

Applied Marketing Data Science

Econometric Modeling and High-Yield Asset Optimization Frameworks

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Level: PhD Seminar / Advanced Research Track

Course Overview

This doctoral seminar focuses on state-of-the-art econometric architectures required to publish in Top-Tier journals. The curriculum targets the advanced modeling of unobserved heterogeneity, structural endogeneity, and dynamic market feedback loops to optimize marketing resource allocation.

Core Methodological Modules

1. Advanced Covariance-Based SEM (CB-SEM)

Second-order latent factor models and multi-group structural assessments. Testing for measurement invariance (configural, metric, scalar). Analysis of non-recursive models with feedback loops and instrumental variable integration.

2. Partial Least Squares SEM (PLS-SEM)

Variance-based structural equation modeling for predictive and exploratory frameworks. Evaluation of formative vs. reflective measurement models. Bootstrapping procedures, blindfolding techniques (Q^2 predictive relevance), and PLSpredict evaluation.

3. Discrete Choice Extensions & Mixed Logit

Overcoming Multinomial Logit limitations. Mathematical formulation of Hierarchical Bayes (HB) estimations and Mixed Logit (Random Parameters Logit) models to account for continuous unobserved consumer heterogeneity.

4. Econometric Mitigation of Endogeneity

Identifying structural endogeneity via omitted variables, measurement errors, and simultaneity. Deployment of Instrumental Variables (*IV*), Two-Stage Least Squares (*2SLS*), and Control Function approaches in quantitative behavioral marketing.

5. Longitudinal & Panel Data Modeling

Estimation of Fixed Effects (*FE*) and Random Effects (*RE*) econometric panel designs. Generalized Estimating Equations (*GEE*) and Dynamic Panel formulations (Arellano-Bond estimators) tracking time-varying asset parameters.