

## EDUCATION

<b>Master of Data Science for Public Policy</b> , <i>Hertie School of Governance, Berlin, Germany</i> sehr gut (very good), GWA: 1.5, Merit Scholar	<b>September 2021 — June 2023</b>
<b>Master of Science in Statistics</b> , <i>University of the Philippines – Diliman, School of Statistics</i> 9 units completed (part-time), GWA: 1.25	<b>September 2020 — June 2021</b>
<b>Bachelor of Science in Statistics</b> , <i>University of the Philippines – Diliman, School of Statistics</i> Cum Laude, GWA: 1.717, Full Scholar of the Department of Science and Technology (Philippines)	<b>June 2012 — June 2016</b>

## PROFESSIONAL EXPERIENCE

<b>Data Scientist (part-time)</b> <i>Compass Lexecon EMEA</i>	<b>August 2022 — June 2023</b> <i>Berlin, Germany</i>
<ul style="list-style-type: none"><li>Assists in merger review through web scraping, text mining, and geographical analysis in Python and R.</li><li>Develops an R package and app for geographic market analysis, including tools for geocoding, computing origin-destination distance and travel times, calculating isochrones, and creating interactive maps.</li><li>Develops and maintains a Python-based search tool using Flask, Dash, and MongoDB for accessing and analyzing competition-related cases from the European Commission and UK Competition Markets Authority.</li><li>Performs ad hoc tasks: maintains a PowerBI dashboard for internal data tracking, analyzes data using Natural Language Processing techniques, configures a cookiecutter with <code>renv</code> for managing R project environments, and delivers R and RStudio training to competition economists and analysts.</li></ul>	
<b>Research Assistant (part-time)</b> <i>WZB Berlin Social Science Center, Institutions and Political Inequality Unit</i>	<b>October 2021 — July 2022</b> <i>Berlin, Germany</i>
<ul style="list-style-type: none"><li>Tested the R package, <code>CausalQueries</code> used to build, update, and query causal models. Updated the R bookdown <code>Causal Models</code>.</li><li>Assisted in code cleanup and testing for a study on evaluating social scientific models of COVID mortality within and across states.</li></ul>	
<b>Economic Research and Statistics Consultant (full-time)</b> <i>Asian Development Bank (ADB), Economic Research and Regional Cooperation Department</i>	<b>April 2019 — August 2021</b> <i>Manila Headquarters, Philippines</i>
<ul style="list-style-type: none"><li>Analyzed the impact of infrastructure programs on rural road accessibility (Sri Lanka), urban travel behavior (India, focusing on the Bangalore Metro), and job accessibility (Philippines, specifically in the catchment area of the Philippine South Commuter Railway) by conducting data analysis, regressions, and spatial mapping in STATA and R.</li><li>Analyzed the effects of COVID-19 lockdown policies in the Philippines on urban mobility by calculating origin-to-destination flows, distance matrices, and commuter volumes using STATA and CSPro. Conducted cross-country panel regressions to examine the impact of non-pharmaceutical policies (e.g., contact tracing, mass testing) on COVID-19 transmission.</li><li>Analyzed housing affordability, estimated agglomeration effects on firm innovation, summarized data on car ownership, transport cost, land, and housing, and reviewed literature on traffic congestion, transport infrastructure, and land-use management in select Asian economies for the <a href="#">Asian Development Outlook 2019 Update (ADOU)</a> theme chapter.</li><li>Prepared notes on Indonesia's poverty estimation and summarized census and survey data using World Bank's PovMap.</li></ul>	
<b>Competition Policy Consultant (part-time)</b> <i>Philippine Competition Commission (PCC), Government of the Philippines</i>	<b>February 2021 — April 2021</b> <i>Quezon City, Philippines</i>
<ul style="list-style-type: none"><li>Drafted a research paper, "Ensuring Fair and Open Access in Philippine e-commerce Retail Platforms," establishing a framework to assess competition in e-commerce markets. Reviewed literature on e-commerce trends and P2B trading practices, analyzed terms and conditions of top platforms in line with the EU's P2B Regulation, and surveyed relevant Philippine laws and policies.</li></ul>	
<b>Competition Policy Researcher II (full-time) at the PCC</b>	<b>September 2017 — April 2019</b>
<ul style="list-style-type: none"><li>Led quantitative analyses of mergers and acquisitions across various industries such as transport, real estate, retail, manufacturing, logistics, digital, and knowledge process outsourcing. Conducted competition analyses of enforcement cases involving abuse of dominant position and anti-competitive agreements in the energy, retail petroleum, and rice sectors.</li><li>Performed critical loss analysis, computed diversion ratios, and conducted regression and correlation analysis in R. Conducted web scraping, text mining, and geospatial analysis in R for market competition assessment.</li><li>Pioneered the use of R tools for geographic market analysis. Developed an approach for consumer-supplier location and route mapping, isochrones and iso-distance mapping, and computation of origin-destination distance and travel time.</li></ul>	
<b>Competition Policy Researcher I (full-time) at the PCC</b>	<b>November 2016 — August 2017</b>
<ul style="list-style-type: none"><li>Designed and analyzed household and firm surveys to measure awareness and perception of the Philippine Competition Act (PCA) and PCC, and rapid surveys to understand consumer preferences, define relevant markets, and monitor prices.</li><li>Drafted regulatory impact assessment, policy brief, and action plan for SMEs on competition policy and law issues.</li><li>Facilitated FGDs for SMEs for the APEC capacity-building project. Conducted seminars for appellate lawyers to raise awareness of the PCA. Delivered training on applied statistics in R and STATA with the Philippine Statistical Research and Training Institute.</li></ul>	

