**Table S2**. All the expectations of $E(x)$, $E(b)$, and $E(c)$ when $(G_F,\ G_M,\ G_O) \in \Omega_{\mathbf{II}}$.

| $G_O$ | $x$ | $P\{G_M, G_F \mid G_O\}$ | b | c | $E(b \mid G_O)$ | $E(c \mid G_O)$ | $E(x \mid G_O)$ |
|---|---|---|---|---|---|---|---|
| $G_O = 0$ | $x = -2$ | $P\{G_F = 1,\ G_M = 1 \mid G_O\} = \mathrm{MAF}^2$ | 0 | 2 | 0 | 2MAF | $-2\,\mathrm{MAF}$ |
| | $x = -1$ | $P\{G_F = 0,\ G_M = 1 \mid G_O\} = 2\mathrm{MAF}\cdot(1-\mathrm{MAF})$ | 0 | 1 | | | |
| | $x = 0$ | $P\{G_F = 0,\ G_M = 0 \mid G_O\} = (1-\mathrm{MAF})^2$ | - | - | | | |
| $G_O = 1$ | $x = -1$ | $P\{G_F = 1,\ G_M = 2 \mid G_O\} = \mathrm{MAF}^2$ | 0 | 1 | $1-\mathrm{MAF}$ | MAF | $1-2\,\mathrm{MAF}$ |
| | $x = 0$ | $(G_F = 1,\ G_M = 1) \mid G_O\} = \mathrm{MAF}\cdot(1-\mathrm{MAF})$ | 1 | 1 | | | |
| | | $P\{(G_F = 0,\ G_M = 2) = \mathrm{MAF}\cdot(1-\mathrm{MAF})$ | - | - | | | |
| | $x = 1$ | $P\{G_F = 0,\ G_M = 1 \mid G_O\} = (1-\mathrm{MAF})^2$ | 1 | 0 | | | |
| $G_O = 2$ | $x = 0$ | $P\{G_F = 2,\ G_M = 2 \mid G_O\} = \mathrm{MAF}^2$ | - | - | $2(1-\mathrm{MAF})$ | 0 | $2(1-\mathrm{MAF})$ |
| | $x = 1$ | $P\{G_F = 1,\ G_M = 2 \mid G_O\} = 2\mathrm{MAF}\cdot(1-\mathrm{MAF})$ | 1 | 0 | | | |
| | $x = 2$ | $P\{G_F = 1,\ G_M = 1 \mid G_O\} = (1-\mathrm{MAF})^2$ | 2 | 0 | | | |