Winning odds in Eurojackpot

All possible combinations

There are 5 numbers picked out of 1..50 range without repetition and additional 2 numbers out in a range of 1..10.

Formula of all combinations without repetition:

$$C_{n,k} = \binom{n}{k} = \frac{n!}{k!(n-k)!}$$

First, picking 5 right numbers gives us 50!/(5!(50-5)!) = 2118760 (1:2118760)

Adding two more numbers, 10!/(2!(10-2)!) = 45

Winning the lottery (5+2) happens once in 2118760*45 = 95344200 attempts

To win jackpot we can use any numbers since they are all equally probable. However, there are patterns to increase the ways to win.

Odd-even patterns

If we break down all possible combinations to odd and even numbers we can see less pairs with all odd or all even number over 3-2 odd-even: all even - 53130 winning vs 2065630 losing cases while 3-2 odd-even gives us 690000 winning to 1428760 losing cases.

That means players are better off using 3-2, 2-3 patterns.

Low-high patterns

Low numbers - n[1..25], high - n[26..50]

2012-2020 draws show differences in frequency of 0-5 low-high to 3-2 low-high (~0.02 and ~0.32 correspondently). That means there is greater number of ways to win if picking 3-2 low-high numbers.