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Heterogeneity, adverse selection and valuation with endogenous labor supply ☆

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Abstract

This paper considers models of intratemporal consumption–labor choice and intertemporal consumption choice under heterogeneity and private information in preferences towards labor. We show that market regime regarding unemployment insurance is important to determine the effects of heterogeneity and private information on allocations and valuations. There are two main results. First, intertemporal choice can mitigate adverse selection. Second, in countries where unemployment insurance is generous capital markets should have low usage and the risk-free rate of return is low. However, in countries where unemployment insurance is less generous, capital markets should have more usage and the risk-free rate of return is higher.

JEL classification: D1; G1; J2; J3
Keywords: Private information; Adverse selection; Lottery; Unemployment insurance; Incomplete markets

1. Introduction

In this paper, we consider a dynamic two-period model with endogenous labor supply and potential for adverse selection based on private information of individual preferences. We use the model to draw conclusions about consumption and labor valuation and capital market activity.

Single period models of market activity with heterogeneity in preferences regarding labor supply show that under private information an important issue of adverse selection arises: Individuals have an incentive to misrepresent, e.g. Prescott and Townsend (1984), Townsend (1987) and more recently Bianconi (2001). We introduce intertemporal choice adding a dimension of consumption smoothing to the intratemporal problem of consumption–work choice. We show that the introduction of intertemporal choice can have important effects on efficient allocations and valuations. In our basic framework, there are several units, regions, or countries and potential differences within and across units.

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Individuals may use capital markets for consumption smoothing and there are potential differences in the preference for labor supply. We allow trade in lotteries as a revelation mechanism to avoid adverse selection, and consider allocations with tradable labor income.[1] We present two main results. First, the introduction of intertemporal choice can mitigate and/or eliminate adverse selection under private information. Second, the valuation of consumption and labor and the use of capital markets can vary substantially across different degrees of heterogeneity and different regimes of unemployment insurance.

This paper is a dynamic extension of Bianconi (2001), who finds that unemployment insurance regimes matter for asset allocation in a static framework. In the dynamic case, unemployment insurance matters along with the consumption smoothing problem. Individuals start with neither borrowing nor lending but use their ability to borrow/lend to smooth consumption. In the static case under private information, trade in lotteries (contracts) for employment can mitigate adverse selection providing a classic separating mechanism. In the dynamic case, we show that the introduction of trade in another good at another date (intertemporal choice) can alone mitigate the uneven distribution of consumption and work, which leads to adverse selection under private information. We further examine trade in lotteries (contracts) for employment in the dynamic case when the parameter space allows adverse selection to occur.

In our models, the regime regarding unemployment insurance plays an important role in determining efficient allocations and valuations.[2] The main result is that a regime of full unemployment insurance implies that individuals use capital markets only moderately. However, without unemployment insurance capital markets are used more heavily because individuals who eventually do not work must save to make up for the loss in future output. An earlier paper by Diamond and Mirrlees (1978) discusses the desirability of private saving in the presence of social insurance mechanisms. Here we find that, for sufficiently high elasticity of intertemporal substitution (high demand for consumption smoothing), private saving due to lack of full unemployment insurance (incomplete markets) is welfare improving over full unemployment insurance. However, for other parameter configurations this may not be the case. While authors such as Mulligan (2001) find negligible quantitative aggregate implications of indivisibilities in labor supply, we show that intertemporal trade and private information together with alternative regimes for unemployment insurance can have rather significant effects on allocations and valuations across units, regions or countries.

In particular, we first show that a necessary and sufficient condition for an uneven distribution of consumption and work across units to occur, under full information, is that the type with higher elasticity of intratemporal substitution between consumption and work (or less risk averse in labor supply) must be a borrower in the first period. This provides an appropriate parameter space for the study of economies with private information where adverse selection occurs. Then, we examine schemes of trade in lotteries (contracts) for employment under alternative unemployment insurance arrangements. Our analysis clearly shows that in countries where unemployment insurance is generous, capital markets have low use and the risk-free rate of return is low. However, in countries where unemployment insurance is less generous, capital markets have more usage and the risk-free rate of return is higher. This is an important hypothesis that requires further empirical testing.

The paper is organized as follows. Section 2 considers the basic structure while Section 3 gives the preliminaries on efficient allocations under full information with homogeneous types. Section 4 examines the alternative models with asymmetric information and alternative markets structures regarding unemployment insurance. Section 5 examines the numerical simulation of the alternative economies, and Section 6 examines the relationship between the allocations and the model equilibrium. Section 6 concludes.

[1] Prescott and Townsend (1984) and Townsend (1987) present the revelation mechanism used in this paper. Bianconi (2001) is a recent application. Another recent related model is Mulligan (2001) for the case of indivisibilities in labor supply, not adverse selection under private information. Other recent related papers are Gomes, Greenwood, and Rebelo (2001) and Alvarez and Veracierto (1999). The paper by Chan and Viceira (2000) presents a model where labor income is not tradable, and Bodie, Merton, and Samuelson (1992) is an early attempt to study the potential effects of labor choice on asset allocation.

[2] The notion of unemployment insurance discussed in this paper refers to the case where the lottery for employment comes with a clause of either full consumption regardless the outcome of the lottery, or no consumption if the outcome is unemployment. Thus in this paper, we examine the polar cases of either 100% replacement (full unemployment insurance) or no replacement (no unemployment insurance), e.g. Martin (1996). Other notions of unemployment insurance consider that a productivity shock occurs with some probability that the individual may loose her employment and so wishes to purchase unemployment insurance against that "bad" outcome. The papers by Gomes et al. (2001) and Alvarez and Veracierto (1999) consider this problem of unemployment insurance with alternative replacement ratios. This paper does not consider the productivity shock channel; but instead the heterogeneity in individual preferences channel.