CURRICULUM VITAE

**Astrid Loretta Ayala Castellanos**

**CONTACT INFORMATION**

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3001 Mercer University Drive, Atlanta, GA 30341

Citizenship: Guatemalan

**EMPLOYMENT**

2023 – present Stetson-Hatcher School of Business and Economics, **Mercer University**, United States

* Associate Professor of Management Science and Analytics.

2006 – 2023 School of Business, **Francisco Marroquin University**, Guatemala and Panama

* Professor of Economics
* Director of the Legal Master (LL.M.) in Finance program
* Director of the Guatemalan Econometric Study Group (GESG).

**STUDIES**

**PhD in Economics**, University of Navarra, Pamplona, Spain

* Thesis title: *Three Essays on Real and Nominal Macroeconomic Variables in Latin America*
* Supervisors: Luis Alberiko Gil-Alana (University of Navarra) and Juncal Cunado (University of Navarra).

**Master of Economics and Finance** (MEF), University of Navarra, Pamplona, Spain

* Thesis title: *The Relationship between the Economic Value Added and the Market Value of the Equity*
* Supervisor: Rocío Sánchez Mangas (Universidad Autónoma de Madrid).

**Master of Business Economics** (Magna Cum Laude)**,** Francisco Marroquin University, Guatemala

* Thesis title: “Genesis and Crisis of Moral Principles in Contemporaneous Western Society from a Freudian Psychoanalytic Perspective.”
* Supervisor: Wenceslao Giménez-Bonet (Francisco Marroquin University).

**MBA** (Summa Cum Laude)**,** Francisco Marroquin University, Guatemala.

**Public Accountant and Auditor** (Summa Cum Laude), Francisco Marroquin University, Guatemala.

**TEACHING**

**Mercer University,** Stetson-Hatcher School of Business

2023 – present:

* Financial Analytics (Master in Business Analytics)
* Global Managerial Economics (MBA)
* Visual Reporting and Communication (Master in Business Analytics)

**Francisco Marroquin University (Guatemala and Panama),** School of Business and Faculty of Economics

* Valuation (MBA)
* Financial Econometrics (Master of Finance)
* Value-Based Management (LL.M.)
* Mergers and Acquisitions (LL.M.)
* Valuation Capstone (LL.M.)
* Corporate Finance (LL.M.)
* Economic Value Added (M.Sc. in Economics and Business)
* Financial Analysis (MBA)
* Budgeting (MBA)
* Working Capital Management (MBA)
* Financial Principles (Undergraduate program in Law)
* Financial Statement Analysis in different Industries (MBA)
* Microeconomics (MBA, LL.M., and Master in Real Estate Project Management)
* Macroeconomics (MBA, LL.M., Master in Real Estate Project Management, and Master in Finance)
* Business Valuation Capstone (Executive Program of Francisco Marroquin University and Tulane University)
* Financial Accounting (MBA, LL.M. Master in Finance)
* Competition and Entrepreneurship (Master in Economics)
* The Art Challenge (CoLab Francisco Marroquín University)

**Centro de Estudios Superiores Online de Madrid Manuel Ayau** **(Spain)** www.ommayau.com

* Financial Statement Analysis (Master in Value Investing)
* Accounting and Financial Analysis (Master in Design and Entrepreneurial Development of Cities)
* Introduction to Accounting (Master in Value Investing)

**RESEARCH INTERESTS**

* **Financial Econometrics** (distribution of returns, volatility models).
* **Quantitative Macroeconomics** (economic growth, trade cycle, public finances, economic convergence, unemployment, currency exchange rate, comparative economics, capital markets, and the real economy).
* **Art Market** (economic value of art, art market analysis, art entrepreneurship)
* Specific topics of applied econometrics (dynamic conditional score models, copulas, state space models, non-stationary time series, structural breaks, unit root tests, fractional integration).

