Duong Trinh

CONTACT
INFORMATION

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RESEARCH
INTERESTS

Bayesian Microeconometrics; Applied Econometrics; Applied Microeconomics
Causal Inference; Machine Learning; High-dimensional Models; Spatial & Network Models

EDUCATION

Ph.D. in Economics   2021 – 2025 (expected)
University of Glasgow, Glasgow, UK

· Advisors: Professor Dimitris Korobilis, Dr. Kenichi Shimizu, Dr. Santiago Montoya-Blandón.
· Thesis title: *Three Essays in Bayesian Microeconometrics: Embracing Causality and Heterogeneity.*

M.Res. in Economics (Distinction)   2019 – 2021
University of Glasgow, Glasgow, UK

· Dissertation title: *Inference on Treatment Effects with High-dimensional Controls: Frequentist and Bayesian Approaches.*

Pre-Master in Economics (Excellent)   2018
Center of Research in Economics, Management and Environment, Hanoi, Vietnam

B.A. in International Business Economics (Excellent)   2014 – 2018
Foreign Trade University, Hanoi, Vietnam

REFERENCES

Professor **Dimitris Korobilis**, Ph.D.
Adam Smith Business School, University of Glasgow
Dimitris Korobilis@glasgow.ac.uk

Dr. **Santiago Montoya-Blandón**
Adam Smith Business School, University of Glasgow
santiago.montoya-blandon@glasgow.ac.uk

Dr. **Kenichi Shimizu**
Department of Economics, University of Alberta
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JOB MARKET PAPER   **Causal Inference on Quantiles in High Dimensions: A Bayesian Approach**, [Link]

Abstract: This paper proposes a novel approach, Bayesian Analog of Doubly Robust (BADR) estimation, to estimate unconditional Quantile Treatment Effects (QTEs) in observational studies. By augmenting the proposed estimator with shrinkage priors, this framework can account for high-dimensional covariates and feature a flexible Bayesian modeling strategy with favorable frequentist properties in finite samples, even when either the treatment assignment or outcome models are misspecified. The proposed approach offers a straightforward and adaptable implementation for incorporating probabilistic machine learning techniques to fit the propensity score and conditional cumulative distribution function, followed by combining posterior draws. This enables the effective handling of high-dimensional covariate spaces or nonlinear relationships to achieve better accuracy and appropriate uncertainty quantification. The simulation results show that BADR estimators yield a substantial improvement in bias reduction for QTE estimates compared with popular alternative estimators found in the literature. We revisit the role of microcredit expansion and loan access on Moroccan household outcomes, demonstrating how the new method adds value in characterizing heterogeneous distributional impacts on outcomes and detecting changes in overall economic inequality, which is also appealing to other applied contexts.

Bayesian Causal Inference in the Presence of Endogenous Selection into Treatment and Spillovers. (2024)

Abstract: This paper proposes a new approach utilizing network or spatial data to identify and estimate direct and indirect causal effects amid selection-on-unobservables and spillovers. This situation occurs due to the violation of unconfoundedness and SUTVA assumptions, typically assumed in causal inference literature but often implausible in many economic scenarios. Our devised framework nests the Generalized Roy Model to explicitly account for endogenous selection into treatment, while capturing spillovers through exposure mapping to neighbors' treatment. This allows for heterogeneous effects across individuals and enables the exploration of various causal estimands beyond the mean. We develop Bayesian estimators based on data augmentation methods, offering efficient computation and proper uncertainty quantification. We design a simulation study to assess the performance of the proposed approach using both calibrated synthetic data and real friendship network data from the Add-Health study. Finally, we apply our method to evaluate the Opportunity Zones (OZ) program, which aims to stimulate economic growth in distressed U.S. census tracts through tax incentives. Our results show both direct and indirect positive impacts on housing unit growth in designated Qualified Opportunity Zones (QOZs), but unselected tracts (non-QOZs) experience no beneficial spillovers, remaining at a disadvantage. The differences between QOZs and non-QOZs imply extending the positive effects to non-QOZs seems unlikely. Moreover, our model predicts that offering investment tax credits to non-QOZs would even lead to negative outcomes, making the program's expansion to these areas ineffective.

