



Evaluating the economic significance of downward nominal wage rigidity[☆]

Michael W.L. Elsby^{a,b}

^a Department of Economics, University of Michigan, Ann Arbor, MI 48109-1220, USA

^b NBER, USA

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ABSTRACT

The existence of downward nominal wage rigidity has been abundantly documented, but what are its economic implications? This paper demonstrates that, even when wages are allocative, downward wage rigidity can be consistent with weak macroeconomic effects. Firms have an incentive to compress wage increases as well as wage cuts when downward wage rigidity binds. By neglecting compression of wage increases, previous literature may have overstated the costs of downward wage rigidity to firms. Using micro-data from the US and Great Britain, I find that the evidence for the compression of wage increases when downward wage rigidity binds. Accounting for this reduces the estimated increase in aggregate wage growth due to wage rigidity to be much closer to zero. These results suggest that downward wage rigidity may not provide a strong argument against the targeting of low inflation rates.

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A longstanding issue in macroeconomics has been the possible long run disemployment effects of low inflation. The argument can be traced back to Tobin (1972): if workers are reluctant to accept reductions in their nominal wages, a certain amount of inflation may “grease the wheels” of the labor market by easing reductions in real labor costs that would otherwise be prevented. This concern has resurfaced with renewed vigor among economists and policymakers in recent years as inflation has declined and evidence for downward rigidity in nominal wages has accumulated. A stylized fact of recent micro-data on wages is the scarcity of nominal wage cuts relative to nominal wage increases (Lebow et al., 1995; Kahn, 1997; Card and Hyslop, 1997). This evidence dovetails with surveys of wage-setters and negotiators who report that they are reluctant to cut workers’ wages (see Howitt, 2002, for a survey). In an influential study, Bewley (1999) finds that a key reason for this reluctance is the belief that nominal wage cuts damage worker morale, and that morale is a key determinant of worker productivity.¹

Exploring the macroeconomic implications of downward nominal wage rigidity from both a theoretical and an empirical perspective, I find that these effects are likely to be small. Section 1 begins by formulating an explicit model of

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E-mail address: elsby@umich.edu

¹ While Bewley’s explanation has been influential, it is not the only possible explanation. Other studies have suggested that the tendency for past nominal wages to act as the default outcome in wage negotiations can lead to downward wage rigidity (MacLeod and Malcomson, 1993; Holden, 1994).

worker resistance to nominal wage cuts.²Based on Bewley's results, the model makes the simple assumption that wage rigidity arises because the productivity of workers declines sharply following nominal wage cuts.³Wage rigidity, according to Bewley's evidence, is therefore allocative in the sense of Barro (1977), because it affects the productivity of workers. This simple assumption implies a key insight that has not been recognized in the literature—that nominal wage increases in this environment become irreversible to some degree. A firm that raises the wage today, but reverses its decision by cutting the wage by an equal amount tomorrow will experience a reduction in productivity: today's wage increase will raise productivity, but tomorrow's wage cut will reduce productivity by a greater amount.⁴

Section 2 shows that this simple insight equips us with a fundamental prediction: firms will compress wage increases as well as wage cuts in the presence of downward wage rigidity. This occurs through two channels. First, forward-looking firms temper wage increases as a precaution against future costly wage cuts. Raising the wage today increases the likelihood of having to cut the wage, at a cost, in the future. Second, even in the absence of forward-looking behavior, downward wage rigidity raises the level of wages that firms inherit from the past. As a result, firms do not have to raise wages as often or as much to obtain their desired wage level.

These two forms of compression of wage increases culminate in the perhaps surprising prediction that worker resistance to wage cuts has no effect on aggregate wage growth in the model. This result challenges a common intuition in the previous empirical literature on downward wage rigidity. This literature has assumed (implicitly or otherwise) that the existence of downward wage rigidity has no effect on wage increases.⁵In addition, many studies go on to report positive estimates of the effect of downward wage rigidity on aggregate wage growth, seemingly in contradiction to the predictions of the model. The model suggests an explanation for this result: neglecting the compression of wage increases leads a researcher to ignore a source of wage growth moderation, and thereby overstate the increase in aggregate wage growth due to downward wage rigidity.

