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## *Discussion*

Andrew Atkeson opened the discussion by noting that the model mechanically violates Gibrat's law. In the model, large firms lose workers proportionally to the stock of workers but attract new workers only at a constant absolute rate. In this way, he said, the model produces differential wage-setting behavior in small and large firms. Atkeson pointed out that this will mechanically run afoul of Gibrat's law, and even though he does not necessarily believe in Gibrat's law, he would want a mechanical theory of firm dynamics that has the potential to be consistent with it. Moscarini responded by noting that if a Gibrat's law regression were taken over the averages of the business cycle, one would get a close to zero correlation between firm size and firm growth as Gibrat's law predicts. Since growth is negatively correlated with size earlier in the business cycle and positively correlated later, the average correlation would be close to zero. He also pointed out that the intuition of why large firms behave differently than small ones is richer than the basic mechanics outlined by Atkeson. In particular, the basic objective function of the firms is supermodular in productivity and wages. A bigger firm will have larger incentives to retain workers since each worker is valuable. A more productive firm will also have larger incentives to retain workers because of constant returns to scale combined with higher-value workers. Thus, bigger firms will offer higher wages, even in the case of firms that are homogeneous in productivity.

Robert Shimer then pointed out that another mechanism in the model to make large firms get larger is that the authors assume that larger and more productive firms actually attract workers at a faster rate than smaller firms. Moscarini responded with a comment that this is a reasonable assumption that would be achieved in a standard model with convex vacancy costs. Higher-productivity (and thus higher-profit) firms that face convex costs for posting vacancies will choose to post

more vacancies than lower-productivity firms. They will therefore attract workers at a faster rate.

Michael Woodford brought up the role of the back-loading of wages. A feature of Moscarini and Postel-Vinay's model is that wage commitments are reset for everyone after a shock occurs. Without restriction to constant wage offers, this feature ends up allowing the back-loading of wages. Woodford pointed out that there could still be back-loading in a slightly altered, and perhaps more reasonable, model. Specifically, assume that a commitment of a wage path is made for an individual when first hired that will last for as long as that particular employment relation stays. Then back-loading could still exist without the feature that everyone's wage path was reset at the same time. Woodford wondered whether the assumption that these wages are reset for everyone is a critical element of the way the model works. Moscarini said that the back-loading the authors have in their model is at the establishment level; things would certainly change if the assumption that all workers are paid the same were relaxed. However, he believed that the back-loading at the establishment level is critical to the labor movements in the paper. When unemployment is high, the workers are coming for free; but when unemployment declines, the firms need to raise the shadow value of the wages of older workers. Once large firms do this, the small firms respond. He pointed out that, in this model, smooth wage back-loading is achieved without risk aversion, thus producing a different notion of back-loading than in standard search models.

Olivier Blanchard asked if there might be other reasons that small and large firms are different. He would have thought that small firms often work for large firms; for example, if the last recession was largely caused by shifts in demand initially to the large firms, then it would seem that large firms would be affected before small firms mechanically. If there were a relatively reliable lag structure such as this one, it would be important to take it into account when looking at the facts. Moscarini mentioned an empirical fact not addressed in the paper, which is that in recessions larger firms tend to take bigger hits. If both firms worked together, he would expect to see more comovement. This fact made him skeptical of the story that small firms are related to large firms in this way.

Daron Acemoglu began a discussion of the overall relevance of this paper in the business cycle literature. He wondered what the right set of first-order economic issues were to think about when studying employer-to-employer (EE) labor flows. From a labor economics perspective, it seems that the interesting issues might lie in the careers of young workers.

Most young workers in the U.S. labor market change a lot of jobs, and there is evidence that these are productive changes. It might be more generally true that young workers are learning about what jobs they are good at and what types of employers they will get along with as they transition from job to job. Perhaps one way of reading these facts is that business cycles are either interfering or facilitating this reallocation of workers toward tasks in which they are more efficient. Moscarini agreed that this might be a relevant issue. However, he pointed out that it is not obvious that the learning issues that Acemoglu brought up are related to firm size, so he thought it is possible that the learning aspect of EE transitions is an issue orthogonal to those discussed in the paper.

Susanto Basu followed up with an open-ended question about how one should think about the cyclical behavior of the labor market differently depending on how the issues are resolved between the authors and the discussants. Moscarini's recommendation was to use the share of employment of large firms as one of the variables in structural vector autoregressions, since this variable is a good predictor of wage growth. This model provides a story for why this would be. Shimer, however, highlighted the potential for understanding the cost of business cycles, since a feature of this model is that business cycles reduce the reallocation of workers to where they should be.

Finally, Robert Hall noted that, when thinking of EE transitions, what matters in this model is whether the worker retains the option of staying in the current job. There is a separate distinction between whether a worker has quit or been laid off, and the quit numbers in the Current Population Survey (CPS) include layoffs to some degree, since many people know ahead of time that they will be laid off and then head directly to a new job. In fact, in a number of studies, about a half of people in mass layoffs immediately move to new jobs. Given this, Hall wondered whether there was any connection between the CPS measure of transitions and the conceptually correct one that Moscarini had identified. Moscarini thought that, if anything, this incorrect CPS measure would mechanically dampen the volatility of measured EE transitions and thus might explain the perceived small volatility in the data.

