedes Ayuso, Edward Palmer & Bravo, J. (2021). Edad de jubilación y vinculación a la esperanza de vida. |
| 3 | Bravo, J., Mercedes Ayuso & Edward Palmer (2020). El gap entre esperanzas de vida. |
| 4 | Mercedes Ayuso & Bravo, J. (2020). COVID-19. |

## Awards

| |
|---|
| Best Paper Award MIDAS 2023 Workshop - Paper Title "Ensemble methods for Stock Market Prediction" (2023) |
| Risks Journal Best Published Paper Award 2022. Automatic Indexation of the Pension Age to Life Expectancy: When Policy Design Matters. Risks 2021, 9(5), 96; doi: org/10.3390/risks905009 (2023) |
| Prémio Inovação Reforma - Programa Consciência Leve CGD (Menção honrosa, 2º lugar) (2009) |
| PhD merit scholarship (2004) |
| Best MSc Student Prize Companhia Europeia de Seguros (2002) |
| Best Economics Student of the Year (1996) |
| Degree merit scholarship (1996) |
| Degree merit scholarship (1992) |