



## Social program substitution and optimal policy<sup>☆</sup>



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### HIGHLIGHTS

- More generous unemployment insurance (UI) reduces enrollment on disability insurance.
- Resulting cost savings to government raise optimal UI by about 50% in the US.
- Same logic applies to many other programs, countries and contexts.
- In general model, I solve for impact of any given transfer program on welfare.
- Depends on effects on distribution, tax base, and enrollment on other programs.

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### ABSTRACT

The large size and rate of growth of the US Disability Insurance (DI) system makes it important to understand the factors that influence the decision to apply for DI. In a context of imperfect DI screening, the generosity of other social programs can play a role in this decision, and one empirically relevant factor is the availability and generosity of Unemployment Insurance (UI) benefits. UI's impact on DI applications and enrollment has been ignored in welfare analyses of UI, but I show that it leads to significantly altered results: the optimal level of unemployment benefits increases by about 50%, as more generous UI prevents workers from applying for DI, with significant cost savings to the government. The same logic applies to a wide variety of other social programs and contexts, and in a more general model I show that the impact of any such program on welfare can be expressed in terms of its redistributive effect and its effects on the tax base and on enrollment on other programs.

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### 1. Introduction

Determining an individual's ability to work is a complicated and subjective process. This is one of the main lessons of Benitez-Silva et al. (2004), who find evidence of substantial classification errors by the US Social Security Administration: they estimate that 20% of approved applicants for disability insurance (DI) are not disabled,

while 60% of rejected applicants are in fact disabled. These findings indicate that disability is not a perfectly observable state, and that applying for disability insurance is, for many individuals, an economic choice which can be influenced by the attractiveness of the available alternatives. Therefore, it is important to understand the factors that enter the decision to apply for DI, and this is made particularly urgent by the size and rate of growth of the US DI system: in 2013, nearly 885 thousand new DI awards were made, bringing the total population of disabled worker beneficiaries to just over 8.9 million.<sup>1</sup>

One factor that appears to play a significant role in the decision to apply for disability benefits is the availability and generosity of

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<sup>1</sup> With about 6.5 million disabled worker beneficiaries and 832 thousand new awards in 2005, the title of Autor and Duggan (2006) described the situation at that time as "A Fiscal Crisis Unfolding."

other social insurance programs, particularly unemployment insurance (UI) among workers with a recent employment history. Petrongolo (2009), Lammers et al. (2013), and Lindner (forthcoming) document substitution between UI and DI in the UK, Netherlands, and the USA respectively: reductions in UI generosity or increases in job search requirements make individuals more likely to claim disability benefits.

However, this evidence has been ignored in welfare analyses of UI: a large literature on optimal unemployment insurance balances welfare gains of consumption smoothing with moral hazard costs, but ignores any impact of UI on other behaviors or outcomes. In this paper, I provide the first welfare analysis of unemployment insurance that accounts for substitution between UI and DI, and I demonstrate that the impact on the results can be significant. Extending the model from the seminal optimal UI paper of Baily (1978) to include disability, and using a plausibly small estimate of the substitution effect calculated for the United States by Lindner (forthcoming), I find that the optimal level of UI benefits increases by nearly 50%, from an optimal replacement rate of 0.33 to 0.48; more generous UI discourages workers from applying for and receiving DI, with significant cost savings to the government.

In a perfect world in which the government could costlessly identify workers' abilities and provide DI in appropriate amounts to individuals with reduced work capabilities, this effect would of course vanish: more generous UI would have no impact on receipt of DI benefits, as the latter would be exogenous. However, the evidence of substitution cited above, as well as the findings of Benitez-Silva et al. (2004), indicate that this is not the case; and if DI eligibility is imperfectly observed, and receipt is sensitive to UI generosity, then my results demonstrate that it is important to account for the observed substitution when considering optimal UI policy.<sup>2</sup>

The same logic can also apply to other social insurance programs, as well as other countries: in any setting in which eligibility for programs overlap, or in which eligibility cannot be perfectly observed, the optimal value of one program will generally depend on the magnitude of interactions with other programs. Empirical work has found evidence of substitution and/or complementarity between a variety of programs: Staubli (2011) and Borghans et al. (2014) find evidence of interactions between DI and other social insurance programs in Austria and the Netherlands, while Fortin and Lanoie (1992) is one of a number of papers finding substitution between UI and workers' compensation programs. This growing literature provides strong evidence that changing the generosity of one program affects enrollment and spending on other programs, even though social insurance programs are often designed to be mutually exclusive.