A Comparative Review of Bayesian Shrinkage and Variable Selection in Econometrics.
(with Dimitris Korobilis, Kenichi Shimizu) (2022)

Abstract: Despite the abundance of shrinkage and variable selection priors proposed in the literature, large-scale comparisons of their performance in econometric applications remain limited. This study aims to investigate the robustness of Bayesian prior configurations across different settings, including high-dimensional scenarios that deviate from the benchmark linearity and Gaussianity assumptions. We consider 10 hierarchical priors and tackle computation using the Gibbs sampler. Our focus is on prediction, and we explore whether theoretical guarantees for Bayesian priors hold in time-series models with conditionally dependent likelihoods. Furthermore, we seek to determine if Bayesian priors can serve as data-driven mechanisms in problems with large parameter spaces where case-by-case prior elicitation is impractical. Methodologically, this study contributes to the existing literature through two exercises. The first setting examines models with multiple structural breaks. We transform an inherently nonlinear problem into a linear high-dimensional one and assess the performance of approaches utilizing shrinkage and variable selection priors. In the second exercise, we investigate the forecasting performance as we move from a small vector autoregression (VAR) model with shrinkage to larger dimensions, wherein these priors facilitate automatic or minimal tuning. Our findings aim to provide insights into the robustness and applicability of Bayesian priors in diverse settings.

Goverment Disclosure in the Pandemic. (2020)

Abstract: Motivated by the pandemic COVID-19, this paper aims to explore the optimal policy for public information release during an epidemic by employing the framework of Information Design and Bayesian Persuasion. The paper formulates a model of government information disclosure to the public and, based on theoretical analysis, predicts that when the Government possesses commitment power, any partial information disclosure with a partition structure is better than no information disclosure but not as good as full information disclosure, in terms of ex-ante social welfare.

Early Career Gender Wage Gap: First Evidence in Vietnam.
(with Anh Nguyen Ngoc, Hai Doan Ma, Thuc Hoang Kim) (2018)

Abstract: This paper examines the gender wage gap during the transition from school to work period in Vietnam, utilizing the Oaxaca decomposition method and the Heckman sample selection procedure. Leveraging the unique data from the Vietnam School-to-Work Transition Surveys 2015 (VSWTS 2015) for youngsters, we uncover some meaningful findings about early career wages. Firstly, some determinants of early career wages are confirmed, consistent with human capital theory. Actual working experience, highest level of education, and job tenure significantly impact

hourly wages. In line with job shopping theory, the level of job mobility has a negative effect on wages in several cases. Secondly, the analysis reveals a wage gap between young males and females. Although young female workers tend to possess advantageous endowments that positively impact earnings, their average wage is lower than that of their male counterparts. The wage gap even widens when work characteristics are considered. This unexplained wage gap is typically implied as gender discrimination in the literature. Lastly, there is evidence that two gender groups self-select differently into the wage employment sector. Nonemployed women might possess higher productivity-related characteristics versus employed counterparts, and if they worked as salaried employees, they would earn more than actual wage workers on average. Taking this into account slightly reduces the wage gap.

WORK IN PROGRESS

Selection-corrected Spatial Autoregressive Mixture Model.
(with Santiago Montoya-Blandón).
Abstract: The spatial autoregressive (SAR) model is commonly used to study social interactions that involve networks. Nonetheless, the standard form of SAR has two assumptions that limit its applicability: homogeneous network effects and exogenous network structures. Despite the fact that SAR enables an individual's outcomes to depend on the weighted average of other individuals' outcomes, the first assumption is unrealistic in many situations, where some individuals may be more susceptible or influential than others. The second assumption is violated when unobserved factors affect both network link decisions and economic outcomes, leading to an endogenous selection bias problem due to the correlation between the spatial weight matrix, which represents the network structure, and the disturbance term of the model. To address these limitations, we propose an econometric framework that employs a finite-mixture distribution to capture the heterogeneity pattern in the SAR model and accounts for the endogenous network formation process. For estimation and inference, we develop a Bayesian Markov chain Monte Carlo algorithm that can handle the complex likelihood function and latent data structure, which pose computational challenges. Simulation results indicate that our method performs well in finite samples and is potentially suitable for studying social and economic networks. We plan to use the proposed framework to investigate the determinants that drive firms to form technological links and the (possibly heterogeneous) spillover effects on firm outcomes that are mediated through this network of alliances. Specifically, we will assess the influence and vulnerability of firms to exogenous R&D policy shocks in the alliance network.

