1 however, the agent's impatience and the absence of uncertainty would imply that he depletes any initial asset holdings and eventually ends up stuck at the borrowing constraint.[20]

Exchange Equilibrium A literature originating with Bewley (1977) studies economies where agents engage in precautionary saving because they are subject to two basic frictions: First, agents face some idiosyncratic income risk but markets are incomplete so that the agents cannot insure against negative income shocks. Second, agents cannot borrow freely but are subject to some exogenous borrowing constraint. This implies that the individual agent is solving a problem as in the previous section and has a precautionary motive to hold assets.

Using the techniques of dynamic programming, an optimal asset demand function can be derived that depends on the agent's current asset holdings a_t in addition to the characteristics of the endowment shocks e_t and the borrowing limit b. We will focus on the mean asset holdings $E[a]$ resulting from an individual agent's optimization. As discussed in the previous section, the key feature of $E[a]$ is that it diverges to infinity as the interest rate r approaches the agent's discount rate $\rho = \beta^{-1} - 1$ from below and therefore $E[a]$ can only be finite in an equilibrium with $r < \rho$.

If we assume that there is a continuum of agents with i.i.d. endowment shocks and no aggregate risk, the per-capita asset holdings of the economy is the same as the mean asset holdings of an individual agent so $E[a]$ represents the demand for assets or the supply of savings in the economy. Combining this aggregate asset supply from individual optimization with different specifications of aggregate asset demand yields a range of interesting implications.

In an exchange-economy setting, Huggett (1993) assumes that agents can only borrow and save amongst each other on a credit market so the aggregate net supply of assets is zero. This implies that in the steady state the equilibrium interest rate r is given by the market clearing condition $E[a] = 0$. The equilibrium interest rate is increasing if the borrowing limit b is increased but due to the features of $E[a]$, the equilibrium interest rate always satisfies $r < \rho$.[21]

Bewley (1980, 1983) studies the role of a government providing fiat money which

[20] For an excellent textbook discussion of this and some of the following materila see Ljungqvist and Sargent (2004).

[21] See Levine and Zame (2002) for an analysis of the impact of borrowing constraints in an exchange economy with convex marginal utility.