



Eurosclerosis and international business cycles[☆]

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ABSTRACT

This paper incorporates search frictions with endogenous job creation and destruction into a two country dynamic stochastic general equilibrium model to explain two macroeconomic facts. First, since the 1980s, European unemployment rates have risen substantially above USA levels. Second, the European business cycle has lagged the USA business cycle during the period of the Great Moderation. In the model, more generous unemployment benefits and greater employment protection (manifested as firing costs) can endogenously generate higher unemployment. These same policies will also create labor market frictions which slow the response of the economy to business cycle conditions.

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1. Introduction

During the 1980s, many continental European countries began to display much higher rates of unemployment relative to the United States (see [Ljungqvist and Sargent, 1998](#); [Bertola and Rogerson, 1997](#); [Blanchard and Wolfers, 2000](#)). Frictional unemployment is a function of the average rate of job finding and separations from employment. Each of these behave very differently in the US and Europe. European workers are less likely to join the ranks of the unemployed than American workers ([Elsby et al., 2013](#); [OECD, 1997](#); [Reichling, 2005](#)). At the same time, unemployed European workers are relatively less likely to find a new position in any period (see [Hobijn and Sahin, 2009](#); [Ridder and van den Berg, 2003](#)). The net effect is higher average unemployment in the Eurozone during the period of the Great Moderation.¹ The OECD reports quarterly harmonized unemployment rates for the European Monetary Union from the 3rd quarter of 1990. The mean unemployment rate for the EMU during the period 1990–2007 is 9.1%. Over the same period, the unemployment rate for the United States is 5.4%.

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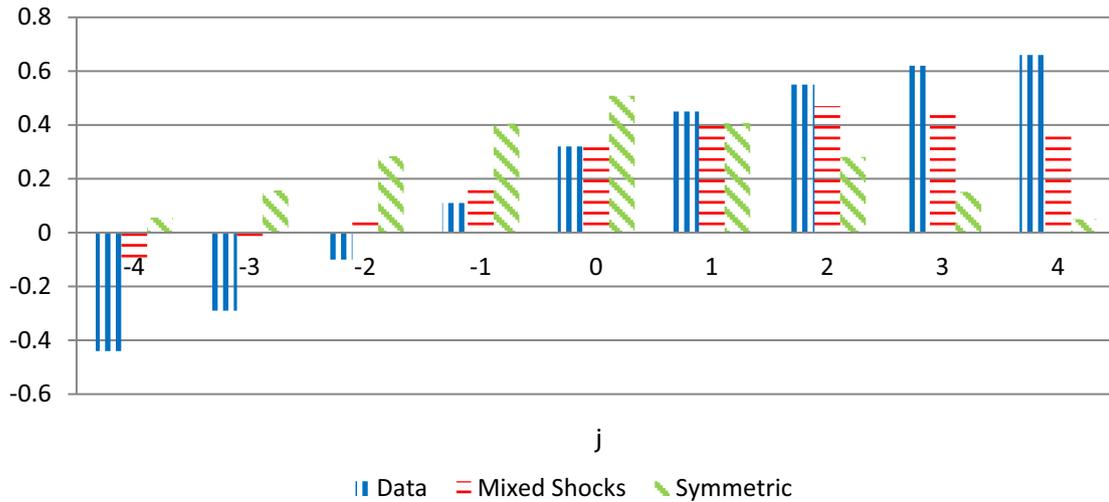
¹ We focus on the period of the Great Moderation ending the data prior to the financial crisis of 2008 during which contemporaneous co-movement between Europe and the United States was high. During the period of the Great Recession, the US economy moved into a liquidity trap. [Cook and Devereux \(2011\)](#) show that international comovement is quite different at the zero lower bound than at normal times.

[Kang \(2011\)](#) identifies the leading role of US output and employment relative to other developed economies at business cycle frequencies. This paper focuses on the dynamics of unemployment in the Eurozone and the United States during the Great Moderation. [Fig. 1](#), Panel A shows the cross-correlogram of unemployment between the EMU and the USA over the period 1990:3–2007:4. The moderately positive contemporaneous correlation of 0.32 is smaller than the dynamic correlation of USA unemployment with EMU unemployment observed one year in the future which is near 0.6. The correlation of the current USA unemployment with EMU unemployment observed one year previously is negative, near -0.4 . Panel B shows the cross-correlogram of the USA and EMU Hodrick–Prescott detrended real GDP over the period 1984:1–2007:4. Panels A and B show a similar pattern with a contemporaneous correlation of the output gap equal to .28; the correlation between the USA output gap and the EMU output gap one year later is near .5 and a negative correlation below $-.25$ with EMU output one year earlier.² [Kang \(2011\)](#) and [Wen \(2004\)](#) argue that cross-country differences in business cycle dynamic frictions can be explained by differing labor market frictions.

