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Firms' price and wage adjustment in Europe: Survey evidence on nominal stickiness[☆,☆☆]

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ABSTRACT

This paper presents new evidence on the patterns of price and wage adjustment in European firms and on the extent of nominal rigidities. It uses a unique dataset collected through a firm-level survey conducted in 17 European countries and covering various sectors. Several conclusions are drawn from this evidence. Firms adjust wages less frequently than prices, on average every 15 and 10 months, respectively. Price and, especially, wage adjustment exhibit a substantial degree of time-dependence. In particular, wage changes tend to cluster at a specific time of the year, mostly January in the majority of countries. The results of a multivariate analysis indicate that prices are more flexible when competitive pressures in product markets are strong and when labor costs account for a lower fraction of firms' total costs, whereas wages are more flexible when bargaining is decentralized and when the coverage of collective bargaining and the stringency of employment protection legislation are low. Price rigidities are higher in firms with a larger share of high-skilled/white-collar workers.

1. Introduction

A recurrent theme in macroeconomics is whether the adjustment of prices and wages is sufficiently rapid to allow an efficient allocation of resources. In recent decades, a substantial amount of theoretical research devoted to improving the microeconomic foundations of macroeconomic behavior has shown that nominal rigidities are key in determining the effects of different shocks on the economy.

This paper focuses on the nature, extent and sources of nominal rigidities in Europe. Based on new firm-level survey data, it addresses the following issues. How often are prices and wages adjusted in European countries? Is the adjustment staggered or synchronized and does it tend to cluster in specific periods? Are there significant differences across firms, sectors and countries in the frequency and timing of wage and price changes? If such differences are indeed present, how do they relate to structural features of product markets, to the institutional setting that governs wage formation and to firm-specific characteristics?

In answering these questions, this paper provides evidence that enriches the toolbox for the design and calibration of micro-founded New Keynesian DSGE models with nominal rigidities, which have become very popular for policy analysis (see, among others, Woodford, 2003; Gali et al., 2003; Smets and Wouters, 2003 and its various extensions). In these models, the sluggish response of prices and wages to shocks depends on several factors. One of them is the adjustment mechanism generating nominal rigidity, i.e. the type of contract adopted to set prices and wages: in the Calvo (1983) framework price (or wage) setters face a constant probability of adjustment, while in the Taylor (1980)

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model the duration of contracts is non-stochastic and fixed (time-dependent adjustment). The response of prices and wages to a monetary policy shock is larger under Taylor contracts (De Walque et al., 2010), whereas inflation and nominal wages respond more persistently in the Calvo random duration set-up (Knell, 2010). Another crucial element is the length of the contracts, i.e. the parameter chosen to calibrate the duration of both prices and wages, which in principle depends on the characteristics of the economy the model refers to. The response of the economy to shocks depends also on the degree of clustering of price and wage changes and the specific time of the year in which these changes occur. Olivei and Tenreyro (2007) show for the US that the reaction of inflation is faster and larger if an interest rate change takes place in the quarter when most workers actually renegotiate their wages. Finally, in DSGE models real wage rigidity stemming from the interaction of nominal wage and price stickiness generates a higher persistence of inflation and enhances the monetary policy trade-off between output and inflation stabilization. This is particularly so if real rigidity is mechanically induced by wage indexation to past inflation.

Despite the relevant role of the type and duration of contracts, the degree of staggering and the extent of real wage rigidity in shaping the reaction of the economy to shocks in DSGE models, there is no unambiguous evidence in the literature on the specific values duration or indexation parameters should take nor on which adjustment rule better reproduces firms' actual behavior. Moreover, these ingredients are typically taken as exogenous in the design and calibration of such models. Against this background, the contribution of this paper is twofold. It offers empirical ground for a realistic calibration of duration and indexation parameters in Europe and of the relative incidence of staggered versus clustered nominal adjustment. In addition, it provides evidence on the heterogeneity in price and wage rigidity along several dimensions, such as product market structure, labor market institutional setup and firms' characteristics, which empirically validates the theoretical predictions of pricing and labor market models concerning the behavior of prices and wages and its determinants.

The analysis is based on a cross-country dataset – unprecedented by international standards in terms of both geographical and sectoral coverage – collected through an ad-hoc survey on wage and pricing policies at the firm level. The survey was developed within the Wage Dynamics Network (WDN), a research project of the European System of Central Banks. It was carried out, on the basis of a harmonized questionnaire, by 17 national central banks just before the financial crisis started to produce effects in the European economies. Overall, more than 17,000 firms were interviewed, belonging to different size classes and operating in various sectors of the economy. For details on the survey questionnaire, characteristics of the survey as well as on the sampling design, see the online appendix to this volume.

