Incomplete unemployment insurance and aggregate fluctuations ☆

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Abstract

This paper develops a real business cycle model characterized by idiosyncratic employment shocks and quantitatively explores the behavior of aggregate variables under the assumptions of complete and incomplete insurance markets. The results show that the model with incomplete markets produces standard deviations and correlations of aggregate labor input and labor productivity close to the ones of the US economy for the post-war period.
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1. Introduction

In this paper I conduct a quantitative exploration of the implications of idiosyncratic shocks and incomplete markets in an otherwise standard real business cycle (RBC) model. In particular, I compare the predictions with respect to time series properties of the average productivity of labor and market hours of two model economies that differ only in their insurance technologies. The empirical observations from the US economy during the post-war period show that:

 (i) fluctuations in market hours are only slightly smaller than fluctuations in output;
 (ii) hours worked fluctuates more than labor productivity;
(iii) hours per worker fluctuates less than the employment rate; and

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(iv) the correlation between average productivity and market hours is close to zero or even negative (the so-called Dunlop–Tarshis observation made by Sargent (1987) and Christiano and Eichenbaum (1992)).[1]

The usual approach in the literature to explain these facts has been to model competitive economies where a continuum of agents live forever. In those economies, the basic impulses generating business cycles fluctuations come from a stochastic shock to technology and, in many studies, from additional sources of aggregate uncertainty such as shocks to government spending and tax rates. Furthermore, either because agents are identical beforehand or because of the existence of a complete set of insurance markets, in most model economies an aggregation theorem holds that permits the study of the economic system "as if" it was inhabited by a single representative consumer.[2] One way to depart from the previous framework is to consider imperfectly competitive economies, as in, for instance, Galí (1996). Another alternative is to consider economies with incomplete insurance markets and idiosyncratic uncertainty.[3] This latter approach is the one I follow here.

The model I develop below is related to that in Imrohoroglu (1989) and other aggregate models of incomplete markets such as Aiyagari (1994), Huggett (1997), and Krusell and Smith (1998). In these models agents live forever, individual labor productivity endowments follow an exogenously given stochastic process and labor supply is inelastic, i.e., productive agents work a fixed number of hours. I depart from this setup in that productivity endowments are interpreted as unemployment shocks and in that employed agents are allowed to choose their labor supply. Thus, while in previous models both the extensive and intensive margins are exogenously determined, in this paper the intensive margin is endogenous.[4] In line with the related literature, in the incomplete markets economy the existence of unemployment insurance markets is exogenously precluded. Also, I assume that agents are able to smooth consumption by holding differing amounts of the single asset in the economy. Following the RBC tradition, this asset is risky because it is used as an input in production, which is subject to technology shocks. In the model,

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[1] See Hansen and Wright (1992) and Kydland (1995) for a survey of the US data.

[2] See Christiano and Eichenbaum (1992) and Braun (1994) among others. After Kydland and Prescott (1982) and Long and Plosser (1983), researchers have tried to explain fluctuations in the labor market by introducing indivisibilities, search, adjustment of labor supply in the intensive and extensive margins, durable goods, home production, and nominal rigidities. Examples in this literature include Hansen (1985), Benhabib et al. (1991), Hansen and Sargent (1988), Kydland and Prescott (1991), Cho and Cooley (1992; 1994), Baxter (1992), and Merz (1995). In all these studies the existence of complete markets is assumed, thus in equilibrium there is only aggregate uncertainty.

[3] The interest of this approach goes back to Prescott (1986, p. 21) when he asked "..., how would the behavior of the (...) economy change if agents did not have access to a technology to insure against random unemployment and instead had to self-insure against unemployment by holding liquid assets?"

[4] In fact, Krusell and Smith (1998) also compute the competitive equilibrium of an incomplete-markets economy with endogenous hours. However, they did not attempt to systematically explain the behavior of hours worked but merely checked whether having an endogenous labor supply altered their computational accuracy findings (for example, they considered a process where aggregate productivity and the employment rate could only take on two values).