European Economic Review 68 (2014) 71–92

Contents lists available at ScienceDirect

European Economic Review

journal homepage: www.elsevier.com/locate/eer

The labor wedge as a matching friction

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ARTICLE INFO

Article history:
Received 11 July 2013
Accepted 25 February 2014
Available online 11 March 2014

Keywords:
Labor wedge
Business cycles
Search and matching

ABSTRACT

We use a search and matching model to decompose the labor wedge into three classes of labor market frictions and evaluate their role for the labor wedge and unemployment. We find that there is an asymmetric effect of labor market frictions on the labor wedge and unemployment. While the wedge is to a large extent explained by changes in matching efficiency, unemployment is accounted for by the combination of frictions to matching efficiency, job destruction and bargaining. If search and matching frictions give rise to the labor wedge, then it is relevant for explaining unemployment mainly through changes in matching efficiency.

For the last 25 years, macro and labor economists have pointed to large cyclical variations in the relationship between the marginal rate of substitution (MRS) between leisure and consumption and the marginal product of labor (MPL) as an important feature of business cycles. In their business cycle accounting framework, Chari et al. (2007) (CKM) label this relationship a "labor wedge" and argue that it accounts for 60% of output fluctuations in the U.S.

There are a number of possible explanations for the labor wedge. However, search and matching frics are a natural source because they introduce a bilateral monopoly between workers and firms. These frictions generate monopoly rents and create a gap between the MRS and the MPL that is volatile enough to account for variations in the labor wedge at business cycle frequencies. Alternative sources of the labor wedge, such as consumption and labor taxes, micro heterogeneity, non-competitive features of goods markets, are not as promising because they cannot explain the observed volatility of the labor wedge.[1]

Apart from the fact that the labor wedge accounts for 60% of U.S. output fluctuations, some recent papers (see Shimer, 2009) have pointed out that understanding the labor wedge would give insight into the nature of unemployment. In this paper we ask if labor market frictions that are considered important for explaining unemployment in a search and matching framework are also important for explaining the labor wedge in a general equilibrium model with search and matching frictions.

We consider three labor market frictions which are known to be important in explaining unemployment fluctuations: variations in the job destruction margin as suggested by Mortensen and Pissarides (1994), variations in the bargaining power of workers and firms as in Hall (2005a), and variations in the efficiency of the matching process. Specifically, we look at the labor wedge through the lens of a search and matching model and decompose the wedge into exogenous separation,

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[1] For micro heterogeneity see Chang and Kim (2007) and Takahashi (2014). Non-competitive features of goods markets, such as input-financing constraints and monopolistic competition among firms, only affects the markups, i.e. the gap between MPL and wages, which is not empirically volatile enough to account for the whole labor wedge.

http://dx.doi.org/10.1016/j.euroecorev.2014.02.008
0014-2921/

bargaining, and matching shocks.[2] We use the business cycle accounting methodology to evaluate their quantitative importance.

Our accounting exercise leads us to a striking conclusion: 49% of variations in the labor wedge are attributed to the matching shock. Other commonly used frictions, such as endogenous variations in job destruction and wage stickiness, play a smaller role in determining the labor wedge, accounting for 28% and 23% respectively. The decomposition of unemployment is asymmetric in the opposite direction. Matching shocks account for only 16% of unemployment fluctuations while the other two labor frictions jointly explain 54%.

This implies that the forces that drive unemployment are quite different from those that drive the labor wedge. In particular, imperfections in the job destruction and bargaining processes commonly considered in the search literature are not very helpful in explaining the labor wedge but they are important for understanding unemployment. Likewise, the matching friction explains half of variations in the labor wedge but it is not nearly as important for unemployment. As a result, if the labor wedge is motivated by search and matching frictions, then it is relevant for explaining unemployment mainly through changes in matching efficiency.

Our modeling approach augments the representative agent business cycle model with a search and matching friction in the spirit of Merz (1995) and Andolfatto (1996). The standard assumption that labor is traded in a spot market is replaced by a search friction which puts an additional constraint on how much labor can be employed. Differently from their approach, our model endogenously determines the level of unemployment, the number of vacancies and the labor force participation rate.

To model the frictions mentioned above we introduce three shocks which jointly determine the labor wedge in the model: the *separation shock*, the *matching shock* and the *bargaining shock*. The separation shock represents the proportion of employed workers that get separated from their jobs every period. The matching shock represents the efficiency of the matching technology. The bargaining shock represents the proportions in which the lifetime surplus of a newly formed match is split between the worker and the firm and thus pins down wages.[3]

To evaluate the relative importance of each shock we use the business cycle accounting methodology employed in Cole and Ohanian (2002) and CKM. For identification purposes, in addition to three labor market shocks, our model includes a TFP shock, an investment shock, and a government consumption shock. We use data on real GDP, consumption, investment, hours, unemployment and vacancies to recover the six shocks: TFP, investment, government consumption, separation, matching and bargaining. We use the model as a diagnostic tool and measure the contributions of each shock to each of the six variables by running a counterfactual exercise: we feed the shocks back into the model one at a time and all but one at a time.

As mentioned earlier, from the counterfactual exercise we conclude that there is an asymmetric effect of labor market frictions on the labor wedge and unemployment. While the labor wedge is to a large extent explained by changes in the matching efficiency, unemployment cannot be successfully explained without the interaction of the matching, separation and bargaining shocks.

Our results indicate that a labor market friction largely responsible for variations in the labor wedge must be isomorphic to changes in matching efficiency. This broad class of frictions includes variations in per capita costs associated with creating jobs, variations in time and effort devoted to search by unemployed workers, variations in the level of congestion, and variations in the degree of competition between peers characterizing the matching process.

Note that our results may also point toward an alternative interpretation of the labor wedge. The fact that our model attributes most of the variations in the labor wedge to matching efficiency may be a sign of misspecification of the real business cycle model as discussed by Chang and Kim (2007) and Pescatori and Tasci (2011). We consider this an important area for future research.

The paper is organized as follows. Section 1 lays out the theoretical framework and introduces the six shocks, Section 2 describes the methodology we use to estimate the model and recover the shocks, Section 3 explains the results, and Section 4 concludes.

1. Theoretical framework

This section lays out the setup of the model. We modify the standard one sector real business cycle model by adding a search technology for moving labor between productive activities and leisure in the spirit of Merz (1995) and Andolfatto (1996). However, it is well known that introducing search frictions is not enough to explain fluctuations in labor market variables. In order to do that we have to allow for a richer environment.

There are three major adjustments to the search and matching framework which have proven useful for explaining labor market fluctuations. First, Fujita and Ramey (2009) show that variations in the rate of job destruction are empirically relevant for explaining the behavior of the unemployment rate. Second, Hall (2005a) has shown that variations in the bargaining power of workers, generated, for instance, by wage-stickiness, can help explain the volatility of unemployment

[2] Like wedges in CKM, the three additional shocks in our model may represent labor market distortions rather than primitive sources of shocks. For this reason, we use the words “frictions” and “shocks” interchangeably.

[3] Note that wage rigidities proposed by Hall (2005a) and Shimer (2010) are one particular case of variations in the bargaining power we consider.