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Downward real wage rigidity and equal treatment wage contracts: Theory and evidence ☆

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ABSTRACT

Recent dynamic contracting models of downward real wage rigidity with "equal treatment" — newly hired workers cannot price themselves into jobs by undercutting incumbents — imply that real wages are relatively rigid in "bad" times but upwardly flexible during "good" times. We use an administrative panel dataset to establish that such asymmetries are a feature of West German labor markets. We find that the elasticity of real wages with respect to output is very close to zero in downswings but positive and highly significant in upswings. In a separate analysis we find that after controlling for match fixed effects, the cyclicality of new hire wages is approximately the same as that for incumbent wages, regardless of whether or not they joined the establishment from unemployment. This is supportive of equal treatment. We also show that a four parameter version of the equal treatment contracting model of Snell and Thomas (2010) can replicate reasonably well the salient time series properties and co-properties of real wages, output, and unemployment, in particular the asymmetric response of wages to output that we find in the data.

1. Introduction and overview

There is now a sizeable literature devoted to estimating the cyclicality of real wages using large panel datasets to correct for composition bias (e.g., Solon et al., 1994 for the US, Devereux and Hart, 2006 for the UK, Martins et al., 2012 for Portugal, and Stüber, 2017 for Germany). However, recent models of dynamic wage contracting that exhibit downward real wage rigidity (in particular the models of Menzio and Moen (2010) and Snell and Thomas (2010)) suggest that wages will be asymmetrically cyclical — relatively rigid in "downswings" when productivity and output are falling but upwardly flexible during "upswings" when productivity and output are rising.[1] Such asymmetries are important for unemployment

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[1] The sign correlation of output and productivity growth is close to but not exactly 100% in our theoretical model. There are some rare occasions when productivity suffers a small drop but output rises. In our simulations these events occur less than 2% of the time.

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(and output) dynamics as we will show. They also matter for the *long-run level* of unemployment; Benigno et al. (2015) argue that long-run unemployment rates and the variance of productivity growth are positively associated. They explain this finding by asymmetric wage adjustments to productivity growth of the type we argue for here.[2]

In this paper we use a sample of workers drawn from an administrative German panel dataset for the years 1978–2014 to establish that — defining up- and downswings in terms of positive and negative growth in real GDP per capita — asymmetries as predicted by models of dynamic wage contracting that exhibit downward real wage rigidity seem to be a feature of West German[3] labor markets. The key empirical feature to emerge from our study is that the elasticity of real wages with respect to GDP per capita (henceforth just "elasticity"[4] and henceforth real GDP per capita referred to as just "output" for brevity) is close to zero and insignificant in downswings. However, in upswings the elasticity is positive and statistically significant. In a separate analysis we find that after controlling for match fixed effects the cyclicality of new hire wages is not significantly different from that of incumbents, regardless of which cyclical indicator is used (unemployment or output) and regardless of whether or not the worker was employed immediately before joining the firm. This result is particularly important: if wages are downwardly rigid in downswings then it suggests that the unemployed cannot price themselves into jobs by "undercutting" incumbents and hence labor markets will not clear (see, e.g., Hall, 2005; Gertler and Trigari, 2009; Snell and Thomas, 2010).

In the second part of this paper we show that a simple three or four parameter version of Snell and Thomas's (2010) equal treatment contracting model can generate a strong positive elasticity in upswings and an elasticity close to zero in downswings. In the model, risk neutral firms have an incentive to smooth the wage profiles of risk averse workers by offering a contract that limits the rate at which real wages fall in downswings. The rate of fall is the result of a trade-off for the firm between wanting to avail itself of cheaper new hires on the one hand and not wanting to create too much variability for the incumbents on the other. This results in a maximum rate of wage fall no matter how cheap new hires potentially become. The existence of an equal treatment constraint — new hires must be paid the same as incumbents — implies that the unemployed cannot price themselves into jobs by offering to undercut incumbent wages. As a result, if the economy suffers a negative and persistent productivity shock, downwardly sluggish wages will generate unemployment that will endure until either productivity recovers or until wages have fallen sufficiently far to clear the labor market. In this scenario, real wages will exhibit little covariation with output when productivity is falling. By contrast, wages adjust rapidly (upwards) in good times when productivity is high so that in upswings they will be strongly positively correlated with output. The reason for the asymmetric response is that workers are ex post mobile, so that in good times their outside opportunity has a high value; firms have no option but to raise wages to match this and so wages are upwardly flexible during upswings.

The model requires total factor productivity (TFP) as a sole input. To assess the model's fit to the data we follow the real business cycle (RBC) literature and generate a synthetic TFP series whose growth and first order autocorrelation matches that of German TFP growth. Using this series, the model generates wage and unemployment series that display the same asymmetric response patterns we found in the data. In addition the first order autocorrelation coefficients and variances of the model's simulated real wage growth, unemployment and output growth broadly match their counterparts in the data. As far as we know, this is the first paper not only to look at the empirical downward real rigidity of wages for workers including new hires, but also to simulate a microfounded model that is capable of matching these observed regularities.[5]

The outline of the paper is as follows. In Section 2 we review both the empirical and theoretical literature on downward rigidity. In Section 3 we present an overview of the data. In section 4 we present tests of equal treatment and the evidence for asymmetric wage cyclicality. In section 5 we present two versions of the model and simulate them to see if predictions for output, unemployment and wages match those of the data. In Section 6 we consider robustness checks and other caveats: the main results on asymmetry are robust with respect to dropping the "German reunification years" from the sample and dropping the early years from the sample. The results on equal treatment — that new hires have the same wage cyclicality as incumbents — are robust with respect to increasing the length of time an employee remains a new hire after joining the firm. We also show that the asymmetry result holds when we split the data into six broad industrial sectors providing some reassurance that the asymmetry is a pervasive feature of the West German economy. Section 7 contains concluding comments.

[2] Using an *ad hoc* model of downward rigidity they demonstrate that higher variance of productivity growth translates into higher unemployment as downturns lead to higher unemployment whereas in upturns unemployment is the same as full employment ensues; a similar effect applies if trend productivity growth falls, again leading to higher unemployment.

[3] All of the data in this paper, apart from the total factor productivity (TFP) and the consumer price index (CPI) series, are for West Germany (excluding Berlin) only (the data for TFP and CPI are for West Germany prior to 1991 and the whole of Germany afterwards). Henceforth and unless otherwise stated we refer to West Germany as just "Germany" for brevity.

[4] Use of the term "elasticity" to denote the regression coefficient of wage on output growth is somewhat misleading as our estimate has no clear structural interpretation at this point. We use the term for brevity and for consistency with the cognate empirical literature.

[5] Snell and Thomas (2010) only perform unemployment simulations.