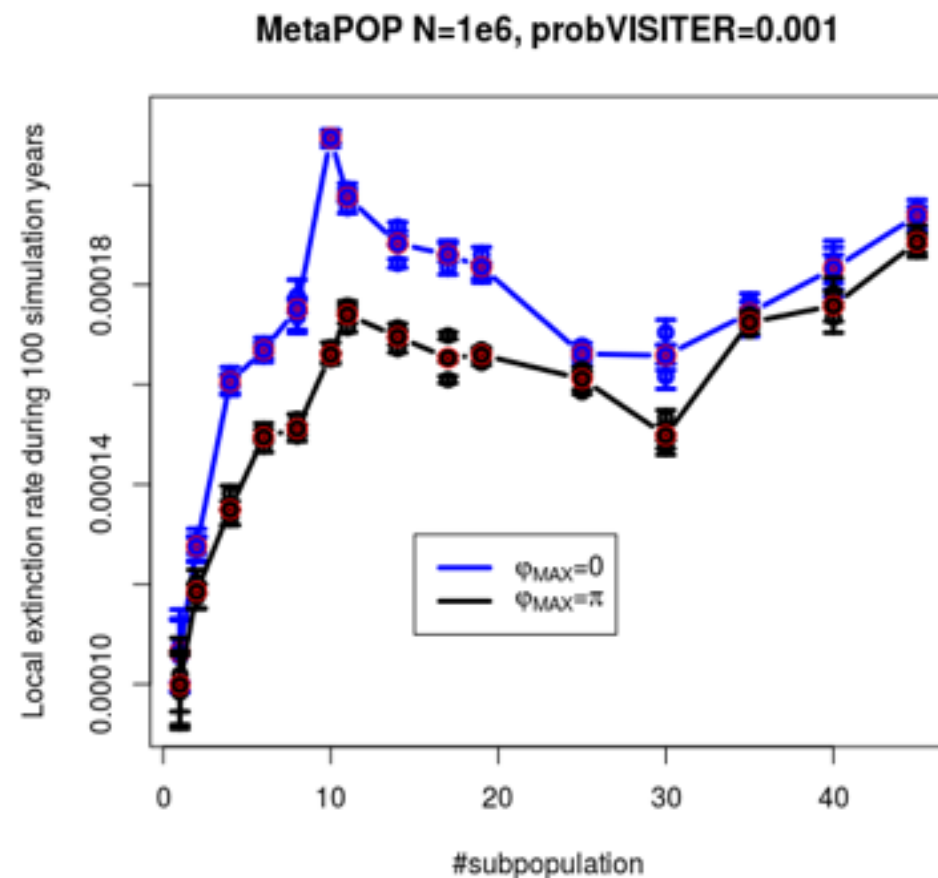Assumptions:
- no environmental forcing
- total population of constant size
- sub-populations of similar sizes
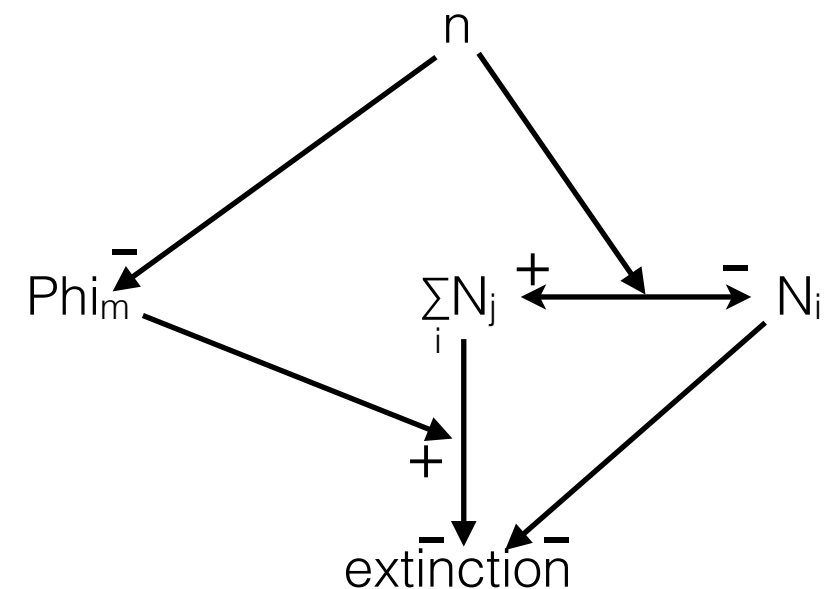
Goal: understanding the effect of fragmentation (n) on local extinction
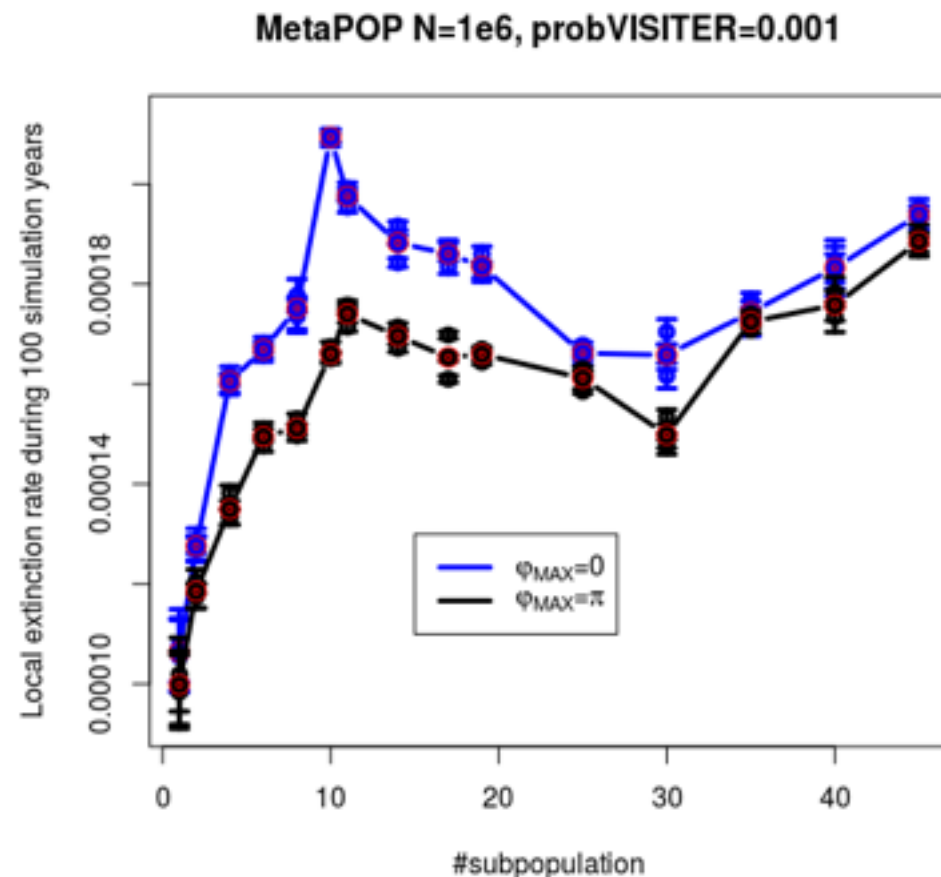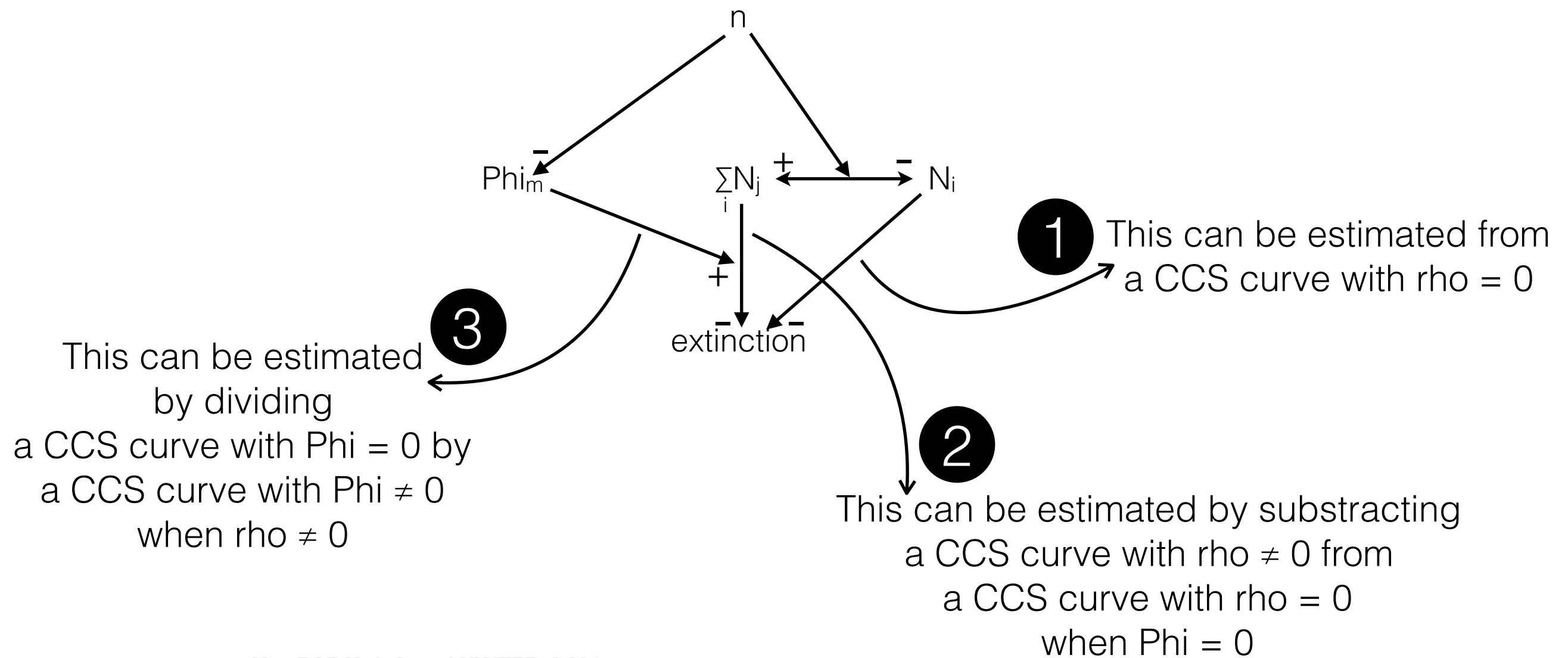
Method: playing with coupling rho and synchrony Phi

Simulation results:

Conceptual mechanism:

MetaPOP N=1e6, probVISITER=0.001

$\varphi_{MAX}=0$
$\varphi_{MAX}=\pi$

Local extinction rate during 100 simulation years

#subpopulation

n

Phi$_m$ $\sum_i N_j$ N_i

extinction

1 This can be estimated from a CCS curve with rho = 0

3 This can be estimated by dividing a CCS curve with Phi = 0 by a CCS curve with Phi ≠ 0 when rho ≠ 0

2 This can be estimated by substracting a CCS curve with rho ≠ 0 from a CCS curve with rho = 0 when Phi = 0

MetaPOP N=1e6, probVISITER=0.001

Local extinction rate during 100 simulation years

$\varphi_{MAX}=0$
$\varphi_{MAX}=\pi$

#subpopulation

Then, the blue curve should be equal to the sum of curves 1 & 2…

…and the red curve should be equal to the sum of curve 1 and the product of curves 2 and 3