



Demand and supply effects of bargaining power shocks

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ABSTRACT

In times of crisis, social partners may consider a temporary decline in wages as a necessity to maintain employment. This paper studies the opposing demand and supply effects following declining bargaining power of workers in a New-Keynesian model with search and matching in the labour market. Lower labour income reduces aggregate demand in the presence of credit-constrained consumers. The main result is that falling bargaining power contracts output notably when monetary policy is constrained by the zero lower bound or when agents' expectations about the persistence of the shock adjust slowly.

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1. Introduction

The cost of labour is an important determinant of employment and economic activity. In times of crisis, such as the Great Recession for instance, calls to reduce the wage component of labour costs are more frequent especially when traditional counter-cyclical policies are less effective. Since the beginning of the financial crisis, high public debt levels limit counter-cyclical fiscal policies and the zero lower bound restricts monetary policy. As a consequence, unions are subject to external pressure to accept lower wages in order to maintain employment, thereby lowering their bargaining power. However, wages also represent an income, sustaining aggregate demand.

This paper analyses the opposing effects on aggregate demand and aggregate supply of a negative shock on the bargaining power of workers in a New-Keynesian model with search and matching in the labour market.² The inclusion of credit-constrained consumers creates a feedback mechanism from labour incomes to consumption demand. This paper shows that falling bargaining power of workers is most likely to have negative effects when monetary policy is ineffective or when agents adjust their expectations slowly. The shock sensitivity of these effects is studied using both mathematical analysis as well as simulation analysis.

Shocks to bargaining power have multiple impacts on macroeconomic variables. By altering wages, bargaining power shocks directly affect labour demand, consumption decisions and inflation. In the

business cycle literature, the real wage is an important determinant of unemployment. In New-Keynesian models with search and matching frictions and bargaining over income distribution a decline in the real wage increases output and employment. The main reason is that lower wages increase labour demand by firms. Since the surplus from an additional match accruing to firms increases, firms have an incentive to post more vacancies. A strong supply side effect follows, raising output. Galí et al. (2011) provide a similar treatment of the role of wages, claiming that excessive wage mark-up was the main cause of the increase in unemployment in the 1970s and early 1980s as well as a significant factor contributing to the rise in the unemployment rate in 2011. It follows that traditional New Keynesian models advocate a fall in wages to achieve higher output since they consider real wages only as a cost factor in the model, not as an important source of income. The representative agent earns all income and is indifferent as to its source.

The model presented in this paper explicitly allows for household heterogeneity in an otherwise standard New Keynesian model with search and matching in the labour market and Nash bargaining over wages through the introduction of rule of thumb consumers, thereby providing a direct feedback channel from labour income to aggregate demand. Consequently, a bargaining power shock can produce opposing effects, which are reinforced when monetary policy is ineffective or when agents expect the shock to diminish quickly again.

Mankiw (2000) calls for the introduction of credit constrained households in macroeconomic models, arguing that consumption smoothing is far from perfect and that many people in fact have net worth near zero. Rule of thumb households, representing a specific type of credit-constrained household with a zero borrowing constraint, have consequently been introduced in mainstream economic models by many authors to discuss the effects of fiscal policy (see for example Galí et al., 2007; Ratto et al., 2009; Cogan et al., 2010). Bosc et al. (2011)

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² Examples of standard New-Keynesian models with search and matching includes Hall (2005), Moyen and Sahuc (2005), Shimer (2005), Ravenna and Walsh (2008), Gertler and Trigari (2009), and Sala et al. (2008).

recently have combined rule of thumb households and search and matching, although they utilize a flexible price setup. They underline that the combination of the two mechanisms better accounts for the characteristics of the US labour market. Rule-of-thumb households are also justified by empirical evidence showing that financial wealth is heavily concentrated in the top income deciles (Atkinson et al., 2011).

Iacoviello (2005) endogenizes the borrowing constraint of impatient households by introducing a collateral constraint related to housing wealth in an extended financial accelerator model as by Kiyotaki and Moore (1997).³ This constraint is always binding, but can vary in real terms in face of inflation, thereby acting as an accelerator of demand and a decelerator of supply shocks. Since a negative bargaining power shock represents at the same time a positive supply and a negative demand shock, the endogenous housing collateral constraint would even reinforce the main conclusion of this paper. In order to maintain clarity of exposition, the simple rule of thumb framework is used.

Monetary policy is central to the impact of bargaining shocks as changes in wages are translated into changes in inflation and interest rate. The paper introduces the possibility of a liquidity trap implemented with a lower bound on the nominal interest rate, as in Christiano et al. (2009). In a liquidity trap, a shortage of demand, causing deflation, cannot be met by a fall in the nominal interest rate. As a result, the real interest rate rises, further lowering consumption and investment demand. This paper shows that the negative aggregate demand effect caused by lower workers' bargaining power far outweighs the positive supply effects in a liquidity trap. Section 3 shows that the mechanisms underlined in this paper are also relevant in the absence of a zero lower bound. However, the liquidity trap amplifies the mechanism at work.

