



An open-economy new Keynesian Phillips curve for the U.K. ☆

Nicoletta Batini^{a,*}, Brian Jackson^b, Stephen Nickell^c

^a*HQ 10-612H Research Department, International Monetary Fund, Washington, DC 20431, USA*

^b*Federal Reserve Bank of New York, New York, NY, USA*

^c*London School of Economics and Monetary Policy Committee of the Bank of England, London, UK*

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Abstract

We estimate a pricing equation or “new Keynesian Phillips curve” (NKPC) obtained from a structural dynamic model of price setting based on Rotemberg [1982. Sticky prices in the United States. *Journal of Political Economy* 90(6), 1187–1211] and extended to capture employment adjustment costs and the openness of the United Kingdom. This model nests the baseline Galí and Gertler [1999. Inflation dynamics: a structural econometric analysis. *Quarterly Journal of Economics* 110, 127–159] and Sbordone [2002. Prices and unit labor costs: a new test of price stickiness. *Journal of Monetary Economics* 49, 265–292] relationship between inflation and marginal cost in the limiting case of no employment adjustment costs, no impact of relative prices of imported inputs on real marginal cost and a constant equilibrium markup. Our findings indicate that each of our modifications to the baseline NKPC model is important for U.K. data, so that inflation in the U.K. is explained both by changes in employment and by changes in real import prices, in general, and real oil prices, in particular. External competitive pressures also seem to affect U.K. inflation via their impact on the equilibrium price markup of domestic firms.

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*Corresponding author. Tel.: +1 202 623 8568; fax: +1 202 623 6343.

E-mail address: nbatini@imf.org (N. Batini).

1. Introduction

In this paper we explore the theoretical and empirical relationship between the share of labour, which in a Cobb–Douglas world is proportional to real marginal cost, and inflation in the U.K. in the spirit of the New Keynesian Phillips Curve (NKPC). In its simplest form, the NKPC relates log deviations of inflation from steady state to expected inflation and real marginal cost (see Galí and Gertler (1999), ‘GG’ hereafter, and Sbordone (2002)). In particular, we examine whether the labour share can be regarded as a good indicator of U.K. inflationary pressures, and, more broadly, we speculate about the future implications for inflation of the rise in the share observed since 1995.

Our main points of departure from the baseline NKPC model are three. First, we allow variations in the equilibrium price markup due to external competitive pressures. Second, we account for the cost impact of changes in material input prices when the production function takes a general form. Both these modifications are meant to account for the fact that the U.K. is an open economy. Finally, in line with Rotemberg (1982) and Layard et al. (1991) (LNJ), our framework accounts not only for price but also for employment adjustment costs. These theoretical extensions to the baseline NKPC model are presented in Section 2. In Section 3 we estimate our theoretically derived pricing model by using a generalised method of moments estimator. We find a stable relationship, which implies that the measure of labour share that we employ contains information that is helpful to predict inflation. Importantly, our empirical evidence indicates that each of our modifications to the baseline GG (1999)/Sbordone (2002) NKPC model is important for U.K. data, so that inflation in the U.K. is explained both by changes in labour adjustment costs and by changes in relative prices of imported intermediate inputs, including oil prices. Concluding remarks follow.

2. The relationship between the labour share and inflation

To unveil the relationship linking inflation and the share of labour, we need a model of the pricing behaviour of firms. For this purpose we assume that the economy is inhabited by F identical firms, labelled i , and that technology is Cobb–Douglas, that is, $Y_{i,t} = A_{i,t} N_{i,t}^\alpha$ where $\alpha > 0$, $Y_{i,t}$ is value added output, $N_{i,t}$ is employment and $A_{i,t}$ represents an exogenous productivity index capturing shifts in labour productivity. Following LNJ (1991),¹ we also assume that firms wish to maximise a real profit objective, but that they face additional quadratic adjustment costs of changing both prices and employment—a specification based on Rotemberg (1982). As we will discuss shortly, employment adjustment costs are a crucial source of the inertia usually observed in the U.K. and hence should not be ignored. When these are included, the representative firm’s problem consists in deriving, at the start of period t , a price and employment path that solve:²

$$\min E_{t-1} \sum_{s=0}^{\infty} \phi^s [(p_{i,t+s} - p_{i,t+s}^*)^2 + b_p (p_{i,t+s} - p_{i,t+s-1})^2 + b_n (n_{i,t+s} - n_{i,t+s-1})^2], \quad (1)$$

where ϕ is a discount factor, and E_{t-1} denotes expectations formed on the basis of information available at the end of period $t-1$. p_i^* is the log of the static equilibrium price,

¹See LNJ (1991, pp. 346–348).

²Throughout, lower-case letters denote natural logarithms of the corresponding upper-case variables.

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