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The wealth distribution in Bewley economies with capital income risk ☆

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Abstract

We study the wealth distribution in Bewley economies with idiosyncratic capital income risk. We show analytically that under rather general conditions on the stochastic structure of the economy, a unique ergodic distribution of wealth displays a fat tail.

JEL classification: E13; E21; E24

Keywords: Wealth distribution; Bewley economies; Pareto distribution; Fat tails; Capital income risk

1. Introduction

Bewley economies, as e.g., in Bewley (1977, 1983) and Aiyagari (1994),[1] represent one of the fundamental workhorses of modern macroeconomics, its main tool when moving away from the

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[1] The *Bewley economy* terminology is rather generally adopted and has been introduced by Ljungqvist and Sargent (2004).

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study of efficient economies with a representative agent to allow e.g., for incomplete markets.[2] In these economies each agent faces a stochastic process for labor earnings and solves an infinite horizon consumption-saving problem with incomplete markets. Typically, agents are restricted to save by investing in a risk-free bond and face a borrowing limit. The postulated process for labor earnings determines the dynamics of the equilibrium distributions for consumption, savings, and wealth.[3]

Models of Bewley economies have been successful in the study of several macroeconomic phenomena of interest. Calibrated versions of this class of models have been used to study welfare costs of inflation (Imrohoroglu, 1992), asset pricing (Mankiw, 1986; Huggett, 1993), unemployment benefits (Hansen and Imrohoroglu, 1992), fiscal policy (Aiyagari, 1995; Heathcote, 2005), and partial consumption insurance (Heathcote et al. 2008a, 2008b; Storesletten et al., 2001; Krueger and Perri, 2003).[4]

On the other hand, standard and plausible parametrizations of Bewley economies are hardly able to reproduce the observed distribution of wealth in many countries; see e.g., Aiyagari (1994) and Huggett (1993). More specifically, they cannot reproduce the high inequality and the fat right tail that empirical distributions of wealth tend to display.[5] This is because at high wealth levels, the incentives for precautionary savings taper off and the right tail of the wealth distribution remains thin; see Carroll (1997) and Quadrini (2000) for a discussion of these issues.[6]

In the present paper we analytically study the wealth distribution in the context of Bewley economies extended to allow for idiosyncratic capital income risk.[7] To this end we provide first an analysis of the standard *Income Fluctuation problem*, as e.g., in

[2] The assumption of complete markets is generally rejected in the data; see e.g., Attanasio and Davis (1996), Fisher and Johnson (2006) and Jappelli and Pistaferri (2006).

[3] More recent specifications of the model allow for aggregate risks and an equilibrium determination of labor earnings and interest rates; see Huggett (1993), Aiyagari (1994), Rios-Rull (1995), Krusell and Smith (1998, 2006); see also Ljungqvist and Sargent (2004), Ch. 17, for a review of results.

[4] See Heathcote et al. (2008b) for a recent survey of the quantitative implications of Bewley models.

[5] Large top wealth shares in the U.S. since the 60's are documented e.g., by Wolff (1987, 2004) and, more recently, by Kopczuk et al. (2014) using estate tax return data; Piketty and Zucman (2014) find large and increasing wealth-to-income ratios in the U.S. and Europe in 1970–2010 national balance sheets data. Fat tails for the distributions of wealth are also well documented, for example by Nirei and Souma (2004) for the U.S. and Japan from 1960 to 1999, by Clementi and Gallegati (2005) for Italy from 1977 to 2002, and by Dagsvik and Vatne (1999) for Norway in 1998. Restricting to the Forbes 400 richest U.S. individuals during 1988–2003, Klass et al. (2007) also find that the top end of the wealth distribution obeys a Pareto law.

[6] Stochastic labor earnings can in principle generate some skewness in the distribution of wealth, especially if the earnings process is itself skewed and persistent. Extensive evidence for the skewedness of the income distribution has been put forth in a series of papers by Emmanuel Saez and Thomas Piketty (some with co-authors), starting with Piketty and Saez (2003) on the U.S. We refer to Atkinson et al. (2011) for a survey and to the excellent website of the database they have collected (with Facundo Alvaredo), The World Top Incomes Database. However, most empirical studies of labor earnings find some form of stationarity of the earnings process; see Guvenen (2007) and e.g., the discussion of Primiceri and van Rens (2009) by Heathcote (2009). Persistent income shocks are often postulated to explain the cross-sectional distribution of consumption but seem hardly enough to produce fat tailed distributions of wealth; see e.g., Storesletten et al. (2004); see also Cagetti and De Nardi (2008) for a survey.

[7] Capital income risk has been introduced by Angeletos and Calvet (2005) and Angeletos (2007) and further studied by Panousi (2008) and by ourselves (Benhabib et al. 2011, 2013). Quadrini (1999, 2000) and Cagetti and De Nardi (2006) study entrepreneurial risk, one of the leading examples of capital income risk, explicitly. Jones and Kim (2014) study entrepreneurs in a growth context under risk introduced by creative destruction. Relatedly, Krusell and Smith (1998) introduce heterogeneous discount rates to numerically produce some skewness in the distribution of wealth. We refer to these papers and our previous papers, as well as to Benhabib and Bisin (2006) and Benhabib and Zhu (2008), for more general evidence on the macroeconomic relevance of capital income risk.