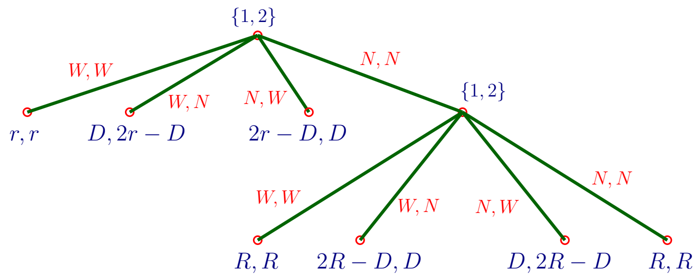
A Bank Deposit Game

This game tries to capture the possibility of bank runs. There are two players/depositors with total deposits $2D$ (D each). There are two stages, both players play in each and they can withdraw, action W or not withdraw, action N. Total yield is $2R$ if there is no withdrawal in stage 1, otherwise $2r$ with $r < D < R$. The other payoffs are as specified in the following game:

Figure 1: A Deposit Game



If they both withdraw at the first stage they get $r < D$ each. If neither does and they perform the same action in stage 2 they get $R > D$ each. In the first stage the single player who withdraws takes $D > r$, the other the remaining yield $2r - D < r$; in the second stage it is the opposite: the single one who leaves the money in the bank gets D, the other gets $2R - D > R$ (for the proceeds can be collected then).

We look for subgame perfect equilibria, so start at history N, N. There we have the following simultaneous move subgame, with unique equilibrium W, W.

	W	N
W	R, R	$2R - D$, D
N	D, $2R - D$	R, R

Therefore we can replace the above subgame with the resulting equilibrium payoff R, R, and get the following game at stage 1:

	W	N
W	r, r	D, $2r - D$
N	$2r - D$, D	R, R

This game has *two* Nash equilibria, W, W and N, N. Therefore the two-stage game has two subgame perfect equilibria: one is the profile (WW, WW), where both players play WW that is withdraw at each stage, the other is (NW, NW) where both only withdraw at the second stage. The second yields R each which is higher than the payoff r they get in the first equilibrium. The latter models a "bank run" - it is inefficient but it is still an equilibrium.