## DATA SCIENCE PROJECTS

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<b>Predicting Merger Decision Outcomes of the European Commission</b> <i>Master Thesis</i>	<b>October 2022 — May 2023</b> Hertie School
• A novel application of Natural Language Processing and Machine Learning to predict merger decision outcomes of the European Commission by analyzing extracted text from official merger decisions. Identified a Support Vector Machine linear classifier as the best-performing model in predicting mergers that were either approved unconditionally or subject to conditions with an 84% recall and 63% precision.	
<b>Analyzing the German Public Procurement Network: Implications for Corruption Risk</b> <i>A Research Project for Applied Network Analysis (Grade: 1.30/95%)</i>	<b>April 2023 — May 2023</b> Hertie School
• Analyzed corruption risk using single-bidding rates in centralized German public contracts 2008-2016 by conducting network-based approaches such as R-A clustering, degree distributions, k-core decomposition, modularity maximization, and measurement of nodal centrality.	
<b>Classification of Unstructured Documents: Transfer Learning with BERT</b> <i>A Tutorial Project for Deep Learning (Grade: 1.70/86%)</i>	<b>November 2022 — December 2022</b> Hertie School
• A Python tutorial for building a text classification pipeline using unstructured documents with Bidirectional Encoder Representations from Transformers (BERT). The tutorial focuses on predicting stakeholder agreement with the EU's Digital Markets Act proposal using public consultation documents.	
<b>Emotionality and Rationality in Speeches of EU Commissioners</b> <i>A Research Project for Text as Data (Grade: 1.30/92%)</i>	<b>November 2022</b> Hertie School
• Investigated the variation in the use of reason and emotion in communicating politics of the European Commission across time and events using word2vec word embeddings and structural topic modeling.	
<b>High Resolution Traffic Accident Prediction in Berlin</b> <i>A Research Project for Machine Learning (Grade: 1.30/94%)</i>	<b>February 2022 — May 2022</b> Hertie School
• Predicted the occurrence of accidents on a given road segment at a given date and hour in Berlin by training machine learning models such as Logistic Regression, Random Forest, Balanced Random Forest, Balanced Bagging, Support Vector Classifier, and XGBoost using data on road accident 2018-2020, road network, and historic weather.	
<b>Spotify-MatchedR</b> <i>A Project for Intro to Data Science (Grade: 1.30/92%)</i>	<b>November 2021 — December 2021</b> Hertie School
• An R shiny app for measuring music taste compatibility of 5 users based on their 100 most listened songs 2018-2020 using Spotify's Web API. Musical metrics like danceability and popularity were visualized using <i>plotly</i> .	
<b>GetHelp</b> <i>A Project for Data Structures and Algorithms (Grade: 1.00/96%)</i>	<b>September 2021 — December 2021</b> Hertie School
• A Python-based app built using object-oriented programming to match requests (e.g., ride, tutor) of students of Hertie School.	

## PUBLICATIONS

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Arbo, M.A.G. (2023). Predicting merger decision outcomes of the European Commission: A Natural Language Processing and Machine Learning approach. *Thesis for Master of Data Science for Public Policy*. Hertie School.

Helble, M., Lee, O.K., & Arbo, M.A.G. (2020). How (Un)affordable is housing in developing Asia? *International Journal of Urban Sciences*. doi: 10.1080/12265934.2020.1810104

## SKILLS

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<b>MS Office Tools</b>	Excel, Word, Power Point
<b>Programming Languages</b>	R, Python, SQL (sqldf and SQLite in R), LaTeX (Overleaf)
<b>Programming Tools</b>	R Studio, Anaconda, Github, VS Code, Spyder, Jupyter Notebook, Google Colab, Power BI
<b>Statistical Tools</b>	STATA, CSPro, SAS, Eviews, SPSS
<b>Version Control</b>	Git
<b>Communication</b>	Fluent in English and Tagalog

## INTERNSHIPS

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<b>Risk Underwriting Analyst (full-time)</b> <i>Home Credit</i>	<b>August 2016 — October 2016</b> Taguig City, Philippines
• Assessed customers' credit risk using underwriting and risk modeling tools in Oracle and SQL	
<b>TALAS Big Data and Insights (full-time)</b> <i>SMART Communications</i>	<b>June 2015 — July 2015</b> Makati City, Philippines
• Conducted regression analysis to map past and present events using telecommunication activity surges from non-identifying usage data of subscribers in metropolitan areas	