Just as in the case of UI and its impacts on DI enrollment, however, this evidence has been ignored in welfare analyses of social insurance<sup>3</sup>; the standard assumption when studying optimal policy for a particular social insurance program is that the program in question is the only

<sup>2</sup> An alternative policy question could be: what is the optimal disability screening regime? If the government could control the frequency of screening errors at some cost, the optimal DI screening intensity could be evaluated. Such an analysis would be interesting, though I am not aware of any estimates of how the effectiveness of screening would increase with the cost. However, it is beyond the scope of the current paper, and even if DI screening effectiveness was altered, my main result would still hold qualitatively, though exact quantitative results could move in either direction. I assume that the frequency of errors is exogenously fixed by nature – or equivalently that the government holds it fixed at the optimal value; this allows me to perform sufficient statistics analysis, in which I evaluate optimal UI using current empirical estimates of the relevant quantities.

<sup>3</sup> Li (2014) considers the welfare consequences of a fiscal interaction between two social insurance programs, but she focuses on a different channel from the one considered in this paper, using a calibrated model which implies that the US Affordable Care Act will improve health and thus reduce DI eligibility. Diamond and Sheshinski (1995) provide a theoretical examination of optimal DI in which a less stringent DI standard attracts some individuals from welfare or retirement benefits if DI is more generous, but changes in the generosity of DI benefits do not affect application or enrollment. Lawson (2014) incorporates estimated reductions in spending on social insurance and corrections into a welfare analysis of college tuition subsidies.

fiscal responsibility of government, and all other programs are ignored.<sup>4</sup> In a paper written concurrently with the present paper, Chetty and Finkelstein (2013) also discuss the possibility that social insurance programs can cause behavioral responses on choices other than the one insured by the program in question, and mention the interaction between UI and DI; however, they do not attempt to evaluate the consequences of this interaction for optimal UI policy, focusing instead on a simple example in which UI benefits affect individuals' decisions to accumulate taxable savings.

In a second-best world in which all developed countries have a patchwork quilt of social insurance programs, and in which there is necessarily substitution between programs depending on their generosity, analyzing optimal policy for one program and ignoring the rest could lead to inaccurate conclusions.<sup>5</sup> In the final section of the paper, I show how the analysis of the UI–DI case can be generalized to a broader setting with any number of state-contingent transfer programs. I solve a model based on Chetty (2006) for a derivative of social welfare with respect to the generosity of any individual program, with a simple and intuitive result that depends directly on estimable effects of that program on the tax base and on enrollment in other programs, as well as the redistributive impact of the program. I show that recognizing the full range of government programs causes the estimated optimal generosity of a transfer program to increase if and only if the effect of that program on the tax base is greater than its effect on spending on other programs. Finally, I examine some of the areas of research to which this approach could be applied, identifying important empirical and theoretical areas for future study.

This paper primarily contributes to literatures in three areas of research. First is the literature on optimal unemployment insurance, including papers such as Baily (1978), Hansen and Imrohoroglu (1992) and Chetty (2008). My results provide new evidence on the optimal generosity of UI, demonstrating that substitution between UI and other social insurance programs can have important quantitative effects on optimal UI policy. My analysis is also connected to the empirical literature on substitution between social insurance programs, as I show that the effects documented by Petrongolo (2009), Lammers et al. (2013), and Lindner (forthcoming) can have significant welfare consequences. Finally, a number of recent papers have sought to examine the optimal provision of social programs in more complex environments (that is, in the presence of a range of government programs or where programs can impact numerous outcomes) with sufficient statistical methods, such as Lawson (2013), Hendren (2013), and Chetty and Finkelstein (2013); my paper makes a contribution to this effort.

The rest of the paper proceeds as follows. Section 2 presents an examination of optimal UI when individuals may substitute to or from DI. Section 3 then presents the general model, describes analytical results, and briefly summarizes literatures of particular importance for future research, and Section 4 concludes.

## 2. Simple model of unemployment with disability

The study by Benitez-Silva et al. (2004) indicates that significant numbers of people who are physically capable of work apply for, and in many cases are granted, DI benefits. In the presence of such imperfect

<sup>4</sup> Optimal UI studies such as Hansen and Imrohoroglu (1992) and Chetty (2008) assume that the government uses a small payroll tax to pay for UI benefits, abstracting from all other activities of government, and a similar simplifying assumption is made in many studies of the welfare implications of DI and Social Security (for example, Golosov and Tsyvinski (2006) and Feldstein (1985)). Lawson (2013) points out that this abstraction ignores the important role of fiscal externalities generated by the impact of a particular program on the tax base, but he does not consider interactions with other programs.

<sup>5</sup> Hendren (2013) makes a similar point, arguing that a welfare analysis of a policy change that affects consumption of subsidized goods and services must incorporate the latter into the calculations. Hendren argues that increasing the generosity of the EITC may reduce takeup of other social programs, and incorporates estimated savings on other government expenditures into an analysis of job training and housing vouchers.

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