

# Wage cost and price joint dynamics at the firm level: an empirical analysis\*

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## Abstract

We estimate a multivariate model to explain the occurrence and magnitude of changes in wages and prices at the firm level. We explicitly allow for interaction between these two variables as well as for correlation through unobservables. The data we use is a panel comprising around 2000 firms from the French manufacturing industry, observed over the years 1998 to 2005. We find the occurrence of wage changes to be time dependent, while their magnitude depend essentially on macroeconomic variables, namely inflation and unemployment. Price changes are driven by the evolution of the firm costs (intermediate input costs and wages), of its production level as well as by the industry level inflation. These differences may be part of the explanation of the rather weak dependence of price changes on wage variations at the firm level.

**Keywords:** price stickiness, wages, factor loadings

**JEL Classification** E31, C23, C25

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\*This research was conducted in the context of the Eurosystem Wage Dynamic Network. The views expressed here are those of the authors and do not necessarily reflect the views of the Banque de France.

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# 1 Introduction

Myriads of papers have shown that, at the macroeconomic level, wages and prices strongly depend on each other. Wage variations depend on both expected and past inflation, and wages or more generally labor costs variations appear to be a major driver of price inflation. However, the (growing but still limited) evidence about the links between wages and prices at the microeconomic level tends to show that these links are much weaker at this level than at the macro level. According to a bunch of surveys recently conducted in the Euro area, about 60% of firms declare that there is no link between their decision to change prices and those of changing wages and prices and only 15% of firms declare there is a strong link between these changes (see Duquant et al., 2008). Loupias and Sevestre (2008) as well as Harris and Sevestre (2009) also provide simple statistics as well as econometric evidence on the low impact of wage variations on producer price changes at the firm level (see also Gaiotti, 2008).

Several explanations of this discrepancy between the micro and the macro evidence can be provided. First, the share of labor costs in total production cost at the firm level is much lower than its share in the value-added at the macro level. While wages represent about 60% of the GDP in France, the share of labor costs in French manufacturing firms was about 20% in the first half of the years 2000', (SESSI, 2008). Moreover, the magnitude of wage changes is not very large. A large fraction of wage variations in our sample are below 2% and, according to Heckel *et al.* (2008), the average wage change in the French manufacturing industry was slightly above 2.2% over the same period). Overall, the typical impact of wage increases on firms production cost appears to be of a limited magnitude. Indeed, after a (relatively small) wage change, the firm can decide to wait for making the necessary adjustment (See Konieczny and Rumler, 2006, for a theoretical model exploiting this argument). Still another possible explanation of this rather low impact of wage variations on prices may be found in the evolution of labor productivity, stemming from the technological change and/or from possible quantity adjustments in the labor force. An increase in labor productivity clearly lowers the need for firms to incorporate wage increases in prices, at least when this increase is not fully transmitted to wages (e.g. see Fuss, 2008). Indeed, several studies have pointed to a limited sensibility of wages to productivity changes (e.g. see Biscourp *et al.*, 2005, Cardoso and Portela, 2005, Guiso *et al.*, 2005, and, more recently, Katay, 2007, and Fuss and Wint, 2008). In other words, it could be that firms partially offset the consequences of wage increases through the "capture" of a fraction of productivity gains they may experience.

In this paper, we add to this literature in two ways. First, we explore the behavior of wages at the firm level and whether it may explain this

weak dependence of price changes on wage variations. Second, we go a bit further in terms of econometric methodology in that we explicitly model the interdependence between wages and prices through unobserved factors. The data we use is a firm panel built from the Banque de France Monthly Business surveys over the years 1997-2005, merged with the ACEMO survey which provides information about wages and employment at the firm level. The remainder of the paper is organized as follows. Section 2 describes the data. The model is described in Section 3 and results are presented and discussed in Section 4.

**NB We do apologize that, due to a technical problem, the full article will be sent tomorrow or tuesday at the latest. Thanks for your understanding.**

**Best regards,  
P. Sevestre**