The cause of Danish unemployment: Demand or supply shocks?*

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Abstract. We study the Danish unemployment experience 1905–92 using a common trends model with cointegration constraints. To justify the identifying assumptions about the cointegration vectors and the common trends we present a simple macroeconomic model of the labor market. The model determines the long run behavior of labor productivity, employment, unemployment, real product and real consumer wages. The empirical results give support for three cointegration relations and two common trends. Based on the economic model the trends are interpreted as representing labor productivity (technology) and labor supply. With unemployment being nonstationary, the common trends analysis indicates that labor supply shocks is the primary source for explaining the behavior of unemployment.

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1. Introduction

A fundamental problem in economics is to explain the behavior of unemployment. One of the first and most influential empirical results was the negative correlation between wage inflation and unemployment recorded by

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Phillips and others. At the time, many economists interpreted this as depicting a tradeoff between inflation and unemployment.

The experiences of most Western European countries since the 1970’s has lead many economists to question not only the existence of a tradeoff (which can be utilized by policy makers), but also the (“Keynesian”) view that unemployment is a purely cyclical phenomenon. As a response, there has been a change of focus in the literature from the Phillips curve towards a relation between the level of the real wage and unemployment, and towards the determinants of the natural (equilibrium) rate of unemployment.

One of the most influential empirical papers, focusing on the relation between unemployment and wage levels, is the comparative study of 18 OECD countries by Bean et al. (1986). By analyzing error correction models for real wages and employment Bean et al. find that changes in labor demand and supply are about equally important in explaining excess supply of labor. Moreover, labor markets seem to adjust faster to different types of shocks in countries that are more corporatist in nature (such as the Nordic countries) and these countries often show strong long run effects of unemployment on wages.\(^1\)

The single (and two) equation(s) error correction approach to analyzing the labor market has been challenged in two recent papers by Jacobson, Vredin, and Warne (1997, 1998). They point out that some of the variables which are taken as exogenous by Bean et al. (1986) should be treated as endogenous. Once labor productivity and the labor force are modelled jointly with employment and real wages, Jacobson et al. find evidence (on Scandinavian data) suggesting that the high perceived elasticity of real wages with respect to unemployment reflects that unemployment reacts faster and much less to transitory labor demand shocks than real wages, and that there is no strong evidence of a long run relation (in terms of a common permanent shock) between these two variables.

In this paper we follow the proposal made by Jacobson et al. (1997, 1998) and analyse a small macroeconomic model of the labor market in which all variables of interest are treated as endogenous. We extend the model discussed in Jacobson et al. by including a relation for the ratio of consumer to producer prices. This allows us to take into account that consumers and producers are concerned with different real wage measures.

In the empirical analysis we use long time series of annual data (1905–1992) from Denmark. We focus our attention on the responses in unemployment, real wages (for consumers and producers), and the real unit labor cost (the wage share) to changes in certain shocks. Our interest in the wage share is governed by the frequent empirical finding of cointegration between unemployment and the wage share.\(^2\)

The main result of the empirical analysis is that labor supply shocks seems to be the main determinant of unemployment, and that unemployment falls following positive supply shocks. This means that part of the Danish unemployment problem may be caused by a decrease in the labor supply (measured in hours). In contrast, real wages are mainly influenced by productivity shocks

\(^1\) A large number of papers followed the study by Bean et al. (1986); for surveys, see e.g. Bean (1994) and Elmeskov (1994).

\(^2\) See e.g. Drèze and Bean (1990) where the wage relations for 5 out of 10 countries are error correction models in which the wage share and unemployment enters in the error correction term.