The c.d.f. of w_B is denoted $F_B(z)$, and given by

$$\begin{aligned}
\Pr(w_B \leq z) &= \Pr\left(G \leq w_B^{-1}(z)\right) \\
&= \Phi\left(w_B^{-1}(z)\right) \\
&= \Phi\left(\frac{\Phi^{-1}(\alpha+h)+\sqrt{1-\beta'}\Phi^{-1}(z)}{\sqrt{\beta'}}\right) \qquad (24)
\end{aligned}$$

If the bank chooses the good portfolio, the default probability is α and correlation in defaults is zero. The c.d.f. of the good portfolio realisation is obtained from (24) by setting $h = 0$ and taking $\beta' \to 0$. In this limit, the numerator of the expression inside the brackets in (24) is positive when $z > 1 - \alpha$ and negative when $z < 1 - \alpha$. Thus, the realisation of the good portfolio has c.d.f. given by

$$F_G(z) = \begin{cases} 0 & \text{if } z < 1-\alpha \\ 1 & \text{if } z \geq 1-\alpha \end{cases} \qquad (25)$$

The good portfolio allows full diversification by the bank.

Denote by ψ the notional debt ratio of the global bank; that is, ψ is the default point of the global bank for one dollar face value of loans, and hence the strike price of the implicit option from limited liability. The incentive compatibility constraint for the global bank to choose the good portfolio is

$$E(w_G) - [\psi - \pi_G(\psi)] \geq E(w_B) - [\psi - \pi_B(\psi)] \qquad (26)$$

where $E(w_G)$ is the expected payoff of the good portfolio and $\pi_G(\psi)$ is the put option value with strike ψ under the good portfolio. $E(w_B)$ and $\pi_B(\psi)$ are defined analogously for the bad portfolio. Writing $\Delta\pi(\psi) = \pi_B(\psi) - \pi_G(\psi)$, (26) can be written as

$$\Delta\pi(\psi) \leq h \qquad (27)$$

Incentive compatibility entails keeping leverage low enough that the higher option value to default does not exceed the greater expected payoff of the good portfolio.

Lemma 2 *There is a unique ψ that solves $\Delta\pi(\psi) = h$, where $\psi < 1 - \alpha$.*