**PUBLICATIONS IN FINANCE**

* (P24) Ayala, A, and Blazsek, S., Ruiz-Sanchez, M. (2025) Sample selection bias for Jackson Pollock auctions: A case study. **Applied Finance Letters**, accepted for publication.
* (P23) Ayala, A, and Blazsek, S., Subrahmanyam, V. (2025) Score-driven expected return and volatility spillovers between the Indian and United States stock markets. **Applied Economics**, <https://doi.org/10.1080/00036846.2025.2476775> .
* (P20) Ayala, A., Blazsek, S., and Licht, A. (2024) Score function scaling for QAR plus Beta-t-EGARCH: An empirical application to the S&P 500. **Applied Economics**, https:// doi.org/10.1080/00036846.2023.2208335.
* (P18) Ayala, A., Blazsek, S., and Licht, A. (2023) Volatility forecasting using quasi-score-driven models with an application to the coronavirus pandemic. **Studies in Nonlinear Dynamics & Econometrics**, <https://doi.org/10.1515/snde-2022-0085>.
* (P17) Ayala, A., Blazsek, S., and Licht, A. (2023) Comparison of Score-Driven Equity-Gold Portfolios During the COVID-19 Pandemic Using Model Confidence Sets. **Studies in Nonlinear Dynamics & Econometrics**, https://doi.org/10.1515/snde-2022-0107
* (P16) Ayala, A., Blazsek, S., and Escribano, A. (2023) Anticipating extreme losses using score-driven shape filters. **Studies in Nonlinear Dynamics & Econometrics**, https://doi.org/10.1515/snde-2021-0102
* (P14) Ayala, A., and Blazsek, S. (2021) Score-driven panel data models of the capital structure of US firms. **Applied Economics Letters**, 28 (19): 1666–1670. <https://doi.org/10.1080/13504851.2020.1845293>
* (P11) Ayala, A., and Blazsek, S. (2018) Score-driven copula models for portfolios of two risky assets, **The European Journal of Finance** 24 (18): 1861–1884. <https://doi.org/10.1080/1351847X.2018.1464488>
* (P10) Ayala, A. and Blazsek, S. (2018) Equity market neutral hedge funds and the stock market: an application of score-driven copula models. **Applied Economics**. https://doi.org/10.1080/00036846.2018.1440062
* (P7) Ayala, A. and Blazsek, S. (2014). Contagion of sovereign debt in the Eurozone, **Theoretical Economics Letters**, 4 (1): 98–109. <http://dx.doi.org/10.4236/tel.2014.41016>
* (P2) Ayala, A. and Blazsek, S. (2012). How has the financial crisis affected the fiscal convergence of Central and Eastern Europe to the Eurozone? **Applied Economics Letters**, 19 (5): 471–476. <http://dx.doi.org/10.1080/13504851.2011.583212>
* (P1) Ibargüen, G. and Ayala, A. (2006). A market proposal for auditing the financial statements of public companies, **Journal of Management for Value**, 1 (2).

**PUBLICATIONS IN ECONOMICS**

* (P22) Ayala, A, and Blazsek, S. (2025) Exogenous, endogenous, and observable switching models of industrial production in the United Kingdom. **Applied Economics**, <https://doi.org/10.1080/00036846.2025.2464823>.
* (P21) Blazsek, S., and Licht, A., Ayala, A., Su-Ping Liu (2024). Core inflation rate for China and the ASEAN-10 countries: Smoothed signal for score-driven local level plus scale models. **Studies in Nonlinear Dynamics & Econometrics,** <https://doi.org/10.1515/snde-2023-0042>.
* (P19) Ayala, A., Blazsek, S., and Licht, A. (2024) Signal Smoothing for Score-Driven Models: A Linear Approach, **Communications in Statistics – Simulation and Computation**, <https://doi.org/10.1080/03610918.2022.2032165>.
* (P15) Ayala, A., Blazsek, S., and Licht, A. (2022) Score-driven stochastic seasonality of the Russian rouble: An application case study for the period of 1999 to 2020, **Empirical Economics**, 62: 2179–2203. <http://link.springer.com/article/10.1007/s00181-021-02103-6>
* (P13) Ayala, A., and Blazsek, S. (2019) Score-driven models of stochastic seasonality in location and scale: An application case study of the Indian rupee to USD exchange rate. **Applied Economics**, 51 (37): 4083–4103. <https://doi.org/10.1080/00036846.2019.1588952>
* (P12) Ayala, A., and Blazsek, S. (2019) Score-driven currency exchange rate seasonality as applied to the Guatemalan Quetzal/US Dollar. **Journal of the Spanish Economic Association (SERIEs)**. 10 (1): 65–92. <https://doi.org/10.1007/s13209-018-0186-0>
* (P9) Ayala, A., Blazsek, S., Cuñado, J., Gil-Alana, L. (2016). Regime-switching purchasing power parity in Latin America: Monte Carlo unit root tests with dynamic conditional score, **Applied Economics**, 48 (29): 2675–2696. <http://dx.doi.org/10.1080/00036846.2015.1128076>
* (P8) Ayala, A. and Blazsek, S. (2014). Fiscal sustainability of Eurozone governments: An empirical review of the past decade, **Review of European Studies**, 6 (1): 143–150. <http://dx.doi.org/10.5539/res.v6n1p143>
* (P6) Ayala, A. and Blazsek, S.A. (2013). Structural breaks in public finances in Central and Eastern European countries, **Economic Systems**, 37 (1): 45–60. <http://dx.doi.org/10.1016/j.ecosys.2012.06.004>
* (P5) Ayala, A., Cuñado, J. and Gil-Alana, L. (2013). Real Convergence: Empirical Evidence for Latin America, **Applied Economics***,* 45 (22): 3220–3229. <https://doi.org/10.1080/00036846.2012.703317>
* (P4) Ayala, A., Cuñado, J. and Gil-Alana, L. (2012). Real convergence in Latin America: a fractionally integrated approach, **Applied Financial Economics**, 22 (20): 1713–1717. <https://doi.org/10.1080/09603107.2012.674204>
* (P3) Ayala, A., Cuñado, J. and Gil-Alana, L. (2012). Unemployment Hysteresis: Empirical Evidence for Latin America, **Journal of Applied Economics**, 15 (2): 213–233. <https://doi.org/10.1016/S1514-0326(12)60010-5>