PUBLISHED PAPERS

Firm Export and the Impact of Foreign Ownership in Vietnam: A Micro-data Analysis.
(with Vinh Nguyen Thi Thuy), *Journal of Economic Development* (2020), 45(1).
Abstract: This paper investigates the impact of foreign ownership on firm exports in Vietnam and analyzes how export participation and export intensity vary with ownership status by comparing Foreign Direct Investment enterprises (FDI enterprises) versus domestic firms, and wholly-foreign-owned enterprises (WFs) versus foreign joint ventures (JVs). Using data from 2010-2015 Vietnamese Enterprise Survey (VES), we document that after controlling for firm characteristics, industry, and region, FDI enterprises have higher export participation and higher export intensity than local firms. The finding supports the hypothesis that FDI enterprises inherit from foreign firms competitive advantages and therefore become superior in exports. We also find that while export participation is similar between JVs and WFs, export intensity is significantly higher for WFs than for JVs. This suggests that export-oriented foreign investors tend to establish 100% foreign-owned companies to exploit advantages of labor costs or natural resources, while domestic-oriented firms tend to form joint ventures to penetrate the domestic market.

The Impact of Exchange Rate Volatility on Exports in Vietnam: A Bounds Testing Approach.
(with Vinh Nguyen Thi Thuy), *Journal of Risk and Financial Management* (2019), 12(1).
Abstract: This paper investigates the impact of exchange rate volatility on exports in Vietnam, using data spanning from the opening quarter of 2000 to the final quarter of 2014. The paper applies the autoregressive distributed lag (ARDL) bounds testing approach to the analysis of level relationships between effective exchange rate volatility and exports. Employing the demand function of exports, the paper also considers the effect of depreciation and foreign income on exports in Vietnam. The results unveil that exchange rate volatility negatively affects the export volume in the long run, as anticipated. A depreciation of the domestic currency affects exports

negatively in the short run, but positively in the long run, which aligns with the J curve effect. Surprisingly, an increase in the real income of a foreign country actually leads to a decrease in Vietnamese export volume. These findings suggest some policy implications in managing the exchange rate system and promoting exports in Vietnam.

TEACHING EXPERIENCE	**University of Glasgow**, Glasgow, UK	
	Graduate Teaching Assistant	Sep 2020 – present

- · Bayesian Data Analysis (Graduate) | Spring 2025
- · Basic Econometrics (Graduate) | Fall 2023, 2024, 2025
- · Econometrics 2 (Undergraduate) | Spring 2024
- · Econometrics 1 (Undergraduate) | Fall 2020, 2021
- · Introductory Statistics for Economists (Undergraduate) | Spring 2022, 2024, 2025

RESEARCH EXPERIENCE	**The Development and Policies Research Center**, Hanoi, Vietnam	
	Research Intern, Research Assistant	2017 - 2018
	Institute of Economics and International Trade, Hanoi, Vietnam	
	Research Intern	2016

CONFERENCE PRESENTATIONS	Annual Conference of International Association for Applied Econometrics (IAAE), Thessaloniki, Greece	2024
	5$^{\text{th}}$ Panmure House Annual PhD Workshop, Edinburgh, UK	2022
	12$^{\text{th}}$ Vietnam Economists Annual Meeting (VEAM), Dalat, Vietnam	2019
	11$^{\text{th}}$ Vietnam Economists Annual Meeting (VEAM), Hanoi, Vietnam	2018
	13$^{\text{th}}$ Asia Pacific Trade Seminars (APTS), Hanoi, Vietnam	2017
	Others: Volunteer at RES and SES Annual Conference 2023, Glasgow, UK; Participant at European Seminar on Bayesian Econometrics (ESOBE) 2023, Glasgow, UK.	

SELECTED SHORT COURSES	1$^{\text{st}}$ Oxford Economics Summer School on *Machine Learning* and *Treatment Effects*	Sep 2022
	1$^{\text{st}}$ SGPE PhD Summer School on *Machine Learning for Economists*	Aug 2022
	MITx Certification on *Introduction to Computer Science and Programming Using Python*	Aug 2020

SCHOLARSHIPS & AWARDS	Adam Smith Business School Scholarship (M.Res. & Ph.D.)	2019 – 2024
	Foreign Trade University Academic Scholarships	2014 – 2018
	Third Prize at the Undergraduate Olympiad of Econometrics and Applications	2017

SKILLS	**Programming**: R, MATLAB, Python, Stata, Cpp, Julia, LaTeX, Markdown, CSS, Git, Unix.
	Languages: Vietnamese (native), English (fluent).