How strong is the macroeconomic case for downward real wage rigidity?

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ABSTRACT

We explore the existence of downward real wage rigidity (DRWR) at the industry level, based on data from 19 OECD countries for the period 1973–1999. The results show that DRWR compresses the distributions of industry wage changes overall, as well as for specific geographical regions and time periods, but there are not many real wage cuts that are prevented. More important, however, DRWR attenuates larger real wage cuts, thus leading to higher real wages. There is stronger evidence for downward nominal wage rigidity than for DRWR. Real wage cuts are less prevalent in countries with strict employment protection legislation and high union density.

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1. Introduction

In recent years, real wage rigidity has become a key component of several contributions to the business cycle and monetary policy literature, see e.g. Blanchard and Gali (2007), Hall (2005), Krause and Lubik (2006), and Shimer (2005). However, there is considerable controversy about whether real wages really are rigid. The paper focuses on one specific aspect of sluggish wages, namely to what extent real wages are rigid downwards. If present, downward real wage rigidity (DRWR) is particularly relevant for how the economy functions in a downturn, as DRWR affects how adverse shocks may lead to higher unemployment rather than lower wages.

Several recent studies have found evidence for considerable DRWR for job stayers in a number of OECD countries (see Barwell and Schweitzer, 2004; Bauer et al., 2007; Christofides and Li, 2005; Dickens et al., 2005), as well as in experimental work (Falk and Fehr, 1999) and in surveys of managers and firm owners (Bewley, 1999; Agell and Lundborg, 2003). While these findings are useful for our understanding of individual wage setting, the effects on aggregate variables remain open. Even if individual wages are rigid in real terms, firms may respond by other means, like changing the composition of the work force.

And even if wage rigidity binds in some firms, jobs may be shifted over to other firms with lower or more flexible wages. With annual job turnover rates above 20 percent, as is the case in many OECD countries (see Haltiwanger et al., 2008), and generally higher worker turnover rates, rigid wages for many individual job stayers need not imply the same rigidity of average wages. Consistent with this hypothesis, Farès and Lemieux (2001) find that in Canada most of the real wage adjustments over the business cycle are experienced by new entrants.

In contrast to the previous literature, we explore the existence of DRWR at the industry level, based on data from 19 OECD countries for the period 1973–1999, covering in total 449 country-year samples. The key aim is to explore whether the effects of the wage rigidity found in micro-data are entirely offset by compositional and other changes, or whether there remains an effect of individual downward rigidity on aggregate wage data. In our view it is important to distinguish between these two alternatives. If there is no sign of DRWR in industry-level wage data, it seems hard to believe that the individual rigidity has a non-negligible effect on industry output or employment. On the other hand, if there is DRWR in industry-level wage data, rigidity prevails in spite of varying compositional effects. In this case effects on industry output and employment also seem more likely.

We outline a simple theoretical model of DRWR, which serves as a framework for organizing the data and to interpret the empirical findings. The empirical analysis is a variant of the wage-change approach initiated by McLaughlin (1994), drawing upon our previous work on downward nominal wage rigidity (Holden and Wulfsberg, 2008). The key idea is to detect possible DRWR by comparing the empirical real wage-change distribution with a constructed counterfactual or notional (as if no rigidity exists) wage-change distribution. The shape of the notional wage-change distribution is constructed on the basis of country-year samples with high real and nominal wage growth, where downward rigidities are less likely to bind. If the empirical number of real wage cuts is significantly smaller than expected from the notional distributions, we conclude that wages are rigid downwards. Robustness checks in Holden and Wulfsberg (2008) indicate that this method has very good properties for detecting the downward wage rigidity that exists in the data.

The paper is organized as follows. Section 2 presents the theoretical model, while Section 3 describes data and the empirical approach. Section 4 presents the main results. DRWR is fairly small but statistically significant for the OECD countries, and in particular the extent of large real wage cuts is reduced. In Section 5 we make use of the broad scope of our data across countries and time, and explore whether the variation in DRWR can be explained by economic and institutional variables. The analysis shows that real wage cuts are less prevalent in countries with strict employment protection legislation and high union density. Section 6 concludes and discusses the relevance of our results for modeling wage rigidity in the context of business cycle analysis.

2. DRWR and the distribution of wage changes

Recent studies have put forward two main explanations for DRWR. First, within a rational behavior framework, Ellingsen and Holden (1998) and Postlewaite et al. (2004) show that real wage resistance may follow if consumption patterns are costly to change. Second, a behavioral justification can be made from the existence of loss aversion, meaning that people are more averse to losses relative to their reference level than they are attracted to the same-sized gains (Kahneman and Tversky, 1979).

We use a simple model of DRWR under firm-level wage bargaining, drawing upon Bhaskar (1990), Driscoll and Holden (2004), and McDonald and Sibly (2005). One motivation for the model is to make clear which empirical features to look for in an investigation of DRWR. Furthermore, the model provides a framework for distinguishing between different types of real wage rigidity. Let the profits of the firm be a decreasing function of the real wage w,

$$\pi = w^{1-\eta} \quad \text{where } \eta > 2, \tag{1}$$

and η is the elasticity of product demand.[1] A worker is assumed to have an indirect utility function which depends on the current and past real wages, w and w_{-1},

$$V = w^{1+D\mu} w_{-1}^{-D\mu}, \quad \text{where } \mu \geqslant 0, \tag{2}$$

and D is a dummy variable which is equal to unity if real wages fall, and is zero otherwise. As long as real wages do not fall, utility is simply linear in current real wages. However, the model allows for the possibility that workers have loss aversion, in the sense that they compare their current wage with their past wage (if $\mu > 0$), incurring an additional utility loss if the real wage falls. In this case, utility is still continuous in current and past real wages, and strictly increasing in current real wages. Yet there is a kink in the utility function at the point where the wage is equal to its past value, implying that utility is non-differentiable from the left (when $w < w_{-1}$) at the point $w = w_{-1}$. In the limiting point when $\mu = 0$ there is no DRWR.

The wage setting is modeled by use of the (symmetric) Nash bargaining solution, where the bargaining outcome is the wage that maximizes the product of the firm's and the worker's gain from reaching an agreement, that is the payoffs as compared to the disagreement points, π_0 for the firm (for simplicity set to zero), and V_0 for the worker[2]:

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[1] This profit function follows from a model of monopolistic competition, in which firms set the output price facing a downward sloping demand curve, η is the elasticity of demand, labor is the only production factor, and there are constant returns to scale. Irrelevant constants are omitted.

[2] One interpretation of this formulation is a union-firm setup, where the union represents the interests of the median worker who by seniority rules is sheltered from redundancies. In most OECD countries, the majority of the workforce is covered by collective bargaining agreements. However, the key features could also be derived in an efficiency wage framework, as long as the crucial assumption that workers experience a utility loss if their wages fall