Labour Economics 36 (2015) 1–17

Contents lists available at ScienceDirect

Labour Economics

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

Optimal unemployment insurance: When search takes effort and money☆

J. Schwartz *

Loyola University Maryland, Department of Economics, 4501 North Charles Street, Sellinger 315, Baltimore, MD 21210, United States

HIGHLIGHTS

- I develop a model where finding work requires effort and monetary expenses.
- The model assumes search effort, savings, and search capital are hidden actions.
- I use the model to determine the optimal unemployment insurance (UI) policy.
- Without savings high upfront benefits is optimal so search expenses are affordable.
- With savings UI should be high for the long-term unemployed.

ARTICLE INFO

Article history:
Received 3 April 2013
Received in revised form 11 May 2015
Accepted 5 July 2015
Available online 16 July 2015

JEL classification:
J64
J66
D82

Keywords:
Unemployment insurance
Moral hazard
Hidden information
Unemployment
Search

ABSTRACT

Searching for work is costly. It involves finding available positions, completing applications, and attending interviews, to name but a few of the activities involved. The optimal unemployment insurance (UI) literature models the cost of these activities as either a reduction in leisure or an unpleasant bad that reduces utility, ignoring their associated monetary costs. If search requires out of pocket expenses on goods and services that improve the probability of a successful job search, a low UI benefit may make a job search unaffordable. This paper investigates the optimal structure of UI in an economy where job search is not only unpleasant, but also requires a monetary investment. Numerical experiments suggest that without access to capital markets, the optimal UI system should include a higher benefit for the newly unemployed than is implied by assuming a job search is free. This allows workers to purchase the stock of goods and services needed to find work. In contrast, when workers can accumulate savings, more benefits should be provided to the long-term unemployed, so they have the financial resources needed to conduct a job search even as they exhaust their own savings.

1. Introduction

Searching for work is a costly endeavor. The process involves a set of fairly unpleasant activities, such as searching through help wanted advertisements, preparing resumes and applications, and attending interviews. Modelers interested in the search process, and in particular the optimal design of unemployment insurance (UI), incorporate these costs as either a loss of leisure time or an intangible bad that reduces utility. To date, the literature largely ignores the out of pocket expenses that are required to perform a search.

A job search not only requires some intangible effort, but a variety of goods and services ranging from transportation and professional attire for interviews to computing resources and paid recruiters. The degree to which monetary expenses are important to the job hunt raises a variety of new questions on how to best design a UI system. For instance, does assuming that job search is costly, rather than free, suggest that benefits should be higher early in an unemployment spell so job seekers can purchase an initial stock of the items that are required for a successful job search? Or, alternatively, should UI benefits be low so workers are incentivized to self-insure against an employment shock by maintaining a stock of these goods and services while employed? Finally, should benefits be higher for the long-term unemployed so they may continue to have the financial resources to find a job even after they

☆ I would like to thank the Loyola University of Maryland Sellinger Business School for their generous financial support.

* Tel.: +1 410 617 2919.
E-mail address: jsschwartz1@loyola.edu.

http://dx.doi.org/10.1016/j.labeco.2015.07.002
0927-5371/

have exhausted their own savings? To answer these questions I investigate an economy where search reduces utility, both because it is unpleasant and because it diverts financial resources from consumption.

To explore the optimal design of UI, this paper develops a search model where workers' actions may be hidden from the government along three dimensions: (1) the intangible search effort they exert, (2) the financial resources workers devote to search, and (3) the degree workers use precautionary savings to self-insure against an employment shock. The first hidden action, the non-monetary, intangible effort exerted by the unemployed, I refer to simply as search effort.

Shavell and Weiss' (1979) and Hopenhayn and Nicolini (1997) seminal works on optimal unemployment insurance focus on the moral hazard problem that arises from not being able to observe search effort. Shavell and Weiss (1979) model maximizes worker utility subject to a fixed budget, while Hopenhayn and Nicolini (1997) use a recursive contract approach to determine the cost minimizing UI benefit and employment tax contingent on a worker's employment history. Both studies find that a UI benefit that declines with unemployment duration extracts a second best level of search effort from forward looking workers that wish to avoid a decline in their consumption. While these important papers, and many extensions to their models by other researchers, establish the optimal form of UI when workers must expend effort, they ignore the monetary costs of the search process.

In this paper I argue that search effort alone is an incomplete picture of the job search process. Finding a job also requires additional goods and services that increase the probability of obtaining employment, but do not increase the utility of the unemployed. For instance, locating job opportunities is not just unpleasant, but may involve transportation costs to inquire if positions are available. Filling out on-line applications cannot be done with effort alone, but one needs computing resources. In addition, moving to where jobs are more plentiful and obtaining certifications of technical expertise that signals one's qualifications are large monetary expenditures that improve the chances of finding employment.