Our model focuses on explicitly modeling search frictions (see [Mortensen and Pissarides, 1994](#)) which we show can quantitatively explain both high average European unemployment rates and the slow adjustment of European unemployment rates. We construct a dynamic general equilibrium model with search frictions in labor markets and endogenous job destruction (following [Den Haan et al., 2000](#),

² [Heathcote and Perri \(2013\)](#) find that in a period characterized by increasing globalization international business cycle co-movement fell substantially. However, even during this period, the dynamic correlation between the USA and EMU GDP was still quite strong with the US economy playing a leading role.

(A) Correlation of USA Unemployment Rate with EMU Unemployment Rate in j periods later



(B) Correlation of USA Output with EMU Output in j periods later

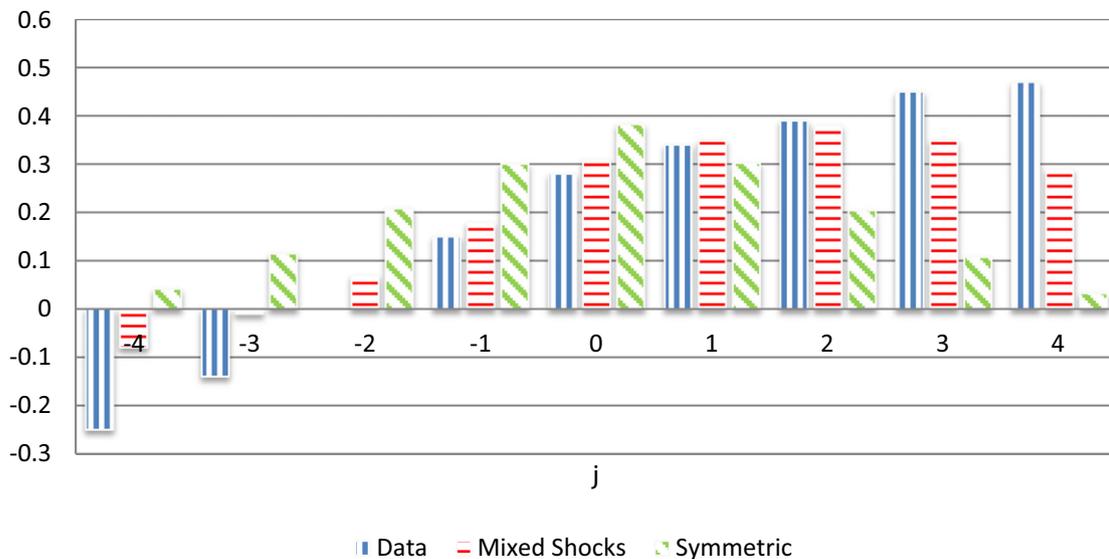


Fig. 1. The figure shows the cross-correlogram of the detrended US and EMU unemployment rates (Panel A, 1990:3–2007:4) and the US and EMU output gaps (Panel B) in the data and in the model (Symmetric case and the Mixed Shocks case). Each correlation in variable X is X_t^{USA} and X_{t+j}^{EMU} .

and ultimately Mortensen and Pissarides, 1994).³ A key advantage of labor market search models is that the dynamics of aggregate adjustment can be calibrated using direct observation on micro-level labor market flows. In our model, the structure of European employment flows and the aggregate dynamics of European unemployment can be simultaneously explained by a combination of policy choices: generous European unemployment benefits and greater levels of employment protection which create costs for firms that destroy jobs. The argument

that firing costs are higher in the Eurozone is consistent with evidence accumulated by the OECD that measures of employment protection are much higher in continental Europe than in the USA (see Venn, 2009). We allow for differences in the income of the unemployed consistent with evidence that unemployment benefits are higher in continental Europe than in the USA (see OECD, 2007).

We incorporate labor market search frictions in a two country international business cycle model in which one economy features a job flow structure similar to the United States and one economy features a structure similar to the Eurozone. Hairault (2002) has previously shown that international business cycle models with symmetric search frictions feature more realistically positive international co-movement driven by technology shocks than do models with Walrasian labor markets. In our model, we find that the more rigid nature of European labor

³ Shimer (2012) presents evidence that endogenous job separations are unimportant to cyclical unemployment volatility in the USA. Fujita and Ramey (2007, 2009) argue that cyclical job destruction to macroeconomic shocks should not be ignored. Our model explains the large difference between Europe and the US in job separation rates as the result of policy differences, requiring the modeling of endogenous job destruction.

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