COLLIN S. PHILIPPS

<https://sites.google.com/view/csphilipps>
<cphili6@illinois.edu>

UNIVERSITY OF ILLINOIS

Office Contact Information
214 David Kinley Hall
1407 W Gregory Dr
Urbana, IL 61801
+1-(217)-855-3432 (mobile)

Personal Information: Citizenship: United States, Gender: Male

Undergraduate Studies:
   B.S., Economics, Illinois State University (ISU), 2012

Masters Level Work:
   M.S., Applied Economics, Illinois State University (ISU), 2014
   M.S., Mathematics, Illinois State University (ISU), 2015

Graduate Studies:
   University of Illinois, 2015 to present
   Thesis Title: "Essays in Econometrics"
   Expected Completion Date: May, 2020

   Thesis Committee and References:

   Minchul Shin (Chair)
   Research Department
   Federal Reserve Bank of Philadelphia
   Ten Independence Mall
   Philadelphia, PA 19106
   +1-(215)-574-6079
   visiblehand@gmail.com

   Pooyan Amir-Ahmadi
   Department of Economics
   University of Illinois
   1407 W Gregory Dr
   Urbana, IL 61801
   +1-(217)-300-4648
   pooyan@illinois.edu

   Martin Perry
   Department of Economics
   University of Illinois
   1407 W Gregory Dr
   Urbana, IL 61801
   +1-(217)-333-0120
   mkperry@illinois.edu

   David Cleeton
   Department of Economics
   Illinois State University
   Campus Box 4200
   Normal, Il 61790-4200
   (309) 438-8588
   dlcleet@ilstu.edu

Teaching and Research Fields:

   Primary field: Econometrics

   Secondary field: Macroeconomics, Development economics

Teaching Experience:

I have been developing my Economic Forecasting course for three years, and have taught six different courses as primary instructor. I have taught two other courses as a teaching assistant.

My average teaching evaluation score is 4.3/5.

Fall 2019	Econ 475: Economic Forecasting (Undergraduate), UIUC, as Primary Instructor
Spring 2019	Econ 475: Economic Forecasting (Undergraduate), UIUC, as Primary Instructor Econ 105: Principles of Economics (Undergraduate), Illinois State University, as Primary Instructor
Fall 2018	Econ 475: Economic Forecasting (Undergraduate), UIUC, as Primary Instructor
Spring 2018	Econ 475: Economic Forecasting (Undergraduate), UIUC, as Primary Instructor
Fall 2017	Econ 475: Economic Forecasting (Undergraduate), UIUC, as Primary Instructor
Spring 2017	Econ 302: Intermediate Microeconomics (Undergraduate), UIUC, Teaching Assistant for Dr. Bryan Buckley Econ 105: Principles of Economics (Undergraduate), Illinois State University, as Primary Instructor
Fall 2016	Econ 102: Microeconomic Principles (Undergraduate), UIUC, Teaching Assistant for Dr. Jose Vasquez
Spring 2015	Econ 103: Individual and Social Choice (Undergraduate), Illinois State University, as Primary Instructor Econ 238: Using Regression & Econometric Methods (Undergraduate), Illinois State University, as Primary Instructor
Fall 2014	Econ 236: Economics of Energy and Public Policy (Undergraduate), Illinois State University, as Primary Instructor Econ 210: Comparative Economic Systems (Undergraduate), Illinois State University, as Primary Instructor

Research Experience and Other Employment:

2013-2014	Research Associate, Institute for Regulatory Policy Studies (Illinois State University)
2013-2014	Research Assistant for George Waters (Illinois State University)
2012-2013	Research Assistant for Susan Chen (Illinois State University)

Professional Activities

Presentations:

2019	Illinois State University Economics Department Midwest Econometrics Group, 29th Annual Conference

University of Illinois Macro Seminar
2018 University of Illinois Macroeconometrics Seminar (served as chair, 2017-18 and 2018-19 seasons)

Honors, Scholarships, and Fellowships:

