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Gradual wage-price adjustments, labor market frictions and monetary policy rules

Christian R. Proaño

The New School for Social Research, 6 East 16th Street, Rm. 1113, 10003 New York, NY, United States

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ABSTRACT

In this paper the role of different types of labor market frictions in the dynamics of output and inflation is investigated. For this purpose, the Keynes–Goodwin model discussed in Chen et al. (2006) and Franke et al. (2006) is extended by a labor search and matching module along the lines of Mortensen et al. (1994). After estimating the resulting model with U.S. aggregate time series and comparing its dynamics with those of a VAR model, the performance of different types of monetary policy rules for inflation, and more generally, for macroeconomic stability is analyzed.

1. Introduction

It is widely acknowledged that in the real world labor markets are characterized by a variety of frictions such as the asymmetric or incomplete information about the quality of the market participants, the existence of geographical and skill mismatches, as well as of labor searching and trading costs. As pointed out by Pissarides (2000, p. 3), trading in labor markets is likely to be – to a greater extent than in other markets – "uncoordinated, time-consuming, and costly for both firms and workers", itself likely to depend on the actual market conditions such as the relative size of unemployed workers and vacancies.

In the New Keynesian models developed in the last two decades, however, the existence of nominal rigidities was considered as the primary source of welfare losses. In those early frameworks these nominal frictions were commonly specified by means of a staggered price (and lately also a wage) setting mechanism, e.g., à la Calvo (1983), whereafter only a fraction of firms (and concerning wages, households) could reset their goods prices to the monopolistically optimal level in every period, see, e.g., Blanchard and Kiyotaki (1987), Roberts (1995), Goodfriend and King (1997), and more recently Erceg et al. (2000). The labor search and matching process was however still assumed to function in a frictionless manner, so that firms and workers always (and costlessly) were able to find proper counterparts, what in turn ruled out the existence of non-Walrasian labor market equilibrium situations – where involuntary unemployment and open vacancies might exist in equilibrium due to external factors.

This important shortcoming of the early New Keynesian literature was recently addressed by Walsh (2003, 2005), Christoffel et al. (2009), Gertler and Trigari (2009) and Trigari (2009), among others, through the incorporation of real

E-mail addresses: christian.proano@gmail.com, christian.proano@web.de

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labor market frictions into New Keynesian DSGE models with nominal rigidities using the search and matching approach developed by Mortensen et al. (1994) and Pissarides (2000). However, while this new modeling direction seems to add a significant touch of empirical relevance to the DSGE theoretical construct, it does not remedy the lack of realism of its main building block: The representative agent type of microfoundations – which makes central issues of capitalist economics such as the income distribution conflict irrelevant (see, e.g., Flaschel (2009, chap. 1)) –, and the rational expectations assumption – which knowingly leads to "dynamic inconsistencies" between the predicted model dynamics and the observed empirical stylized facts, as pointed out by Mankiw (2001), Estrella and Fuhrer (2002), and Rudd and Whelan (2005), among others.

In the alternative approach discussed, e.g., in Chiarella and Flaschel (1996) and Chiarella et al. (2005), in contrast, the dynamics of the economy are not the equilibrium outcome of an intertemporal utility and profit maximization problem of a representative agent with "mathematically rational" expectations. Instead, they are explained by the gradual adjustments of nominal and real variables to disequilibrium situations in the goods and labor markets, and thus by the implicit assumption of heterogeneous and boundedly rational agents which in their aggregate give rise to such rather smooth processes.

The main aim of this paper is to incorporate the main elements of labor search theory used in recent New Keynesian models into this disequilibrium approach to macroeconomic dynamics in order to analyze, among other things, the conduction of monetary policy in such an environment. For this purpose, the (Disequilibrium) Keynes–Goodwin model discussed in Chen et al. (2006) and Franke et al. (2006) – where the dynamics of the goods and the labor markets were linked by a dynamic version of Okun's (1970) law – is extended by the incorporation of a labor search and matching module along the lines of Mortensen et al. (1994) and Pissarides (2000).

The remainder of this paper can be summarized as follows. In Section 2 the theoretical framework is discussed. In Section 3 the empirical plausibility of the resulting model is investigated first by estimating it using aggregate U.S. time series data, and then by comparing the model dynamic adjustments with the ones of an unrestricted VAR model of the U.S. economy. A closer look on the role of labor market frictions for the transmission of monetary policy shocks is taken in Section 4, where the performance of alternative monetary policy rules is also investigated. Finally, Section 5 draws some concluding remarks from this study.

2. The model

2.1. The goods and labor markets

The dynamics of the goods markets in this theoretical model are assumed to be of a "Keynesian" type, with aggregate demand driving the level of output ($Y_t^{\mathrm{D}} = Y_t$) and the employment level (as well as the labor productivity) being determined accordingly in a second step.

In order to keep the model as simple as possible, let us assume a linear single input factor technology by which output is produced according to

$$Y_t = z_t N_t, \tag{1}$$

where N_t denotes the actual (realized) level of employment and z_t represents the average labor productivity level.

Analogously, the full employment output level Y_t^f is assumed to be determined by

$$Y_t^f = z_t^{\mathrm{T}} L_t \tag{2}$$

where L_t is total labor supply in the economy and z_t^{T} is the trend labor productivity level.

As it is standard in the literature, see, e.g., Rudebusch and Svensson (1999) the output gap $y_t = \ln(Y_t^{\mathrm{D}}/Y_t^f)$ (a measure of the excess aggregate demand in the economy) is assumed to be determined by

$$y_t = \alpha_y y_{t-1} - \alpha_{yr}(i_{t-1} - \hat{p}_t - (i^o - \pi^o)) - \alpha_{yv} \ln\left(\frac{v_{t-1}}{v^o}\right), \tag{3}$$

where y_{t-1} represents the output gap in the previous period, i^o denotes the steady state nominal interest rate, $\hat{p}_t$ the price inflation rate at date t, and π^o the steady state inflation rate.[1] Additional to these standard terms $\ln(v_t/v^o)$, the log deviation of the actual labor share v_t from its steady state level v^o is also included in the above equation to explicitly incorporate the role of functional income distribution for the dynamics of the output gap.[2] According to Eq. (3) aggregate demand is thus assumed to depend (i) positively (with $0 < \alpha_y < 1$) on aggregate income, (ii) negatively on the real interest rate, and (iii) negatively on the labor share.

[1] Throughout this paper, the growth rate of a variable x_t will be denoted as $\hat{x}_t$.

[2] In the heterodox macroeconomics literature, the case where economic activity depends negatively on wage share is referred to as a "profit-led regime", in contrast to the "wage-led" case where the economy depends positively on the wage share, see, e.g., Barbosa-Filho and Taylor (2006). On the basis of this study, as well as of the empirical findings by Chen et al. (2006), Franke et al. (2006), Proaño et al. (2006), and Proaño (2009), aggregate demand will be assumed in this paper to be profit-led.