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PRESS RELEASE

Firm-specific production factors in a dynamic stochastic general equilibrium model with Taylor price setting

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The New Keynesian Phillips curve, relating inflation to current and expected future marginal costs, has become a popular tool for monetary policy analysis. However, the various attempts to estimate the elasticity of inflation with respect to changes in the marginal cost have typically resulted in very small figures. Since the latter elasticity is negatively related to the nominal price stickiness, these low estimates imply an implausibly high degree of nominal price rigidity. Indeed, the estimated elasticities suggest that firms reoptimise their price about every ten quarters on average. This is clearly at odds with existing microeconomic evidence that reports prices sticky on average for around six months to one year.

To reconcile the estimation results for the Phillips curve at the macro level with the empirical facts observed at the micro level, some authors have suggested to introduce additional real rigidities in the models of the New Neo-Classical Synthesis so that they can produce a persistent inflation with a lower nominal price rigidity. The present research contributes to this effort by focusing on the frictions implied when assuming that the production factors, capital and/or labour, are not mobile between firms. From the moment one of the production factors is assumed to be firm-specific, the marginal cost becomes also firm-specific. Firm-specific marginal cost implies that the marginal cost increases with the production of the firm, while the latter is negatively related to the relative price via the substitution elasticity. As a consequence, in this more realistic setting, firms will prefer smaller and more frequent relative price adjustments.

In order to obtain firm-specific variables in a macroeconomic model, fixed duration contracts are considered both for prices and wages. As a first step, a model based on the traditional assumption of perfect mobility of the production factors is build and estimated. The nominal rigidity obtained is very high in line with the above mentioned problem of the standard New Keynesian Phillips curve. Next, variants of the model with firm-specific capital and/or firm-specific labour are estimated, allowing to analyse the impact of these assumptions on the empirical performance of the model and on the estimated contract length for price setting in the goods market. The main findings are twofold. First, in line with the previous literature on the topic, the introduction of firm-specific capital does lead to a fall in the estimated contract length in the goods market to a more reasonable length of four quarters. In order to obtain this result, the model needs very large real rigidities either in the form of a huge (constant) elasticity of substitution between goods or in the form of an elasticity of substitution that is endogenous and very sensitive to the relative price. Second, concerning the effect of introducing firm-specific labour markets, the results are less promising in terms of empirical performance. The reason is that, for a given degree of nominal price stickiness, firm-specific labour markets only dampen the price impact of a change in demand if the firm-specific labour markets are flexible and the firm-specific wage is responding strongly to changes in the demand for labour. Such a wage flexibility is, however, incompatible with the empirical properties of aggregate wage behaviour.

Finally, this research concludes that neither the model with flat marginal costs nor the one with firm-specific marginal costs can satisfy simultaneously the empirical fact that price changes are at the same time large and frequent. The model with mobile production factors and flat marginal costs does lead to large price changes, but requires a high degree of nominal stickiness to reproduce inflation persistence. The introduction of firm-specific marginal costs does lead to less nominal stickiness, but implies small relative price variations across firms.

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