Our paper exploits the information collected in this survey to study the frequency, nature and timing of price and wage changes in European firms. Companion papers that also make use of the WDN survey obtain complementary results on other aspects of price and wage behavior. Bertola et al. (2012) concentrate on firms' adjustment strategies to cost-push shocks, disentangling cost-cutting strategies, pass-through to prices and adjustment of margins. Compared to their work, our analysis adopts a broader perspective, dealing with several features that characterize price and wage setting independently of the occurrence of shocks. Babecký et al. (2012) focus on nominal and real downward wage rigidity and on non-wage labor cost flexibility. Galuscak et al. (2012) deal with the features of wage setting for newly hired workers as compared to that of incumbents.

The structure of this paper is the following. Section 2 describes the cross-country data used in the analysis. Section 3 provides descriptive evidence on the frequency, nature and timing of firms' price and wage adjustment across countries and sectors. Section 4 investigates, within a multivariate econometric analysis, the factors associated with price and wage stickiness. Section 5 concludes.

2. Cross-country survey data and wage-setting institutions

The use of surveys to investigate firms' pricing and in particular price flexibility was pioneered by the seminal work of Blinder (1991) and Blinder et al. (1998) for the US, which was followed by similar studies for other countries.[1] Concerning wages, most analyses based on survey data focus on the extent and reasons of downward wage rigidity (prominent examples are Blinder and Choi, 1990 and Campbell and Kamlani, 1997 for the US; Agell and Lundborg, 2003 for Sweden).

Building on this line of research, the WDN survey on firms' price and wage setting strategies explores several dimensions of price and wage behavior. Within a unified framework, it analyzes the way firms adjust prices and wages and the extent to which firm-specific, sectoral and institutional aspects contribute to the degree of nominal rigidity in the economy. It was launched between the end of 2007 and the first half of 2008 by the European national central banks participating in the project.[2] In this paper, we use a subset of the pooled dataset of the survey results. Our sample covers fifteen countries for which fully harmonized data are available, ten belonging to the euro area (Austria, Belgium, France, Greece, Ireland, Italy, the Netherlands, Portugal, Slovenia and Spain) and five to Central and Eastern Europe (Czech Republic, Estonia, Hungary, Lithuania and Poland).[3] The sample includes firms with more than 5 employees, operating in manufacturing, construction and services (trade, market services and financial services).

Tables 1 and 2 present the composition by country, sector and firm size of the dataset used in this paper, as well as its distribution in terms of the number of employees it represents. Overall, the firms in the sample are just below 15,000, representing almost 48 million employees. By design, the sample is relatively balanced across firm size categories, and its sectoral distribution closely follows that of employment.

The information collected by the WDN survey goes beyond price and wage policies, as it includes also firm-specific features (such as sector of activity, size, composition of the labor force, cost structure), market-specific aspects (such as the intensity of competitive pressures) and factors related to the institutional setup for wage bargaining. The wide country coverage allows, among other, to explore the interplay between labor market institutions and price and wage setting practices.

In this respect, companies were asked about a number of institutional features that govern wage determination, such as the extent of collective wage bargaining, the level at which it takes place, its coverage in terms of employees, and the firm-level adjustment of wages to inflation. This sort of data, mainly of a qualitative nature, is rarely available in administrative and other micro datasets[4]; together with macro-level information on institutional wage-setting mechanisms provided by national experts within the WDN project (see Du Caju

[1] In the euro area, this analysis was carried out by the Eurosystem Inflation Persistence Network (see Altissimo et al., 2006; Fabiani et al., 2007).

[2] The effects of the financial crisis on economic activity and labor markets in Europe had not yet materialized by that time and the general perception of the economic outlook was still one of relative stability. According to the ECB, "Economic activity expanded above the level of potential growth in both 2006 and 2007 and, despite moderating somewhat last year, has proved resilient in early 2008. While uncertainty remains high, the baseline scenario is one of ongoing growth, albeit with lower rates in 2008 than in 2007. According to Eurostat's first estimate, euro area real GDP expanded by 0.8% in the first quarter of 2008 (revised upwards by 0.1 percentage point compared with the flash estimate), after expanding by 0.3% in the previous quarter" (ECB Monthly Bulletin, June, 2008, p. 65). At the same time, the OECD consistently pointed out that "The euro area has been relatively resilient" and "Labour markets remain tight" (OECD Economic Outlook, 2008, pp. 15–16).

[3] Germany participated in the survey, but as the information collected is not fully comparable to that of other countries, we did not include it in our analysis. Estonia joined the euro area in 2011, after the finalization of the survey.

[4] At the same time, like in most ad hoc surveys, the data suffer from shortcomings such as low rates of response, potential misunderstanding in interpreting the questions, the purely cross-sectional nature which does not allow time-series analysis.