Prajyna P. Barua

Email | LinkedIn

+1 201-850-9213

My research lies at the intersection of macroeconomics and labor economics, with specific focus on understanding the dynamics of the U.S. labor market. In particular, my research focuses on examining the factors affecting the shifts in the U.S. Beveridge Curve both at aggregate and industry level and contribute to the growing literature of labor market frictions and labor market flows. My primary research area is empirical macroeconomics and time series analysis, with secondary focus on Bayesian econometrics and econometrics. In general, my research approach is guided by asking seemingly simple but fundamental questions that explain movement in the most important macroeconomic variables—because even the simplest questions often demand deep analytical thinking and sophisticated empirical methods.

My dissertation consists of three chapters. My first chapter is my job market paper, titled '***Estimating time-variation in matching efficiency and match elasticity for the US labor market***' where I study how labor market frictions evolved over time for the U.S. non-farm sector. In the paper, I estimate the time varying matching efficiency using a state space model. I find evidence for significant time variation in matching efficiency which experienced a gradual decline, indicating growing labor market inefficiencies. Matching efficiency reflects the productivity of the process through which jobs are matched to job seekers. I find matching efficiency to be pro-cyclical, which can be attributed to increased reallocation of workers between industries and higher composition of non-degree workers in the unemployed pool during the Great Recession. The paper contributes to the literature by finding evidence of explaining matching efficiency using CPS data. For COVID-19, factors such as reallocation and composition are not significant. The paper also estimates unemployment gap using models with and without time variation and find counter intuitive gaps when time variation is not accounted for. Therefore, the paper provides new insights on the shifting of the Beveridge Curve and highlights the importance of incorporating the micro-level data into macro-labor models.

My second chapter is titled ***'Understanding the unemployment dynamics'***, where I revisit unemployment dynamics over the period 2003–2024, both in aggregate and across industries, using micro-level CPS data from IPUMS. I find that transitions from non-participation to both employment and unemployment play an important role. During the Great Recession, the increase in unemployment reflected both stronger inflows into unemployment (from employment and the labor force) and weaker outflows into employment. In contrast, during COVID-19, the sharp increase in unemployment was driven almost entirely by higher inflows from employment into unemployment. The relative importance of different flows for the cyclicality of unemployment also shifted over time, reflected both at aggregate and industry level. Between 2006 and 2012, job separations and job-finding rates had effects of comparable magnitude. However, in the subsequent period countercyclical separations became the dominant driver of cyclical fluctuations in unemployment, while the role of job finding diminished. Finally, the variation in the transitions from nonparticipation to unemployment accounted for 15–20% of the cyclical variation in the unemployment rate between 2013 and 2024. Combining the conclusion of chapter 1 and 2, I find that the shift in the Beveridge Curve during the Great Recession was driven by both inflows and outflows (affected by decline in matching efficiency) while the shift in the Beveridge Curve was mainly due to increase in job separations and therefore the Beveridge Curve shifted back. The paper also finds lots of heterogeneity across industries and suggests that the relative importance of inflows has changed over time, especially after COVID.

Third chapter is titled ***'Estimated ouput gap in a wage-inflation expectations model'*** is joint work with Azharul Islam, Irina Panovska and Srikanth Ramamurthy. We study how incorporating adaptive learning-based inflation expectations for price and wage inflation can improve the performance of Unobserved Components (UC) models for estimating the output gap. We estimate output gap under bivariate adaptive learning process which allows feedback between wage and price inflation under New Keynesian Phillips Curve framework, augmenting a conventional reduced-form UC model for output and unemployment with this bivariate learning process. Three interesting sets of results stand out. First, our model captures turning points and the business cycle amplitude accurately, especially when compared to models with univariate learning that do not incorporate labor market data. Second, while the perceived persistence of inflation fell during the early stages of the pandemic, it increased sharply and substantially 2021-2023. While it declined after 2024, it remains at an elevated level when compared to the pre-COVID period. Finally, we find that the cross-effects of wage and price inflation vary substantially over time. Central to this dissertation is understanding factors affecting unemployment rate and how inclusion of unemployment rate improves the estimation of output gap.

In another project that builds on my work on Beveridge curves, I collaborated with Luis Fernando Colunga-Ramos,

Irina Panovska, Miroslava Quiroga-Trevino and B. Elam Rodríguez-Alcaraz, titled '***Mexico's Labor Market through the Lens of the Beveridge Curve***' . This paper is a Bank of Mexico working paper. In this project we present the first Beveridge Curves for Mexico and its regions, constructed from a newly compiled dataset on job vacancies. Building on the vacancy–unemployment relationship that defines the Beveridge Curve, we also develop the measure of labor market slack for Mexico—the vacancy-to-unemployment (V/U) ratio for a longer period and at the regional level —which we use to analyze the relationship between labor market conditions and inflation. Furthermore, by incorporating vacancy data into a Structural Bayesian VAR, we identify key structural labor market shocks and explore their role in business cycle dynamics. Our results indicate that the Beveridge Curve fluctuations are largely driven by labor market shocks: unemployment dynamics reflect labor supply and matching efficiency shocks, while wage bargaining shocks explain most of the variation in vacancies at the national level, with marked heterogeneity across regions.

In the future, I plan to deepen my research on the dynamics of unemployment. Specifically, I aim to examine how time variation in labor market matching efficiency influences inflation dynamics within a New Keynesian DSGE framework. Extending my work on unemployment dynamics, I plan to provide a structural framework to decompose the variation in unemployment, incorporating lag distribution. Building on this line of inquiry, I also intend to extend my work on forecasting unemployment rates—both at the aggregate and industry levels—by utilizing transition probabilities, as recent studies suggest that incorporating flow-based measures enhances the accuracy of unemployment forecasts. Furthermore, I plan to expand my joint work on Mexico's Beveridge Curve by constructing counterfactual unemployment paths to quantify the extent and sources of observed shifts. Lastly, I am also interested in exploring the potential economic benefits for African countries that are members of the West African Economic and Monetary Union, particularly in terms of economic growth and stability.