$$P(n_1, n) = \frac{\binom{n_1 - 1 + b/c}{n_1}\binom{n_2 - 1 + r/c}{n_2}}{\binom{n - 1 + (b+r)/c}{n}} = \frac{\binom{-b/c}{n_1}\binom{-r/c}{n_2}}{\binom{-(b+r)/c}{n}}$$