

The House-Hunting Problem Without Second Moments

Thomas Ferguson, UCLA
Michael Klass, UC Berkeley

Abstract. The house-hunting problem, also called the problem of selling an asset or the job search problem, involves i.i.d. variables, X_1, \dots, X_n, \dots which are observed sequentially at a cost of $c > 0$ per observation. The problem is to choose a stopping rule, N , to maximize $E(X_N - Nc)$. If the X 's have a finite second moment, the optimal stopping rule is $N^* = \min\{n \geq 1 : X_n > v^*\}$, where v^* satisfies $E(X - v^*)^+ = c$. The statement of the problem and its solution requires only the first moment of the X_n to be finite. Is a finite second moment really needed? In 1970, Herbert Robbins showed, assuming only a finite first moment, that the rule N^* is optimal within the class of stopping rules, N , such that $E(X_N - Nc)^- > -\infty$, but it is not clear that this restriction of the class of stopping rules is really required. In this paper we discuss the extent to which this restriction is needed.