

Uncertainty and the Slow Labor Market Recovery: Technical Appendix

By Sylvain Leduc and Zheng Liu

This appendix provides technical details for *FRBSF Economic Letter* 2013-21.

<http://www.frbsf.org/economic-research/publications/economic-letter/2013/july/us-labor-market-uncertainty-slow-recovery/>

The Beveridge curve, which describes the inverse relationship between unemployment (u) and the job vacancy rate (v), can be derived from a general matching function of the following form (see Pissarides 2000, chapter 5):

$$(1) \quad m_t = \mu (s_t u_t)^\alpha (a_t v_t)^{1-\alpha},$$

where m_t denotes new matches (hires) being formed, μ is a scale parameter capturing (true) match efficiency, s_t denotes the search intensity of unemployed workers, and a_t denotes firms' recruiting intensity (for example, advertising).

Imposing the steady-state relation that $m = \delta(1 - u)$, where δ denotes the job separation rate, we obtain the expression for the Beveridge curve

$$(2) \quad v = \Omega^{\frac{1}{1-\alpha}} (u^{-\alpha} - u^{1-\alpha})^{\frac{1}{1-\alpha}},$$

where $\Omega \equiv \delta / (\mu s^\alpha a^{1-\alpha})$.

The term Ω is a reduced-form representation of all factors that can shift the Beveridge curve. We call Ω the "Beveridge curve shifter." An increase in Ω leads to an outward shift in the Beveridge curve.

We construct a time series for Ω using data for vacancies and unemployment, based on the Beveridge curve relation in equation (2), where α is set to 0.5 following the literature and the job separation rate δ is taken from the Job Openings and Labor Turnover Survey (JOLTS) of the U.S. Bureau of Labor Statistics.

To examine the effects of policy uncertainty on Ω , we estimate a four-variable vector autoregression (VAR) model that includes policy uncertainty, unemployment, vacancy, and the time series measure of Ω . We identify an uncertainty shock using a Cholesky scheme in which we order the uncertainty measure first. (Our results are similar if we instead order uncertainty last in the VAR.)

Reference

Pissarides, Christopher. 2000. *Equilibrium Unemployment Theory*. Cambridge, MA: MIT Press.