There is a union and firm (denoted u and f)

the payoff function I have reached:

$$F^{-1}\left(\frac{1}{2}F\left(\frac{f+u}{2}\right)\right) \cdot F\left(\frac{f+u}{2}\right) + F^{-1}\left[\frac{1}{2}\left(1+F\left(\frac{f+u}{2}\right)\right)\right] \cdot \left[1-F\left(\frac{f+u}{2}\right)\right]$$

where F(x) = CDF of a symmetric distribution (for example – logistic distribution)
$F^{-1}(x)$ is the inverse function of F(x).

f 's objective is to minize the goal function.
u's objective is to maxize the goal function.

I have a feeling Sion's minimax theorem can be of help but I don't have the relevant
background to prove equilibrium…

Please help