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Does downward nominal wage rigidity dampen wage increases?

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ABSTRACT

Focusing on the compression of wage cuts, many empirical studies find a high degree of downward nominal wage rigidity (DNWR). However, the resulting macroeconomic effects seem to be surprisingly weak. This contradiction can be explained within an intertemporal framework in which DNWR not only prevents nominal wage cuts but also induces firms to compress wage increases. We analyze whether a compression of wage increases occurs when DNWR is binding by applying *Unconditional Quantile Regression* and *Seemingly Unrelated Regression* to a dataset comprising more than 169 million wage changes. We find evidence of a compression of wage increases and only very small effects of DNWR on average real wage growth. The results indicate that DNWR does not provide a strong argument against low inflation targets.

1. Introduction

Concerns about potentially adverse employment effects of low inflation have given rise to a plethora of studies on the extent of downward nominal wage rigidity (DNWR), such as the microeconometric multicountry studies of Behr and Pötter (2010), Knoppik and Beissinger (2009) and Dickens et al. (2007) or the survey evidence provided by Bewley (1999).[3] These concerns are based on Tobin's (1972) hypothesis that if nominal wages are downwardly rigid, a certain amount of positive inflation may be necessary to ease firms' real wage adjustments in response to idiosyncratic shocks ("inflation may grease the wheels of the labor market"). Focusing on the compression of wage cuts, microeconometric studies usually find a high degree of DNWR. However, the resulting macroeconomic effects on aggregate real wages and employment seem to be surprisingly weak, leading Lebow et al. (1999) to speak of a "micro–macro puzzle".

A possible solution to that puzzle has been offered by Elsby (2009), who develops an intertemporal model in which downward wage rigidity arises because nominal wage cuts are followed by sharp decreases in productivity. Wage increases therefore become irreversible to some degree. Firms that increase wages during upswings may find it difficult to reverse their decisions later when the economic environment will possibly deteriorate. Forward-looking firms take the path dependence of wage changes into account when determining the optimal wage policy; they refrain from large wage

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[3] Dickens et al. (2007) also deal with the extent of real wage rigidities. Holden and Wulfsberg (2008) have carried out a multi-country study on DNWR using industry data.

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increases to reduce the probability of costly future nominal wage cuts. Moreover, because DNWR raises the wage level inherited from the past, firms do not have to raise wages as much or as often as in a situation without wage rigidity to obtain the profit-maximizing wage level. As a consequence, firms will compress wage increases as well as wage cuts in the presence of DNWR. This leads to the surprising prediction that average real wage growth, and hence aggregate real wages, should not be affected by DNWR and that the aggregate employment effects should be weak or nonexistent.

The contribution of this paper to the literature is twofold. First, we extend the empirical approach of Elsby (2009) by applying Unconditional Quantile Regressions (UQR) to the data in addition to variants of Elsby's OLS model specification. The application of UQR enables us to take into account the variance and the cross variable covariance in the microdata. Second, we provide an empirical analysis of the effects of inflation on the shape of the real wage change distribution for Germany, a country with stronger labor unions and a higher labor union density than in the United States and the United Kingdom—for which Elsby provides empirical evidence. Our analysis provides some insights into whether Elsby's predictions can be observed in a country that may already be affected by wage compression due to its labor market institutions.

In line with the empirical literature on DNWR, the analysis focuses on the wage change distribution of "job stayers", i.e., employees who have a "stable employment relationship" with an employer, whereas Elsby's (2009) analysis also includes "job movers". This inclusion may lead to a systematic relationship between inflation and the compression of the real wage change distribution that has nothing to do with DNWR. The reason is that during economic upswings, inflation often rises, and at the same time, more voluntary job changes occur that go hand in hand with real wage increases (see, e.g., Cornelißen et al., 2007). As a robustness check and a further innovation relative to Elsby's analysis we also analyze whether the results are changed if inflation forecasts are used instead of actual inflation, because for the distribution of wage changes expected future inflation could be more relevant.

The empirical analysis is undertaken for West Germany for the 1975–2007 period using the IAB Beschäftigten–Historik, the Employee History File of the Institute for Employment Research of the German Federal Employment Agency. The dataset comprises the total population gainfully employed and covered by the social security system. After our data selection, the remaining employment spells enable us to analyze over 169 million earnings changes, amounting to more than 5.2 million earnings changes per year on average. Among the main advantages of this dataset are the sheer wealth of information and the high reliability of the earnings data.

The remainder of the paper is structured as follows. The next section summarizes the key findings of Elsby's (2009) model. Section 3 contains the data description. Section 4 presents our empirical implementation and results as well as a comparison with Elsby's results. Section 5 deals with the macroeconomic implications, and Section 6 concludes.

2. The model

In this section, we explain the main idea of the underlying model and present the key findings needed for the empirical testing.

The main feature of Elsby's (2009) intertemporal model of worker resistance to wage cuts is that wage increases become irreversible to some degree because nominal wage cuts lead to a sharp decrease in work effort. This assumption is based on Bewley's (1999) findings that a key reason for the reluctance to cut nominal wages is the belief that nominal wage reductions can damage worker morale and that morale is a key determinant of worker productivity. A wage increase will raise work effort. However, a wage cut of the same amount will reduce effort by a greater amount. This implies that wage increases can be reversed in the future only at an extra cost. As a consequence, forward-looking firms will not only reduce the incidence of wage cuts, but will also moderate wage increases.[4]

In Elsby's (2009) discrete-time, infinite-horizon model worker–firm pairs are hit by idiosyncratic nominal productivity shocks. In the frictionless case, nominal wage changes would be equal to changes in nominal productivity. DNWR changes the shape of the frictionless wage change distribution in two characteristic ways. First, there is a range of values for the nominal productivity shock, for which the firm finds it optimal not to change the nominal wage. This leads to a spike at zero in the nominal wage change distribution and accordingly to a spike at minus the inflation rate in the real wage change distribution. Second, if the change in nominal productivity is strong enough and the firm decides to change the nominal wage, the wage change will be compressed relative to the frictionless case.

Fig. 1 presents simulated real wage change distributions for high and low inflation based on the predictions of Elsby's (2009) theoretical model. One can see that real wage increases are compressed in the case of low inflation.[5]

Notice that in the absence of DNWR, a change in the productivity growth rate should lead to a one-to-one shift of the real wage change distribution, whereas a change in the inflation rate should leave the distribution unaltered. In contrast, if DNWR exists, one should observe a systematic relationship between changes in the inflation rate and/or productivity growth rate, on the one hand, and changes in the shape of the real wage change distribution, on the other hand. In the

[4] It must be stressed that the argument that DNWR leads to a compression of wage increases does not depend on this specific justification for DNWR. It would also apply under other reasons for DNWR, e.g., if it is caused by the fact that the wage of the old wage contract still determines pay while the bargaining parties bargain over a new contract (so-called holdout). For a detailed theoretical discussion see MacLeod and Malcomson (1993) and Holden (1994).

[5] In the simulation, the rate of productivity growth has been kept constant. Similar effects on the real wage change distribution are obtained if the (average) rate of productivity growth is changed instead of a change in the inflation rate.