These purchases may differ by socio-economic status. At the upper end of the wage distribution job searchers may pay for resume writing assistance, the help of recruiters, or networking opportunities, such as flying to professional conferences. At the lower end of the wage distribution the long-term unemployed may struggle to maintain professional attire, and email access, which are near necessities for a successful job search. Given the variety of goods and services needed for a successful job search, the associated monetary costs can be a substantial portion of the rather small average weekly UI benefit in the United States of just $291.[1]

Given these significant expenses I model search capital as a second action hidden from the government. While programs like Supplementary Nutritional Assistance Program (Food Stamps) suggest that governments may be able to monitor the purchases of beneficiaries, it is likely to be difficult to observe if an item is being used for a job search. For instance, a worker may fly to New York for a conference vital for her job search or simply for vacation, someone may move to North Dakota because jobs are more plentiful or to be close to family, and someone may use the internet to search help wanted ads or just for entertainment. Due to this ambiguity I assume that search capital is unobservable, but also explore cases where the government can monitor search capital in the sensitivity analysis sections of this paper.

The idea of search capital has thus far been largely ignored by the literature.[2] One exception is (Hassler and Mora, 2002), where workers may be short or long-term unemployed, search costs money, and workers may make an additional discrete investment to improve their exit rate from unemployment. Workers vary in the cost of this investment which gives rise to an adverse selection problem. Workers with a high cost of investment desire greater insurance against long-term spells. In order to incentivize low cost workers to make these investments and provide insurance to high cost workers, benefits are low early in the spell and rise for the long-term unemployed. While this paper's focus is on the moral hazard problem, it also builds upon Hassler and Mora (2002) by allowing for monetary costs of search as well as search effort. Further, unlike Hassler and Mora (2002), I allow for more than two periods of unemployment, which allows for the possibility of a non-monotonic optimal benefit schedule.

The last hidden action is private savings, which has long been shown to significantly affect the optimal UI policy. Flemming (1978) determines that an optimal replacement rate, provided for an infinite duration, goes from under 20% with perfect capital markets to over 70% when capital markets are nonexistent. Wang and Williamson (2002) find that it is optimal for benefits to be low in the first quarter of unemployment when workers' assets are high and then increase to provide insurance as assets are exhausted. Late in the unemployment spell UI should fall to provide incentives to search. Hansen and Imrohoroglu (1992) frame the moral hazard question in terms of the government's inability to monitor whether job offers and job continuations are accepted or rejected. Abdulkadiroglu et al. (2002) extend Hansen and Imrohoroglu (1992) model to allow for hidden savings. Abdulkadiroglu et al. (2002) find that it is optimal to pay large benefits upfront, which can be saved and used throughout the spell, and then keep benefits low while workers exhaust their savings. Benefits should then increase for the long-term unemployed to provide insurance for those with no remaining savings. Lentz (2009) estimates an empirical model of job search to determine the optimal UI replacement rate for Denmark where the duration of UI is nearly unlimited. The author estimates that the optimal replacement rate is between 43% and 80%. These studies suggest that savings can significantly influence the optimal UI schedule.

Since each of these actions are unobservable, a moral hazard problem arises where workers may provide a sub-optimal level of search effort, purchase too little search investment and accumulate too little precautionary savings, than the government would wish under a full insurance system. As a result, the UI program must play the role of both insuring workers against an employment shock, as well as incentivizing these behaviors. The government can do this by varying the timing of benefits based on a worker's current unemployment history, subject to a balanced budget constraint and the optimizing behavior of workers.

I develop, and numerically simulate, a search model under several scenarios: Scenario 1 allows for only search effort, Scenario 2 allows for search effort and search capital, Scenario 3 allows for search effort and private savings, and Scenario 4 allows for all three of these actions. The traditional wisdom of Shavell and Weiss (1979) and Hopenhayn and Nicolini (1997) holds for Scenarios 1 and 2 where it is optimal for benefits to fall throughout an unemployment spell. However, when relaxing the assumption that a job search is free, it is optimal to provide a much larger benefit at the beginning of an unemployment spell, so workers can purchase an initial stock of search capital.

Allowing for precautionary savings suggests a different policy recommendation. Here, rather than more benefits for the newly unemployed, assuming that job search has monetary costs implies more benefits for the long-term unemployed, who are in danger of exhausting their savings. I also find that the welfare improvement that occurs from moving to an optimal UI system is substantially higher, when one assumes that searching for work requires financial resources.

Sensitivity analysis shows that these conclusions are subject to how quickly search capital depreciates and the degree of risk aversion. If search capital depreciates slowly workers are willing to self-insure against unemployment by accumulating search capital while employed.

[1] The average weekly benefit amount reported by the Department of Labor for the first quarter of 2011.

[2] Note, Carrillo-Tudela and Smith (2012) recently use the term *search capital* to refer to the number of past contacts a job searcher has accumulated.