Wage rigidity and job creation

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A R T I C L E   I N F O

A B S T R A C T

Recent research in macroeconomics emphasizes the role of wage rigidity in accounting for the volatility of unemployment fluctuations. We use worker-level data from the CPS to measure the sensitivity of wages of newly hired workers to changes in aggregate labor market conditions. The wage of new hires, unlike the aggregate wage, is volatile and responds almost one-to-one to changes in labor productivity. We conclude that there is little evidence for wage rigidity in the data.

1. Introduction

Recent research in macroeconomics emphasizes the role of wage rigidity in accounting for the volatility of unemployment fluctuations. Shimer (2005) and Costain and Reiter (2008) documented the failure of a search and matching model to match the volatility of job creation and unemployment. Hall (2005) argued that this problem could be fixed with equilibrium wage stickiness instead of period-by-period Nash bargaining over wages. Since then, a large number of studies have appealed to some form of wage stickiness to improve the performance of their model to match the data (Menzio, 2005; Farmer and Hollenhorst, 2006; Moen and Rosen, 2006; Braun, 2006; Blanchard and Galí, 2007; Hall and Milgrom, 2008; Gertler and Trigari, 2009; Kennan, 2010; Shimer, 2010, among others).[1]

Sticky wage setting seems to be supported by the observation that wages are less volatile than most business-cycle models predict. However, the volatility of the aggregate wage is neither a sufficient nor a particularly informative statistic to measure the kind of wage rigidity that is required to amplify unemployment fluctuations. In a frictional labor market, job creation is a forward-looking decision and the amount of jobs that are created depends on the expected net present value of wages over the entire duration of the newly created jobs (Boldrin and Horvath, 1995; Shimer, 2004; Pissarides, 2009; Kudlyak, 2009). Under long-term wage contracting, the cyclical behavior of this present value may be very different from the cyclical behavior of the aggregate wage. This paper explores whether there is any evidence for rigidity in the present value of wages of newly hired workers.

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[1] In our usage the term wage stickiness denotes an explicitly modeled friction that prevents wages from adjusting to the level that would otherwise obtain. Wage rigidity refers to the observed response of wages to changes in productivity in the data being smaller than one. Clearly, wage stickiness implies wage rigidity, but a certain amount of wage rigidity can also be generated in models with flexible wage setting.

Worker-level data from the Current Population Survey (CPS) are used to measure the sensitivity of the wages of newly hired workers to changes in aggregate labor market conditions and to show that the wages of these workers are much more cyclical than the average wage. In our baseline estimates, the elasticity of the wage with respect to productivity is 0.8 for new hires compared to 0.2 for all workers. The difference comes from the fact that the wage of workers in existing employment relationships does not respond much to changes in aggregate conditions. Since there are many more workers in ongoing jobs than new hires, this makes the aggregate wage look rigid.

Wages in ongoing jobs grow largely independently of aggregate productivity while wages at the start of an employment relationship react strongly to changes in aggregate productivity, similar to what Baker et al. (1994) found for a single firm. This finding suggests that wages are set in long-term wage contracts. Compared to the results in Rudanko (2009), the data are consistent with contracts under limited commitment on the part of both worker and firm.[2]

What do our findings imply for the unemployment volatility puzzle? Long-term wage contracts with a very cyclical starting wage generate strong cyclicality in the expected net present value of wages as well. In that sense, there is very little evidence for wage rigidity in the data.

Previous empirical studies of wage rigidity by macroeconomists have been concerned with *aggregate* wages (Dunlop, 1938; Tarshis, 1939; Cooley, 1995). If the importance of wages of new hires has been recognized at all, then a careful empirical study has been considered infeasible because of lack of data.[3] Labor economists who have studied wages at the micro-level have mostly been concerned with wage changes of individual employees (Bils, 1985). Thus, the analysis has naturally been restricted to wages in *ongoing* employment relationships, which have been found to be strongly rigid. Notable exceptions are Devereux and Hart (2006) and Barlevy (2001) who study job changers and find their wages to be much more flexible than wages of workers in ongoing jobs.

