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Understanding the welfare effects of unemployment insurance policy in general equilibrium

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ABSTRACT

This paper analyzes the welfare effects of unemployment insurance reforms in a general equilibrium incomplete market model. In particular, it decomposes the total welfare effect for each individual into different factors. I consider a model where the consumers face an uninsurable unemployment risk, can save in an interest-bearing asset, and are subject to a borrowing constraint. The labor market is modeled using a Diamond–Mortensen–Pissarides style search and matching model. The decomposition exercises reveal how each factor contributes to the heterogeneity of welfare effects among different consumers.

1. Introduction

Unemployment insurance (UI) allows consumers to cope with the risk of large fluctuations in income due to job loss. It provides a method of smoothing consumption while unemployed, particularly for consumers who are constrained in borrowing. Because this type of insurance is difficult to provide through the private market, UI has long been viewed as an important government policy. There has been a large amount of research devoted to analyzing the effect of government-provided UI, on both theoretical and empirical fronts.

In the past 30 years, many papers have been written on "optimal UI policy." These papers typically consider a set of available UI policy options, and select the "optimal" policy based on certain welfare criteria. Existing papers vary widely in terms of the environments they consider and the restrictions that they put on the available policy instruments. Some papers analyze environments with only one consumer,[1] some consider environments with many heterogeneous consumers,[2] and others construct a general equilibrium environment with production.[3] Some papers consider a fully duration-dependent UI benefit,[4]

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[1] For example, Shavell and Weiss (1979), Hopenhayn and Nicolini (1997), and Shimer and Werning (2008).
[2] For example, Hansen and İmrohoroğlu (1992), Abdulkadiroğlu et al. (2002), Joseph and Weitzenblum (2003), and Lentz (2009).
[3] For example, Costain (1999), Young (2004), and Krusell et al. (2010).
[4] For example, Shavell and Weiss (1979), Hopenhayn and Nicolini (1997), and Shimer and Werning (2008).

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some only consider a constant benefit with various levels,[5] and others analyze a benefit that is non-constant but has restricted flexibility.[6]

The quantitative papers differ substantially on their recommendation of the "optimal UI benefit."[7] The results depend on the details of the model, and the models typically involve many elements that are affected by the change in the UI benefit, so that it is difficult to identify which details are driving differences in the results. To learn from the models and draw lessons for actual policy making, it does not seem productive to simply list various numbers that are obtained from different settings. Rather, it is necessary to *understand* how these quantitative conclusions are drawn. By understanding what is behind these numbers, one can gain *intuitions* that are robust to the details of the model.

This paper contributes to this understanding. Instead of calculating the optimal UI scheme, I analyze the welfare effect of a simple UI reform that permanently increases the benefit from a baseline level. The model that I consider is a dynamic general equilibrium model with uninsured idiosyncratic unemployment risk. In particular, my model belongs to a class of models called Bewley–Huggett–Aiyagari models.[8] These models assume that consumers cannot insure against idiosyncratic risk directly, have access to an interest-bearing asset (and thus are able to self-insure), and are subject to a borrowing constraint. One notable aspect of the model is that consumers are heterogeneous with respect to employment status and asset levels at a given point in time. This makes it difficult to evaluate the welfare effects of a policy change—the welfare effects for a particular consumer depend on her individual state at the time of the policy change.[9] The analysis in this paper describes the individual-level welfare effects and *decomposes* them into various factors. The novel contribution of this paper is this decomposition analysis.[10] As will become clear, this decomposition makes it possible to understand the intuitions in these complex dynamic general equilibrium models with heterogeneous agents.

The model endogenizes the labor market using Diamond–Mortensen–Pissarides-style search and matching model (Pissarides, 1985). This type of model has been used for the analysis of UI in several papers in the past. Examples include Pollak (2007), Reichling (2007), Krusell et al. (2010), Vejlin (2011), Kristoffersen (2012), and Nakajima (2012). The model in this paper is mainly based on Krusell et al. (2010). The main difference here from the analysis of Krusell et al. (2010) is that I explicitly consider transition dynamics, whereas they focus on steady-state comparison. It turns out that considering these transition dynamics is essential to properly analyze the welfare effect of the policy reform.

The quantitative model shows that the welfare gain from reforms that increase the UI benefit is higher for a consumer who is unemployed at the time of reform than for a consumer who is employed. The gain also tends to be decreasing in the level of wealth at the time of reform. The decomposition exercise reveals which factors contribute to these patterns. For the first pattern, the main reason is that the policy reform implicitly includes a transfer of expected future income from employed consumers to unemployed consumers. There is another effect in the opposite direction that works through a change in job-finding probability, but quantitatively it is dominated by the effect of this implicit transfer. The second pattern is affected by three different factors. First, a poor consumer benefits more from a better opportunity for consumption smoothing—this is the insurance effect of a more generous UI. Second, the return on assets declines for a significant period after reform, hurting asset-rich consumers more than asset-poor consumers. The third effect works in the opposite direction—a decline in job-finding probability hurts a poor worker more, since they rely more on the labor income. Quantitatively, this effect is dominated by the first two. It turns out that the second effect through asset returns occurs during the transition to the new steady-state, and a steady-state comparison would yield the opposite conclusion about the welfare effect of the change in asset returns. There, an endogenous movement of the labor market also plays a crucial role.

The paper is organized as follows. The next section builds the model and carries out the main analysis. Section 3 concludes.

2. Model

The model setup is similar to Krusell et al. (2010). The asset market is incomplete and consumers can hold only one type of asset, which is not contingent on individual idiosyncratic shocks. The asset is a combination of the capital stock and a claim to the profit (dividend) of the representative firm—these two yield identical returns because the rental rate of capital and the profit of the representative firm both depend only on the aggregate situation of the economy (and there are no aggregate shocks). The labor market has a Diamond–Mortensen–Pissarides style structure (Pissarides, 1985): the representative firm posts vacancies and receives profit from the jobs which are matched to the workers. The wages are determined by Nash bargaining. In this framework, the wage depends on the asset level of the worker. The government finances the

[5] For example, Hansen and İmrohoroğlu (1992), Young (2004), and Krusell et al. (2010).

[6] For example, Abdulkadiroğlu et al. (2002).

[7] For example, Hansen and İmrohoroğlu (1992) calculate the optimal replacement rates of 0.65–0.05 depending on the degree of moral hazard, Wang and Williamson (2002) suggest 0.24 (when the benefit is perpetual) as optimal with one type of workers, Young (2004) recommends zero unemployment insurance, and Lentz (2009) finds the optimal replacement rates of 0.76–0.27 depending on the worker's state.

[8] See Bewley (ND), Huggett (1993), and Aiyagari (1994).

[9] One can imagine that this heterogeneity in welfare effects has politico-economic consequences: in a majority-voting setting, for example, a policy reform is taken up when the majority of voters benefit from the reform. Pallage and Zimmermann (2001) analyze a voting equilibrium in a model similar to Hansen and İmrohoroğlu (1992), where the voting decision is based on a steady-state welfare comparison.

[10] In the context of a social security reform, Conesa and Krueger (1999) conduct an experiment with "fixed prices," which corresponds to my "partial equilibrium experiment."