Addressing Misclassification in the Estimation of Labor Market Transitions

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Abstract

Transition probabilities across labor market states are a key piece of information to track the performance and evolution of the labor market and to inform the development and assessment of aggregate models of the labor market. The goal of this paper is to compare the cyclical behavior of aggregate transition probabilities across employment, unemployment and non-participation since the 1980s until today across a set of large European countries. More specifically, we want to establish new facts on the role of fluctuations in transition probabilities between non-participation and unemployment to the dynamics of unemployment over the business cycle. For that purpose we decompose the short-run variation of the unemployment rate based on a three-state Markov-chain model using the dynamic variance decomposition developed by Elsby et al. [2015].

Our analysis is based on microdata from the European Union Labor Force Survey (EULFS). The main advantage of these data is the consistency of definitions of labor market concepts across countries and the availability of fairly long longitudinal dimension at an annual frequency. Before we can move on to the more substantive contributions of the paper, we need to address various challenges in the estimation of transition probabilities across labor market states based on the definitions of the International Labor Organization (ILO).

The main challenge we face is measurement error in individuals' past labor market state based on the ILO definitions. The EULFS records information on the current labor market state based on the ILO's definitions, but the information on individuals' past (one year ago) labor market state is self-reported, and therefore in general different from the ILO classification. To address this problem, we explore the fact the EULFS also records individuals' self-reported labor market state in the current period. Specifically, we combine the two different measurements of individuals' current labor market state to estimate misclassification probabilities.[1]

Our approach works in two steps. First, we use the mapping between the ILO-based and self-reported measurements of labor market state to estimate individual-level misclassification probabilities. We use a multinomial logit framework to model the dependency between misclassification probabilities and individual-level characteristics (not only demographics but also variables pertaining to the quality of the interview). Our motivation for this first step is found in evidence of survey re-interview data, which shows that probability of misreporting varies significantly across individuals (see e.g. Poterba and Summers [1986]). Second, we follow the literature on labor market flows (see e.g Darby et al. [1985] and Blanchard and Diamond [1990]) and assume a first-order Markov-chain model to describe the evolution of labor market stocks.

Our approach builds on previous work by Poterba and Summers [1995] and Pfeffermann et al. [1998] based respectively on data from the Current Population Survey and the Panel

[1] Although most European countries' labor force surveys used to inform the EULFS are based on a rotational structure, the EULFS does not provide information on longitudinal identifiers in the micro datasets.

Study of Income Dynamics. Our main contribution is to extend their approach to estimate transition probabilities addressing the type of misclassification error present in the EULFS. In addition to addressing misclassification, we also deal with a number of measurement issues common in the labor flows literature. First, we address margin error, i.e. the fact that estimated transition probabilities are potentially inconsistent with the aggregate stocks of workers in each labor market state, using a penalized likelihood approach. We show that standard approaches to deal with misclassification and margin errors produce implausible estimates of transition probabilities. Second, we deal with time aggregation bias using a continuous-time correction method developed by Shimer [2012].

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