**BOOKS, BOOKS CHAPTERS**

* (C1) Ayala, A., Blazsek, S., and González, R. B. (2015). Default risk of sovereign debt in Central America. In: Nigel Finch (Ed.), **Emerging Markets and Sovereign Risk** (pp. 18–44). ISBN 978-1-137-45065-4, Palgrave Macmillan.
* (B1) Ayala, Astrid (2011). **Génesis y crisis de los principios morales de la sociedad occidental contemporánea desde la perspectiva del psicoanálisis freudiano**. ISBN 978-3-8465-6329-8, Editorial Académica Española.

**SUBMITTED PAPERS**

* Blazsek, S., Escribano, A., and Ayala, A. (2025) Improved gradient scaling for score-driven filters with an application to stock market volatility. Submitted to the Journal of Econometrics.
* Blazsek, S., Ayala, A., and Subrahmanyam, V. (2025) Markov-switching score-driven models of scale and shape parameters: an application to the Indian stock market. Submitted to Empirical Economics.

**WORKING PAPERS**

* Improved gradient scaling for score-driven filters with an application to stock market volatility (with S. Blazsek and A. Escribano). Working Paper ECONOM-D-25-00085, **University Carlos III of Madrid**, Department of Economics, 2019. [https://hdl.handle.net/10016/45978](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fhdl.handle.net%2F10016%2F45978&data=05%7C02%7Cayala_a%40mercer.edu%7Cf5b591c988634a869d9008dd5251acb8%7C4fb34d2889b247109bcc30824d17fc30%7C0%7C0%7C638757232949208201%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXaW4zMiIsIkFOIjoiTWFpbCIsIldUIjoyfQ%3D%3D%7C0%7C%7C%7C&sdata=Y76vVzqiC42y5bk6aN8hH98KLn%2BYAUVpwIOpvMH4YCA%3D&reserved=0)
* Score-driven equity plus gold portfolios before and during the COVID-19 pandemic models (with S. Blazsek and A. Licht). Guatemalan Econometric Study Group Discussion Paper 1/2022, **Francisco Marroquin University**, School of Business, 2022. <https://en.ufm.edu/wp-content/uploads/2017/04/AYALA-BLAZSEK-LICHT-2022-GESG-WP.pdf>
* A short note on the scaling parameter in score-driven filters (with S. Blazsek and A. Licht). Guatemalan Econometric Study Group Discussion Paper 3/2022, **Francisco Marroquin University**, School of Business, 2022. <https://en.ufm.edu/wp-content/uploads/2017/04/AYALA-BLAZSEK-LICHT-2022-GESG-WP-3-2022.pdf>
* Optimal Choice of the Scaling Parameters in Score-Driven Filters (with S. Blazsek and A. Licht). Guatemalan Econometric Study Group Discussion Paper 4/2022, **Francisco Marroquin University**, School of Business, https://en.ufm.edu/wp-content/uploads/2017/04/BLAZSEK-AYALA-LICHT-2022-GESG-WP-04-2022.pdf
* Volatility forecasting for the coronavirus pandemic using quasi-score-driven models (with S. Blazsek and A. Licht). Guatemalan Econometric Study Group Discussion Paper 2/2021, **Francisco Marroquin University**, School of Business, 2021. https://en.ufm.edu/wp-content/uploads/2021/01/AYALA-BLAZSEK-LICHT-2021-GESG-WP-2-2021.pdf
* Optimal signal extraction for score-driven models (with S. Blazsek and A. Licht). Guatemalan Econometric Study Group Discussion Paper 1/2021, **Francisco Marroquin University**, School of Business, 2021. <https://en.ufm.edu/wp-content/uploads/2021/01/AYALA-BLAZSEK-LICHT-2021-GESG-WP-2021-01.pdf>
* Dynamic analysis of the capital structure of S&P 500 firms under unconventional monetary policy using score-driven panel data models (with S. Blazsek). Guatemalan Econometric Study Group Discussion Paper 3/2020, **Francisco Marroquin University**, School of Business, 2020. <https://en.ufm.edu/wp-content/uploads/2020/06/AYALA-BLAZSEK-2020-GESG-WP-1.pdf>
* Maximum likelihood estimation of score-driven models with dynamic shape parameters: an application to Monte Carlo value-at-risk (with S. Blazsek and A. Escribano). Working Paper 19-12, **University Carlos III of Madrid**, Department of Economics, 2019. <https://e-archivo.uc3m.es/handle/10016/28638>