## MEMBERSHIPS AND AFFILIATIONS

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<b>Phi Kappa Phi Honor Society</b>	June 2016 — Present
<b>UP School of Statistics Alumni Association</b>	June 2016 — Present

## RESEARCH OUTPUTS AND CONTRIBUTIONS

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- Asian Development Outlook 2019 Update: Fostering Growth and Inclusion in Asia's Cities. (2019).
- Chen, L., Go, E., & Jiang, Y. (2021). Accessibility Analysis of the South Commuter Railway Project of the Philippines. ADB Brief, (185).
- Chen, L., Hasan, R., & Jiang, Y. (2020). Urban Agglomeration and Firm Innovation: Evidence from Asia. ADB Economics Working Paper Series, (616).
- Chen, L., Lu, Y., & Nanayakkara, A. (2021). Rural Road Connectivity and Local Economic Activity: Evidence from Sri Lanka's Integrated Road Investment Program. ADB South Asia Working Paper Series, (87).
- Chen, L., Raitzer, D., Hasan, R., Lavado, R., & Velarde, O. (2020). What Works to Control COVID-19? Econometric Analysis of a Cross-Country Panel. Econometric Analysis of a Cross-Country Panel. ADB Economics Working Paper Series, (625).
- Gibson, J., Jiang, Y., & Susantono, B. (2022). Revisiting the role of secondary towns: Effects of different types of urban growth on poverty in Indonesia. (No. 22/05).
- **Arbo, M.A.G. & Marquez, C. J.** The Link Between Secondary Cohort Survival Rate and Socioeconomic Development. Undergraduate research paper presented at the 2016 Faculty-Student Conference on Statistical Sciences, Los Baños, Philippines

## TRAINING AND SEMINARS

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### Data Science, Statistics, and Econometrics

- Data Science Summer School by Hertie School Data Science Lab 2022. Online course. 30 hrs
- Data Science Summer School by Hertie School Data Science Lab 2021. Online course. 30 hrs
- Python Conference in Asia-Pacific 2019. Makati City, PH. 16 hrs
- Philippine Statistical Research and Training Institute Capacity Building on Applied Statistics 2018. Quezon City, PH. 50 hrs
- Coursera: The Data Scientist's Toolbox 2017. Online course. 14 hrs
- Advanced STATA Training 2017. Pasig City, PH. 10 hrs
- Faculty-Student Conference on Statistical Sciences 2015. Los Baños, PH. 15 hrs

### Urban Economics

- Webinar on Restarting Economies and COVID-19 Control 2020. Quezon City, PH. 1.5 hrs
- Economists' Forum 2020. Mandaluyong City, PH. 2 hrs
- Seminar on Urban Agglomeration and Firm Innovation: Evidence from Asia 2019. Mandaluyong City, PH. 2 hrs
- Asian Development Outlook 2019 Update Launch 2019. Mandaluyong City, PH. 2 hrs
- Internal Workshop on ADOU 2019 Theme Chapter: 2019. Mandaluyong City, PH. 16 hrs

### Competition Law and Economics

- Global Antitrust Institute Economics Program for Competition Enforcers 2018. Santa Monica, California, USA. 40 hrs
- Asian Competition Forum 13th Annual Conference 2017. Hong Kong. 16 hrs
- Japan- Association of Southeast Asian Nations (ASEAN) Integration Fund Program Sub-Regional Workshop on Competition Analysis in E-commerce 2017. Jakarta, Indonesia. 16 hrs
- Singapore Academy of Law Competition Law Conference: New Approaches for a New Economy 2017. Singapore. 8 hrs
- Competition Assessment Tools to address Market Distortions 2017. Pasig City, PH. 16 hrs
- Technical Consultation on Competitive Neutrality 2017. Pasig City, PH. 8 hrs
- World Bank Lecture on Welfare Economics 2017. Pasig City, PH. 8 hrs
- Competition Economics Training: New Trends and Development 2017. Pasig, PH. 8 hrs

### Merger and Enforcement Analysis

- ASEAN Australian New Zealand Free Trade Agreement Competition Law Program Module 4: Investigating Abuse of Dominance Workshop 2018. Hanoi, Vietnam. 24 hrs
- Econometric Analysis of Cartel Enforcement 2018. Pasig City, PH. 24 hrs
- World Bank Workshop on Public Procurement 2018. Taguig, PH. 8 hrs
- World Bank Workshop on Merger Review: Economic Analysis and Procedural Steps 2018. Taguig City, PH. 8 hrs
- Workshop on Merger Review and Analysis and Interviewing Skills 2017. Pasig City, PH. 40 hrs
- Workshop on Control of Entities and Joint Venture 2017. Pasig City, PH. 8 hrs