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Optimal unemployment insurance in an equilibrium business-cycle model

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ABSTRACT

The optimal cyclical behavior of unemployment insurance is characterized in an equilibrium search model with risk-averse workers. Contrary to the current US policy, the path of optimal unemployment benefits is pro-cyclical – positively correlated with productivity and employment. Furthermore, optimal unemployment benefits react non-monotonically to a productivity shock: in response to a fall in productivity, they rise on impact but then fall significantly below their pre-recession level during the recovery. As compared to the current US unemployment insurance policy, the optimal state-contingent unemployment benefits smooth cyclical fluctuations in unemployment and deliver substantial welfare gains.

1. Introduction

How should unemployment insurance (UI) respond to fluctuations in labor productivity and unemployment? This question has gained importance in light of the high and persistent unemployment rates following the 2007–2009 recession. In the United States, existing legislation automatically extends unemployment benefit duration in times of high unemployment. Nationwide benefit extensions have been enacted in every major recession since 1958, including the most recent one, in which the maximum duration of unemployment benefits reached an unprecedented 99 weeks. The desirability of such extensions is the subject of an active policy debate, which has only recently begun to receive attention in economic research. In this paper, the optimal cyclical behavior of unemployment insurance is characterized using an equilibrium search model.

The approach integrates risk-averse workers and endogenous worker search effort into the workhorse Diamond–Mortensen–Pissarides model, with business cycles driven by shocks to aggregate labor productivity. The key motivation for using the Diamond–Mortensen–Pissarides model is to explore the consequences of general equilibrium effects for the optimal design of UI policy over the business cycle. The equilibrium search approach is ideal for studying these effects: it accounts for the possibility that more generous unemployment benefits not only discourage unemployed workers from searching, but also raise the worker outside option in wage bargaining, thereby discouraging firms from posting vacancies. Although the framework is a classic one, commonly used to study labor market dynamics and policies, the normative implications of this framework – such as optimal UI – are still very much an open question and need to be more fully understood. Our paper is a step within this research agenda.

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The optimal state-contingent UI policy is the solution to the Ramsey problem of the government, taking the equilibrium conditions of the model as constraints. Specifically, the government chooses the generosity of unemployment benefits (level and duration) optimally over the business cycle, and can condition its policy choices on the past history of aggregate productivity shocks. The main result is that the optimal benefit schedule is *pro-cyclical* over long time horizons: when the model is simulated under the optimal policy, optimal UI benefits are positively correlated with labor productivity and negatively correlated with the unemployment rate. This overall pro-cyclicality of benefits, however, masks richer dynamics of the optimal policy. In particular, the optimal policy response to a one-time productivity drop is different in the short run and in the long run: optimal benefit levels and duration initially rise in response to a negative shock, but both subsequently fall below their pre-recession level. Thus, the behavior of optimal benefits in response to productivity is non-monotonic, and the fall in benefit generosity lags the fall in productivity. The intuition for these dynamics of the optimal policy is that the initial fall in productivity lowers the gains from creating additional jobs, hence the opportunity cost of raising the generosity of UI benefits is low. On the other hand, the subsequent rise in unemployment raises the social gains from posting vacancies but does not raise the private incentives for doing so. As a consequence, UI generosity optimally rises initially in response to a productivity drop, but then quickly falls in response to the subsequent rise in unemployment.

Compared to current US policy, in the short run (beginning of a recession) the optimal policy coincides with the practice of extending benefits. Where the policies diverge is that US policy typically extends benefits throughout the recession and for years well into the subsequent recovery. This results in a much slower recovery of employment as compared to the optimal policy.[1] The fact that the optimal policy accelerates the recovery of employment indicates that the distortionary effects of increasing benefit generosity in the short run are outweighed by the commitment from the government to lower them in the future.

Our paper contributes to the literature on optimal policy design within search and matching models, which emphasize that policy affects firm vacancy creation decisions. It is thus in the tradition of the general equilibrium approach to optimal unemployment insurance, exemplified by Cahuc and Lehmann (2000), Fredriksson and Holmlund (2001), Coles and Masters (2006), and Lehmann and van der Linden (2007). The novelty of our analysis is to determine how unemployment insurance should optimally respond to business cycle conditions, rather than analyzing optimal policy in steady state.

Our paper also contributes to the emerging literature on optimal unemployment insurance over the business cycle. Three recent papers in this literature are Kroft and Notowidigdo (2010), Landais et al. (2013), and Jung and Kuester (2014). Kroft and Notowidigdo (2010) examine optimal state-contingent UI in a principal-agent framework, extending the approach of Baily (1978), Shavell and Weiss (1979), Hopenhayn and Nicolini (1997), and Shimer and Werning (2008). This approach focuses on the tradeoff between insurance and incentive provision for an individual unemployed worker, but abstracts from the effects of policy on firm hiring decisions. Landais et al. (2013) incorporate firm hiring decisions into their model, but these decisions do not respond to UI policy because wages do not depend on the workers' outside option.[2] Finally, like our paper, Jung and Kuester (2014) examine optimal policy in a modified Diamond–Mortensen–Pissarides framework. There are differences between the two papers in terms of restrictions on policy instruments used. For example, Jung and Kuester (2014) allow both unemployment benefits and taxes to be business cycle dependent, but do not allow unemployment benefits to expire.[3] In addition, Jung and Kuester (2014) depart from the standard framework by introducing shocks to worker bargaining power that are negatively correlated with productivity. As a result, similar to Landais et al. (2013), firm hiring decisions are less responsive to changes in unemployment benefit policy in recessions. Overall, our findings serve to illustrate that the choice of modeling framework, in particular the presence or the absence of general equilibrium effects, can have drastic implications for optimal policy. Our results on the pro-cyclicality of optimal unemployment benefits and their dynamics in response to shocks are new to this literature.

The paper is organized as follows. The model is presented in Section 2. Section 3 describes the calibration strategy. Section 4 defines the optimal policy and contains the main optimal policy results. In Section 5, we discuss our results and conduct sensitivity analysis.[4] Finally, Section 6 concludes.

2. Model description

The model is a Diamond–Mortensen–Pissarides model with aggregate productivity shocks. Time is discrete and the time horizon is infinite. The economy is populated by a unit measure of workers and a larger continuum of firms.

[1] Recent research by Mitman and Rabinovich (2014) points to benefit extensions as a possible explanation for the “jobless recoveries” that occurred after the last three recessions in the US.

[2] In Section 5.2.2, we compare our model to the model in Landais et al. (2013) in terms of testable predictions and discuss a way to distinguish between the two empirically.

[3] In Section 5.1, we examine the consequences of allowing taxes to be state-contingent, and show that this results in findings consistent with Jung and Kuester (2014).

[4] Additional sensitivity analysis and all derivations can be found in the supplementary materials available online.