* Score-driven time series models with dynamic shape: an application to the Standard & Poor's 500 index (with S. Blazsek and A. Escribano). Working Paper 19-05, **University Carlos III of Madrid**, Department of Economics, 2019. <http://hdl.handle.net/10016/28133>
* Score-driven models of local level, seasonality and volatility: an application to the currency exchange rate of Indian rupee to USD (with S. Blazsek), Guatemalan Econometric Study Group Discussion Paper 1/2018, **Francisco Marroquin University**, School of Business, 2018. <https://en.ufm.edu/wp-content/uploads/2017/04/AYALA-BLAZSEK-2018-GESG-WP.pdf>
* New score-driven models for trimming and Winsorizing: an application for Guatemalan Quetzal to US Dollar (with S. Blazsek), Guatemalan Econometric Study Group Discussion Paper 2/2017, **Francisco Marroquin University**, School of Business, 2017. <https://en.ufm.edu/wp-content/uploads/2017/04/AYALA-BLAZSEK-2017-UFM-WP.pdf>

**CONFERENCES, WORKSHOPS, RESEARCH SEMINARS**

* Exogenous, Observable, and Endogenous Switching Models of Industrial Production in the United Kingdom (with S. Blazsek). **Conference on Finance, Economics, Management, and IT Business FEMIB**, Portugal, April 2025.
* Exogenous, Observable, and Endogenous Switching Models of Industrial Production in the United Kingdom (with S. Blazsek). **Atlanta Research Conference, Mercer University**, April 2025.
* What can Jackson Pollock tell us about the Art Market? (with S. Blazsek and M. Ruiz-Sánchez). **Vietnam Symposium in Banking and Finance 2024**, Banking Academy, Hanoi, Vietnam, October 2024.
* Scaling parameters for QAR plus beta-t-EGARCH (with S. Blazsek and A. Licht). **25th Dynamic Econometrics Conference**, Bayes Business School, London, UK, April 2023.
* Anticipating extreme losses using score-driven shape filters (with S. Blazsek and A. Escribano), **Summer Workshop in Economics of the Hungarian Academy of Sciences**, August 2022 (online).
* Volatility forecasting for the coronavirus pandemic using quasi-score-driven models (with S. Blazsek and A. Licht), **World Finance Banking Symposium**, Budapest, December 2021 (online).
* Volatility forecasting for the coronavirus pandemic using quasi-score-driven models (with S. Blazsek and A. Licht), 2021 **Vietnam Symposium in Banking and Finance**, Hanoi, October 2021 (online).
* Volatility forecasting for the coronavirus pandemic using quasi-score-driven models (with S. Blazsek and A. Licht), 24th **Dynamic Econometrics Conference**, Timberlake, September 2021 (online).
* Optimal signal extraction for score-driven models (with S. Blazsek and A. Licht), 23rd **Dynamic Econometrics Conference**, Timberlake, March 2021 (online).
* Score-driven models with stochastic seasonality for currency exchange rates (with S. Blazsek), Research Seminar, University of Istmo, Guatemala City, July 2019.
* Score-driven copula models for financial portfolios (with S. Blazsek), Research Seminar, University of Istmo, Guatemala City, November 2018.
* New score-driven models for trimming and Winsorizing: An application for Guatemalan Quetzal to US Dollar, **Annual Economic Research Conference (SIEG)**, **Bank of Guatemala**, Guatemala City, October 2018.
* Endogenous switching vector autoregression: stock market and economic growth dynamics in China, Financial Forecasting, **Oxford-Man Institute - Society for Financial Econometrics (OMI-SoFiE)** Financial Econometrics Summer School, **University of Oxford**, Oxford, July 2013.
* A dynamic latent-factor panel data model for public debt in the Eurozone, **Hungarian Economic Society Annual Conference**, Budapest, December 2011.
* A dynamic latent-factor panel data model for public debt in the Eurozone, **Macro-Finance Workshop**, **University of Navarra**, Pamplona, November 2011.

