Firms' price and wage adjustment in Europe: Survey evidence on nominal stickiness

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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)
model the duration of contracts is non-stochastic and fixed (time-
dependent adjustment). The response of prices and wages to a mone-
tary 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 cali-
brate 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 un-
ambiguous 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 two-
fold. It offers empirical ground for a realistic calibration of duration and
indexation parameters in Europe and of the relative incidence of stag-
gered versus clustered nominal adjustment. In addition, it provides ev-
idence on the heterogeneity in price and wage rigidity along several
dimensions, such as product market structure, labor market institution-
al setup and firms’ characteristics, which empirically validates the the-
etorical 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 cov-
erage – 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,
between 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 operat-
ing in various sectors of the economy. For details on the survey ques-
tionnaire, 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-
ian firms. Companion papers that also make use of the WDN survey ob-
tain complementary results on other aspects of price and wage
behavior. Bertola et al. (2012) concentrate on firms’ adjustment strate-
gies 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 occur-
rence of shocks. Babeky et al. (2012) focus on nominal and real down-
ward wage rigidity and non-wage labor cost flexibility. Galusca 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, with-
in 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 (prom-
inent examples are Blinder and Choi, 1990 and Campbell and Kamlani,

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 partici-
paring 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 sam-
ple includes firms with more than 5 employees, operating in manufactur-
ing, 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 pres-
sures) and factors related to the institutional setup for wage bargain-
ing. The wide country coverage allows, among other, to explore the
interplay between labor market institutions and price and wage set-
ing practices.

In this respect, companies were asked about a number of institu-
tional features that govern wage determination, such as the extent
of collective wage bargaining, the level at which it takes place, its cov-
erage 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 Persis-
tence 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 out-
look was still one of relative stability. According to the ECB, “Economic activity expand-
ed 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.
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 Month-
ly Bulletin, June, 2008, p. 65). At the same time, the OECD consistently pointed out that
“The euro area has been relatively resilient” and “labor 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 ques-
tions, the purely cross-sectional nature which does not allow time-series analysis.
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