2016-19   List of Instructors Rated as "Excellent", University of Illinois, all semesters
2015   Actuarial Society "Best Statistical Project" award, Illinois State University
2014   Scott M. Elliott Graduate Scholarship

Research Papers:

[1] **"When Expectiles are BLUE" (**<u>Job Market Paper</u>**)**

Abstract: We generalize the classical Gauss-Markov framework to incorporate expectile regression. Expectile regression produces the best linear unbiased estimator for regression lines other than the mean in model designs with asymmetric conditional variance of the error term. In some cases where OLS assumptions are violated, an expectile regression estimator is the BLUE for the mean regression. The weighted estimator is also feasible in some cases; we provide an example. The usual unbiased estimator for residual mean squared error may be biased in this application: we suggest an alternative and discuss.

[2] **"Does the Government Spending Multiplier Depend on the Business Cycle"**
with Sebastian Laumer (UIUC)
Abstract: We use a Bayesian smooth-transition VAR model with sign restrictions on orthogonalized and generalized impulse response functions to identify government spending shocks. We find no evidence for large differences in the spending multiplier between expansions and recessions and show that the underlying reason for state-dependence found in the literature is the constant-regime assumption used to create impulse response functions. If the economy starts in a recession, it leaves the recession quickly and ends up in a similar state as if the economy starts in an expansion--with or without expansionary fiscal policy measures. Therefore, there is no reason to believe that the government spending multiplier should depend on the business cycle.

[3] **"Are Forecasters' Preferences Observable?"** with Minchul Shin (Federal Reserve Bank of Philadelphia)
Abstract: We estimate forecasters' loss functions. Given repeated point and density forecasts, the loss functions that rationalize these pairs can be calculated and are sometimes unique. In other cases, no such loss function exists. Forecasters in our sample differ in terms of how rationalizable their forecasts are, and they differ in terms of what loss functions they use. For a given density, forecasters prefer point forecasts near measures of central tendency and prefer the mode over the mean or median of their density forecast.

[4] **"Modifying the Gaussian Kernel for Kernel Density Estimation with Censoring"**
Abstract: We suggest using "realized volatility" as a volatility proxy to aid in model-based multivariate bond yield density forecasting. To do so, we develop a general estimation approach to incorporate volatility proxy information into dynamic factor models with stochastic volatility. The resulting model parameter estimates are highly efficient, which one hopes would translate into superior predictive performance. We explore this conjecture in the context of density prediction of U.S. bond yields by incorporating realized volatility into a dynamic Nelson-Siegel (DNS) model with stochastic volatility. The results clearly indicate that using realized volatility improves density forecasts relative to popular specifications in the DNS literature that neglect realized volatility.

[5] **"Quasi-Maximum Likelihood Estimation for Conditional Expectiles"**

Abstract: We provide three classes of results. First, we characterize the quasi-likelihood functions that may elicit expectiles and find that the family has a unique representation under standard linear regression conditions. The only distribution that elicits expectiles is the the asymmetric normal distribution recently suggested for that purpose. Second, we analyze the quasi maximum likelihood estimator and give conditions for consistency, asymptotic normality, and efficiency. The estimator is unique up to the choice of weights on individual observations, thus it nests the usual GLS family. The optimal estimator uses the inverse of an observation's conditional variance as its weight. Third, we describe the quasi-likelihood distribution itself and present its basic properties. This distribution has the maximum entropy of any distribution with support on the reals and asymmetric conditional mean squared error.
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[6] **"The Aigner et al. MLE is not the Expectile MLE"**
Abstract: This article compares two asymmetric Gaussian likelihood models and their corresponding estimators. There has been confusion in the literature regarding these models and (1) whether they are the same, or (2) whether both of them can be used to estimate expectiles. After the comparison, it becomes clear that they are not the same and only one of these models is appropriate for that purpose. The Aigner et al. MLE is an inconsistent estimator of the chosen expectile and the similarity between these models is purely superficial.

Computation Skills: MATLAB, EViews, Python, R, Stata

Languages: English (Native)