1 Nash Equilibrium Strategy Profile

Theorem 1.1 (LCP Nash Equilibrium)**.** *LCP has a unique Nash equilibrium strategy profile in which the bettor's strategy is monotone-admissible (up to measure zero sets of hands for each player). This strategy profile is given by:*

$$
\begin{aligned}
x_0 &= \frac{3t^2\,(t-1)}{r^3+t^3-7} \\
x_1 &= \frac{-2r^3+3r^2+t^3-1}{r^3+t^3-7} \\
x_2 &= \frac{r^3+t^3-1}{r^3+t^3-7} \\
x_3 &= \frac{r^3-3r+t^3-4}{r^3+t^3-7} \\
x_4 &= \frac{r^3+3r^2-6r+t^3-4}{r^3+t^3-7} \\
x_5 &= \frac{r^3+t^3+3t^2-7}{r^3+t^3-7} \\
b_0 &= \frac{t^3}{r^3+t^3-7} \\
b(s) &= \frac{t^3\,(s+1)^3-(3s+1)}{(r^3+t^3-7)\,(s+1)^3} \\
c(s) &= \frac{r^3+t^3-1+s\,(r^3+t^3-7)}{(s+1)\,(r^3+t^3-7)} \\
v(s) &= \frac{r^3+t^3-1+(r^3+t^3-7)\,(2s^2+4s+1)}{2\,(r^3+t^3-7)\,(s^2+2s+1)}
\end{aligned}
$$

where $r = L/(1+L)$ *and* $t = 1/(1+U)$.

Remark: *The change of variables to* (r,t) *significantly simplifies the expressions compared to the original* (L,U) *formulation. This transformation reveals underlying symmetries and makes many properties more transparent, as we will see in the analysis of game value and parameter effects.*

Refer back to section **??** for an explanation of how these values fit together to actually form the strategy profile.

A proof of this theorem can be found in appendix **??**.

This solution is more interpretable in graphical form. Figure 1 shows the strategy profile for various values of L and U ranging from very lenient ($L = 0, U = 10$) to very restricted ($L = 0.5, U = 1$). The more lenient bet size limits

model something closer to NLCP, while the more restricted bet size limits model something closer FBCP with a fixed bet size. Indeed, we see that the strategy profile of for $L = 0, U = 10$ looks qualitatively similar to the strategy profile of NLCP - we will show in section **??** that the strategy profile approaches the Nash equilibrium of NLCP as L and U approach 0 and ∞, respectively, and that the strategy profile approaches the Nash equilibrium of FBCP as L and U approach some fixed value s from either side.

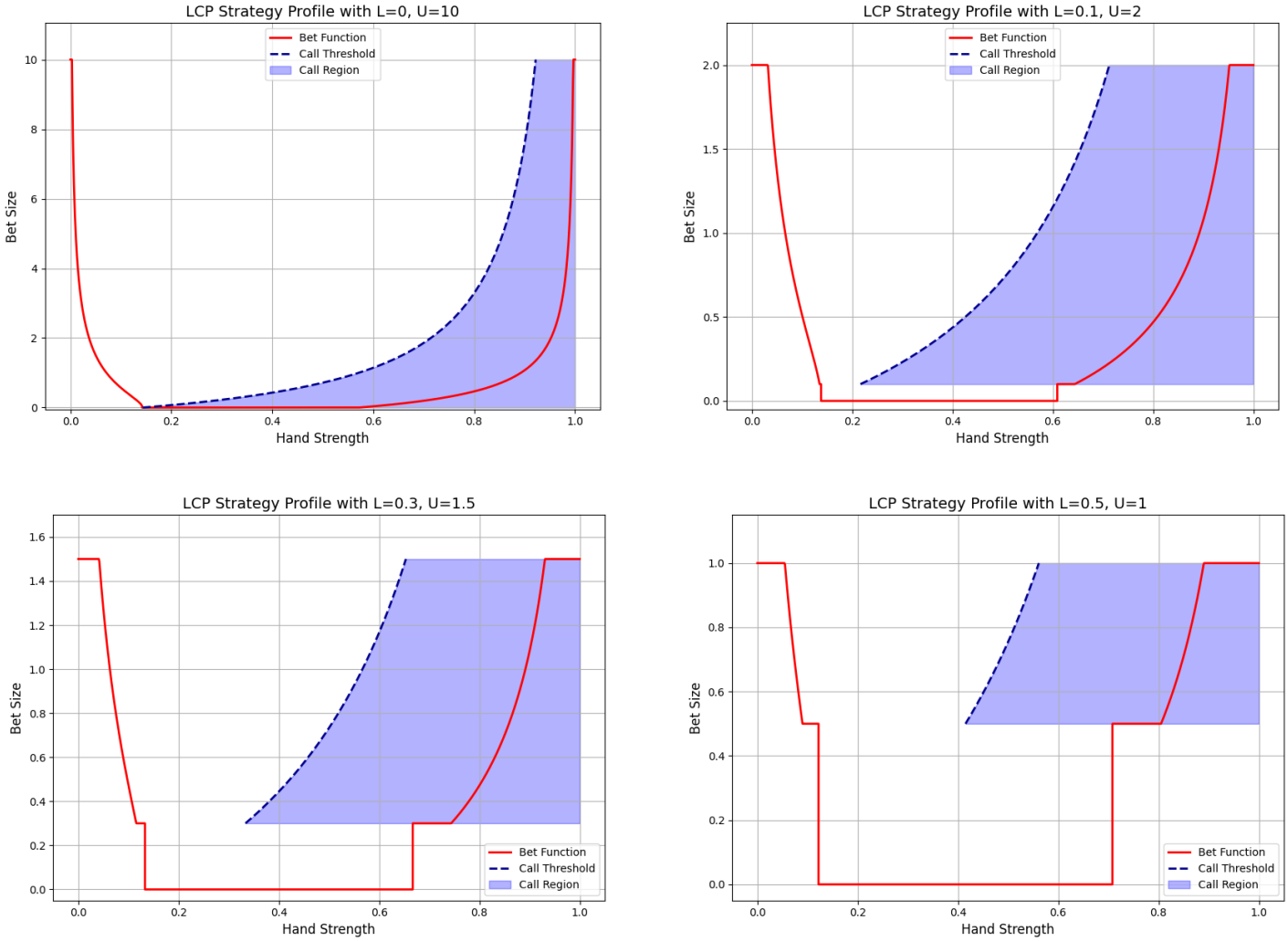

Figure 1: Nash equilibrium strategy profiles for different values of L and U, from very lenient to very restricted bet sizes. The bet function maps hand strengths to bet sizes, while the call function gives the minimum calling hand strength for a given bet size. The shaded regions represent the hand strengths for which the caller should call a given bet size.