Furthermore, the strength and duration of a bargaining shock depend on the expectation regarding the persistence of the shock. The more permanent is the shock, the faster is the adjustment of agents regarding spending decisions and the stronger is the supply side effect. This paper considers the case where expectations of agents are slowly adjusting. Agents initially believe that the bargaining shock is short lived, although the shock is more persistent. Agents adjust their expectation over a given time frame. This paper shows that the effect of a drop in the bargaining power has long lasting effects on output and employment when expectations are adjusting slowly, independently of the existence of a zero lower bound in monetary policy. This case constitutes an alternative mechanism to expectation formation. Existing alternative treatments of expectations include the heterogeneous agent literature (Brock and Hommes, 1997; Chiarella, 1992; De Grauwe and Kaltwasser, 2012) or nonlinear model predictive control methods (Ernst and Semmler, 2013; Gruene et al., 2013) for instance.

Both the empirical and the theoretical literature point to the importance of bargaining shocks. Christoffel et al. (2009) find that bargaining shocks explain 8% of output fluctuations in the short run and 16% of output fluctuations in the long run since they feed through wages directly despite price and wage rigidities.⁴ Using an extension of the Smets and Wouters (2011) model estimated for the US economy, Galí et al. (2011) show that wage markup shocks contribute significantly to output fluctuation in the short run and are the main driver of employment and unemployment fluctuations. Additionally, the importance of wage markup shocks is enhanced the longer the time period considered.⁵

³ Mora-Sanguinetti and Rubio (2014) implement this collateral constraint in a New Keynesian model to study the impact of the Spanish housing market reform.

⁴ Bargaining shocks explain 8% of output fluctuations in the short run behind risk premium shocks (60%) and monetary policy shocks (15%) far ahead of technology shocks (5%). Bargaining shocks explain 16% of output fluctuations in the long run behind risk premium shocks (48%) and ahead of monetary policy shocks (12%) and technology shocks (9%). Bargaining shocks also explain 12% of the forecast error variance of inflation in the short and medium run.

⁵ Wage markup shocks are synonymous with bargaining shocks in their paper. At 10 quarters horizon, wage markup shock is the third most important shock to account for output fluctuations (6%) and is the most important shock to account for fluctuation in employment (18%) and unemployment (41%). At 40 quarters horizon, wage markup shocks explain 17% of output fluctuations and 80% of employment fluctuations.

Numerous papers reinforce the conclusion that labour market shocks are an important driver of business cycles. Justiniano and Michelacci (2011) estimate a RBC model with search and matching for the US and 5 European countries. They find that there is large cross-country variation in the contribution of technology shocks to labour market fluctuation. Technology shocks work well in the US but results are mixed in Europe. Matching shocks and job destruction shocks play a larger role in Europe.⁶ Ravn and Simonelli (2008) show that technology and policy shocks have difficulties explaining some features of labour market adjustment over the business cycle.⁷

Only few papers investigate non-standard effects of bargaining power in the DSGE literature. In a theoretical paper, Kumhof et al. (2014) break the assumption of the representative agent and find that workers react with increasing indebtedness to a fall in their bargaining power, which eventually can cause an economic crisis. In contrast to this paper, Kumhof et al. (2014) disregard the employment effect associated with lower wages as well as the aggregate demand effects by using a highly stylized model. Within a static model with aggregate demand and unemployment Michailat and Saez (2013) show that an increase in wages may stimulate aggregate demand and reduce unemployment. Additionally, the strand of literature utilizing intra-firm bargaining based on Stole and Zwiebel (1996a, 1996b) also finds an employment enhancing effect of higher bargaining power. However, the effect is not due to demand considerations but follows as a supply side response. Following an increase in bargaining power, firms over-employ strategically in order to reduce the marginal product of labour, thereby reducing their marginal cost (see Cahuc et al., 2008, for an extensive treatment).

Section 2 presents the mathematical derivation of the model used. In Section 3, a stylized version of the model is solved analytically in order to precisely identify the key transmission channels and parameters. Section 4 outlines the calibration of the medium scale model and shows that the results discussed in Section 3 also holds in the medium scale model. Finally, Section 5 concludes.

2. Model

This section represents a closed economy New-Keynesian model using a standard setup of Calvo (1983) price stickiness, a search and matching labour market and varying capital. A non-standard but widely used feature is the presence of rule-of-thumb households.

2.1. Labour market

The labour market is modelled with search and matching frictions, where at the beginning of a period firms post vacancies v_t to recruit workers out of the beginning of period pool of unemployed u_t . New matches m_t are given by the standard matching function $m_t = \xi_m v_t^\eta u_t^{1-\eta}$. Labour market tightness is defined as $\theta_t = \frac{v_t}{u_t}$, the probability to fill a vacancy as $q_t = \frac{m_t}{v_t} = \xi_m \theta_t^{\eta-1}$ and the probability to find a job when unemployed as $\nu_t = \frac{m_t}{u_t} = \xi_m \theta_t^\eta$. Workers from all households have equal characteristics on the labour market. Therefore, they face equal probabilities of finding a job, have equal employment rates n_t and equal wages w_t .

At the end of a period, only a fraction ρ keeps their job, the rest goes into unemployment and searches for a new job in the next period. The beginning of period unemployment is given by new and old

⁶ Matching shock accounts for 50(30)% of cyclical fluctuations in unemployment in Great Britain (France), while job destruction shock accounts for 25(50)%.

⁷ Ravn and Simonelli (2008) apply a SVAR methodology to US quarterly data and consider four shocks: neutral and investment specific technology shocks as well as monetary policy and fiscal spending shocks. These shocks explain no more than 20% of the real wage and labour productivity forecast error variance.

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