To assess the empirical relevance of firms' compression of wage increases as a response to downward wage rigidity testable implications of the model are derived to take to the data. The implied percentiles of the distribution of wage growth across workers can be characterized using the model. This reveals that the effects of downward wage rigidity on the compression of wage increases can be determined by observing the effects of the rates of inflation and productivity growth on these percentiles. Higher inflation eases the constraint of downward nominal wage rigidity which in turn reduces the compression of wage increases, raising the upper percentiles of wage growth. A symmetric logic holds for the effects of productivity growth.

Evidence on these predictions is presented in Section 3 using a broad range of micro-data for the US and Great Britain. I find significant evidence for the compression of wage increases related to downward wage rigidity, consistent with the implications of the model. Moreover, accounting for this limits the estimated increase in aggregate real wage growth due to downward wage rigidity from up to 1.5 percentage points to no more than 0.15 of a percentage point, an order of magnitude smaller.

Section 4 then considers the implications of these results for the true implied costs of downward wage rigidity to firms. A simple approximation method allows these costs to be quantified using moments of the available micro-data on wages. This approximation reveals that the model implies that the costs of wage rigidity are driven by reductions in workers' effort that firms must accept when they reduce wages, contrary to the common intuition that downward wage rigidity increases the cost of labor. In addition, erroneously concluding that downward wage rigidity raises the rate of aggregate wage growth, as previous literature has done, leads to a substantial (more than twofold) overstatement of the costs of downward wage rigidity on firms. Finally, a sense of the magnitude of the implied long run disemployment effects of wage rigidity can be gleaned from the model. For the rates of inflation and productivity growth observed in the data, the effects of downward nominal wage rigidity under zero inflation are unlikely to reduce employment by more than 0.25 of a percentage point.^{6,7}

² Given the empirical evidence for worker resistance to wage cuts, it is surprising that there has not yet been an explicit model of such wage rigidity in the literature. The need for such a model has been noted by Shafir et al. (1997, p. 371): "Plausibly, the relationship [between wages and effort] is not continuous: there is a discontinuity coming from nominal wage cuts.... A central issue is how to model such a discontinuity." This sentiment is echoed more recently by Altonji and Devereux (2000, p. 423, note 7) who wrote: "[I]t is surprising to us that there is no rigorous treatment in the literature of how forward-looking firms should set wages when it is costly to cut nominal wages."

³ Bewley also suggests that wage rigidity is enhanced by firms' inability to discriminate pay across workers within a firm. For simplicity, I abstract from this possibility. For models that incorporate this feature, but abstract from downward nominal wage rigidity, see Thomas (2005) and Snell and Thomas (2007).

⁴ In this sense, the model is formally similar to asymmetric adjustment cost models, such as the investment model of Abel and Eberly (1996) and the labor demand model of Bentolila and Bertola (1990).

⁵ This is a key identifying assumption in Card and Hyslop (1997). However, their analysis is no more subject to this criticism than other previous empirical work on downward wage rigidity: Kahn (1997), Altonji and Devereux (2000), Nickell and Quintini (2003), Fehr and Götte (2005), Dickens et al. (2006), among others, implicitly make the same assumption.

⁶ Despite some common formal elements, the mechanism here is distinct from that emphasized by Caplin and Spulber (1987). They show that the uniformity of the effects of aggregate monetary shocks on individual real prices can yield monetary neutrality in an (s,S) pricing environment. In the current analysis, firms' endogenous wage setting response to idiosyncratic shocks allows them to obviate much of the costs of worker resistance to wage cuts.

⁷ This result may also help to reconcile an apparent puzzle in the literature. In contrast to micro-level evidence, empirical support for the macroeconomic effects of downward wage rigidity has been relatively scant (Card and Hyslop, 1997; Lebow et al., 1999; Nickell and Quintini, 2003; Smith, 2004). The results of this paper suggest a simple explanation: since previous studies have ignored the compression of wage increases, this has led researchers to overstate the increase in aggregate wage growth and thereby the implied costs of downward wage rigidity to firms.

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