The main difference between these studies and ours is that our focus is on newly hired workers, i.e. workers coming from non-employment, which is the relevant wage series for comparison to standard search models, rather than job changers.[4] Since wages of non-employed workers are not observed, a different estimation procedure needs to be applied, which does not require individual-level panel data. This procedure has the additional advantage that the CPS can be used, which yields a much larger number of observations than earlier studies, which use the PSID or NLSY datasets.[5]

Like previous research, the data exhibit strong evidence for cyclical shifts in the composition of employed workers. Solon et al. (1994) show that failing to control for (potentially unobservable) heterogeneity across workers leads to a substantial downward bias in the cyclicality of wages. We document the cyclical patterns in the differences between new hires and the average worker in demographics, experience and particularly in the schooling level that cause this bias. Controlling for fluctuations in the skill level of the workforce is particularly important for the study of newly hired workers where some of the composition bias is likely to be driven by selection in the hiring process. This constitutes a potential weakness of our approach, because individual-specific first differences cannot be taken, and thus it is not possible to control for unobservable components of skill as Solon, Barsky and Parker do. However, an application of our methodology to the PSID indicates that controlling for observable skill is sufficient to control for composition bias. While unobservable components of skill might be important, they seem to be sufficiently strongly correlated with education to be captured by our controls.[6]

The two studies most closely related to ours are Pissarides (2009) and Kudlyak (2009). Both of these papers argue as well that wage stickiness in old matches does not matter for job creation as long as the net present value of wages for newly created matches responds to changes in aggregate conditions. Pissarides (2009) surveys the empirical literature on the cyclicality on wages discussed briefly above and concludes that the evidence is not consistent with explanations for the unemployment volatility puzzle that are based on wage stickiness. Kudlyak (2009), like this paper, aims to provide direct evidence on the cyclicality of the net present value of wages in new matches, which she calls the wage component of the user cost of labor. Kudlyak uses panel data from the NLSY and, as a result, there are methodological differences between her paper and ours, see Section 4 for a discussion. Despite these differences, the estimates in Kudlyak's paper and in ours are similar.

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[2] Apart from long-term contracts, which insure risk-averse workers against fluctuations in their wage, theory suggests several other reasons why wages of workers in ongoing employment relationships vary less with aggregate labor market conditions than wages of new hires: efficiency wages (Yellen, 1984), unions (Oswald, 1985) or motivational concerns (Bewley, 1999).

[3] Hall (2005) writes that he does "not believe that this type of wage movement could be detected in aggregate data" (p. 51). Bewley (1999) claims that "there is little statistical data on the pay of new hires" (p. 150).

[4] Job changers include both workers that experience an unemployment spell and find a new job before the next interview date and workers that move directly from one job to another. Potentially, these are two different groups of workers, although it is shown in Section 3.3 that there is no large difference in the cyclicality of their wages.

[5] More recent literature, inspired in part by this paper, recognizes the importance of wages of new hires and tries to gather more information on how these wages are set. For example, Galuščák et al. (2010) describe a firm-level survey on wage and price-setting procedures in 15 European countries in the context of the ECB's wage dynamics network, which includes specific questions about the determinants of the pay of newly hired workers.

[6] In addition, one may be worried about job heterogeneity. If the average job that is filled in a boom is of higher quality than in a recession, the wage of new hires may look more cyclical than the average wage for an occupation. One could argue, however, that for job creation it is irrelevant whether the wage of new hires is cyclical because the wage for each occupation changes or because there are cyclical shifts in the composition of occupations. To control for job heterogeneity and worker heterogeneity simultaneously, one needs matched employer–employee data. Carneiro et al. (2012) use such data for Portugal 1986–2005 and find that, controlling for composition bias due to both sources, entry wages are much more procyclical than wages in ongoing jobs, consistent with our results.