$$
\begin{aligned}
P_s\left[\frac{i_o}{n_o}\middle|\frac{i_c}{n_c}\right] = &+ \left(\frac{1-(n_c-1)}{N}\right)\frac{n_c-i_c}{n_c}P_s\left[\frac{i_o}{n_o-1}\middle|\frac{i_c}{n_c-1}\right]\\
&+ \left(\frac{1-(n_c-1)}{N}\right)\frac{i_c}{n_c}(1-s)P_s\left[\frac{i_o-1}{n_o-1}\middle|\frac{i_c-1}{n_c-1}\right]\\
&+ \frac{n_c-i_c}{N}P_s\left[\frac{i_o}{n_o-1}\middle|\frac{i_c}{n_c}\right]\\
&+ \frac{i_c}{N}(1-s)P_s\left[\frac{i_o-1}{n_o-1}\middle|\frac{i_c}{n_c}\right]\\
&+ \left(1-\frac{n_c-2}{N}\right)\frac{i_c}{n_c}s\left(1-\frac{n_c-1}{N}\right)\frac{n_c-i_c}{n_c-1}P_s\left[\frac{i_o}{n_o-1}\middle|\frac{i_c-1}{n_c-2}\right]\\
&+ \left(1-\frac{n_c-2}{N}\right)\frac{i_c}{n_c}s\left(1-\frac{n_c-1}{N}\right)\frac{i_c-1}{n_c-1}P_s\left[\frac{i_o-1}{n_o-1}\middle|\frac{i_c-2}{n_c-2}\right]\\
&+ \frac{i_c}{N}s\frac{n_c-i_c}{N}P_s\left[\frac{i_o}{n_o-1}\middle|\frac{i_c}{n_c}\right]\\
&+ \frac{i_c}{N}s\frac{i_c-1}{N}P_s\left[\frac{i_o-1}{n_o-1}\middle|\frac{i_c}{n_c}\right]\\
&+ \frac{i_c}{N}s\left(1-\frac{n_c-1}{N}\right)\frac{n_o-i_o}{n_o}P_s\left[\frac{i_o}{n_o-1}\middle|\frac{i_c}{n_c-1}\right]\\
&+ \frac{i_c}{N}s\left(1-\frac{n_c-1}{N}\right)\frac{i_o}{N}P_s\left[\frac{i_o-1}{n_o-1}\middle|\frac{i_c-1}{n_c-1}\right]\\
&+ \left(1-\frac{n_c-1}{N}\right)\frac{i_c}{n_c}s\left(\frac{n_c-i_c}{N}\right)P_s\left[\frac{i_o}{n_o-1}\middle|\frac{i_c-1}{n_c-1}\right]\\
&+ \left(1-\frac{n_c-1}{N}\right)\frac{i_c}{n_c}s\frac{i_c-1}{N}P_s\left[\frac{i_o-1}{n_o-1}\middle|\frac{i_c-1}{n_c-1}\right]
\end{aligned}
$$