



Labor market institutions and aggregate fluctuations in a search and matching model

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ARTICLE INFO

Article history:

Received 16 October 2006

Accepted 18 October 2010

Available online 3 November 2010

JEL classification:

E24

E32

E52

J64

Keywords:

Labor market institutions

Search and matching

New Keynesian model

Business cycles

ABSTRACT

This paper explores the influence of labor market institutions on aggregate fluctuations. It uses a dynamic, stochastic, general equilibrium model characterized by search and matching frictions in the labor market and nominal rigidities in the goods market. It finds that firing costs and unemployment benefits can have substantial effects on aggregate fluctuations. Increasing firing costs decreases the volatility of output, employment, and job flows due to the reduction in the mass of jobs sensitive to disturbances and lower incentives for firms to hire and fire workers. Hence, firms adjust to shocks mainly through prices, causing inflation to become more volatile. Raising unemployment benefits has the reverse effect on aggregate fluctuations.

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1. Introduction

Labor market institutions play an important role in the macroeconomic performance of an economy.¹ In principle, the structure of the labor market influences the long-run equilibrium of an economy and therefore the way in which macroeconomic aggregates fluctuate over time. The literature extensively focuses on the impact of labor market institutions on the underlying structural features of the economy,² but as detailed below, only a few papers have studied their impact on business cycle fluctuations. Of those, none has used a general equilibrium search and matching model of the labor market, nor have any of them incorporated nominal rigidities in the analysis.

In this paper, I take this task. The main question is: how do labor market institutions affect aggregate fluctuations? To answer this question, I employ a dynamic stochastic general equilibrium (DSGE) model with search frictions in the labor market and nominal rigidities in the goods market.

I assess the quantitative implications of labor market institutions by studying the effects of unemployment benefits and firing costs. Unemployment benefits are modeled as payments that accrue to workers after separations, whereas firing costs are modeled as “firing taxes” that firms pay when a worker is dismissed. To make a quantitative assessment of how these labor market institutions influence aggregate fluctuations, I calibrate the benchmark economy to UK data. I then compare the implications of the benchmark economy to a situation where firing costs and unemployment benefits increase from their

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¹ See Bertola et al. (2002), Layard and Nickell (1999), Nickell (1997), and papers in Snower and de la Dehesa (1997).

² See the survey by Mortensen and Pissarides (1999) and Pissarides (2000, Chapter 9).

benchmark calibration. For each of these changes, I analyze the effects on the steady-state equilibrium and business cycle dynamics.

In this model, the rate of job destruction is sensitive to idiosyncratic shocks affecting the firms. This is consistent with the empirical evidence given by [Davis et al. \(1996\)](#). Here, as in [Mortensen and Pissarides \(1994\)](#), in some of the cases in which firms face idiosyncratic productivity shocks, production is profitable, but in some others it is not. The firm chooses an equilibrium reservation productivity wherein jobs become profitable and jobs where productivity falls below this threshold are destroyed. As described in [Moscarini \(2005\)](#) empirical evidence suggests that the wage distribution has a log-normal distribution. The main consequence of this choice is that, as documented below, because the equilibrium threshold is below the mode of the distribution, depending on how labor market institutions affect the threshold, the number of jobs vulnerable to destruction would either increase or decrease and this would serve either to magnify or suppress the effect of labor market institutions on aggregate fluctuations. Hence, I undertake a robustness analysis exercise to assess how the critical threshold interacts with firing costs and the replacement ratio to produce the results.

The results suggest that an increase in firing costs decreases the volatility of output, unemployment, employment, and flows both in and out of employment, whereas the volatility of inflation, real wages, and the vacancy-unemployment ratio, referred to as labor market tightness, all increase. The presence of firing costs affects the inter-temporal employment decisions of firms, since an increase in current employment exposes firms to firing costs in the future. This induces firms to decrease layoffs and hiring, leading to higher unemployment duration and lower unemployment incidence. The mass of jobs sensitive to deterioration in the economy decreases, and thus, disturbances displace a lower number of workers. Since quantities are more costly to change and disturbances affect a lower number of jobs, firms adjust to shocks through prices, changing them aggressively. Hence, inflation becomes more volatile. An increase in unemployment benefits has the opposite effect.

As mentioned earlier, much of the existing analysis of labor market institutions has tended to focus on their impact on the deterministic equilibrium of the economy, with the business cycle consequences largely ignored. [Millard and Mortensen \(1997\)](#) and [Mortensen and Pissarides \(1999\)](#) analyze the impact of different labor market institutions on the steady-state of unemployment and output. Similarly, [Chari et al. \(2005\)](#) build on the labor matching framework to study the connection between labor institutions and investment in training. [Alvarez and Veracierto \(1999\)](#) explore the extent to which labor market policies can explain differences in employment across economies using a Lucas–Prescott equilibrium search model. [Alonso-Borrego et al. \(2005\)](#) evaluate specific labor market reforms such as temporary contracts and firing costs in a model with heterogeneous agents and labor search. Finally, [Yashiv \(2004\)](#) explores the consequences of macroeconomic policy for labor market outcomes in a partial-equilibrium model. I extend this line of research to a general equilibrium setting with a more comprehensive structure of the labor market, which is capable of analyzing a broader set of dynamics. All these papers limit their analysis to the deterministic equilibrium of the economy and do not consider nominal variables such as inflation. In contrast, this paper computes the full-blown stochastic equilibrium and accounts for nominal variables. [Veracierto \(2008\)](#) performs a general equilibrium analysis of the effects of firing taxes on cyclical fluctuations. However, he employs a real business cycle model that does not incorporate labor frictions, nor does it account for either inflation dynamics or nominal disturbances. This paper allows for both these features so as to capture the more detailed dynamics of the labor market in the economy.

This paper is not the first work that combines a New Keynesian setting with search and matching frictions in the labor market. An increasing number of papers, such as those by [Christoffel and Linzert \(2010\)](#), [Krause and Lubik \(2007\)](#), [Trigari \(2009\)](#), and [Walsh \(2005\)](#), use the search framework to incorporate labor market frictions into a monetary economy and find that they improve the ability of the standard New Keynesian framework to replicate the observed dynamics of unemployment and inflation. This paper uses a similar setting, but unlike any of these papers, incorporates labor market institutions and investigates their effect on aggregate fluctuations and in particular, on inflation. Hence, the contribution of this paper is twofold. First, it extends the standard search and matching framework by analyzing the effect of labor market institutions on aggregate fluctuations using a full-blown general equilibrium setting. Second, using a New Keynesian setting enriched with search and matching frictions, it explicitly focuses on labor market institutions and their influence on inflation.

The remainder of the paper is organized as follows: Section 2 sets up the model; Section 3 defines the equilibrium and presents the solution method; Section 4 describes the baseline calibration; Section 5 discusses the findings and performs robustness analysis; and finally, Section 6 presents the conclusion.

2. The model

The model resembles those used by [Krause and Lubik \(2007\)](#) and [Walsh \(2005\)](#), which embed the labor market specification of [den Haan et al. \(2000\)](#) into a New Keynesian setting.³ This paper develops this framework by adding two specific labor market institutions: unemployment benefits and firing costs. The set-up describes the behavior of a representative household, a production sector comprised of a representative intermediate goods-producing firm, a continuum of retail firms indexed by $i \in [0, 1]$, and a central bank.

³ As detailed below, in this paper the labor market specification is closer to that described by [Walsh \(2005\)](#).

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