**GUATEMALAN ECONOMETRIC STUDY GROUP (GESG) RESEARCH SEMINARS**

**Guatemalan Econometric Study Group (GESG)** research seminar presentations at **Francisco Marroquin University** since 2014. See the link: <https://en.ufm.edu/gesg/research-seminars/>, or in the next section.

* Score-driven time series models with dynamic shape: an application to the Standard & Poor’s 500 index, March 2019.
* Score-driven models of local level, seasonality, and volatility: an application to the currency exchange rate of Indian rupee to USD, June 2018.
* New score-driven models for trimming and Winsorizing: an application for Guatemalan Quetzal to US Dollar, September 2017.
* Equity market neutral hedge funds and the stock market: an application of score-driven copula models, Agosto 2017.
* Forecast performance of dynamic conditional score copula models, June 2016.
* Regime-switching purchasing power parity in Latin America: Monte Carlo unit root tests with dynamic conditional score, January 2016.
* Default risk of sovereign debt in Central America, November 2014.
* Structural breaks in public finances in Central and Eastern European countries, June 2014.

**REFEREE FOR JOURNALS**

* Domain Social Sciences and Humanities of the Netherlands Organisation for Scientific Research (NWO, the Dutch research council)
* National Tax Journal
* Applied Financial Economics
* Technological and Economic Development of Economy
* Applied Economics
* Applied Economic Letters
* Latin American Economic Review
* International Journal of Social Economics

**EDITORIAL BOARD MEMBERSHIP**

* Journal of New Finance

**RESEARCH VISITS**

1/2012 Postgraduate Research Visit, University of Navarra, Pamplona

8/2010    Visiting researcher (fiscal convergence of CEE countries), Central Bank of Hungary, Budapest

**RESEARCH PROJECTS**

* 2022-2024: Spillover Effects of COVID-19 Pandemic in G20 Countries”. Financing organization: Wenzhou Kean University. Main researcher: Su-Ping Liu.
* 2010: Convergence of CEE countries to the Eurozone in the presence of structural changes. Members of the project: Jerome Vandenbussche (Deputy Division Chief, IMF), Szabolcs Blazsek (University of Navarra) and Astrid Ayala (Francisco Marroquin University). Financing organization: Central Bank of Hungary.

**RESEARCH TRAINING COURSES**

* “Forecast Pro”. Francisco Marroquin University, July 2019, lecturer: **Szabolcs Blazsek**.
* “Gauss Training Course”. Francisco Marroquin University, December 2016, lecturer: **Szabolcs Blazsek**.
* “Macroeconomic Density Forecasting and Nowcasting”. New Horizons, Computer Learning Centre, New York, Timberlake, 31st October to 2nd November 2016, lecturer: **Andrea Carriero**.
* “Time Series Analysis and Modelling”. Clare College, **University of Cambridge**, Cambridge, Timberlake, 20th to 22nd July 2015, lecturer: **Andrew Harvey**.
* “Stata Training Course”. Francisco Marroquin University, from 9th June to 16th July 2015, lecturer: **Diego Aycinena**.
* “Dynamic Models for Volatility & Heavy Tails”. **Cass Business School**, **London**, Timberlake, 16th December 2014, lecturer: **Andrew Harvey**.
* “2013 Econometrics Summer School at the University of Cambridge”. **University of Cambridge**, Cambridge, Timberlake, from 21st to 28th July 2013, lecturers: **Andrew Harvey, Sean Holly, and Melvyn Weeks**.
* “International program in finance and managerial economics”. School of Management, **Boston University**, 2006.

**MEMBERSHIPS**

* Guatemalan Econometric Study Group (2014-present) (https://en.ufm.edu/gesg/)
* The Society for Financial Econometrics (2013-2015) (http://sofie.stern.nyu.edu/)