We now present a second solution to this distribution of inspection effort problem, a solution which applies when detection probabilities have different properties.

Theorem 3.2 (Spreading of inspection effort)
Let $1-\beta_1(\varepsilon_1)$ and $1-\beta_2(\varepsilon-\varepsilon_1)$ have properties (3.8) and (3.9) and let them be strictly concave, i.e.,

$$\frac{d^2}{d\varepsilon_1^2}(1-\beta_1(\varepsilon_1)) < 0, \; \frac{d^2}{d\varepsilon_1^2}(1-\beta_2(\varepsilon-\varepsilon_1)) < 0 \text{ for all } \varepsilon_1 \text{ with } 0 \le \varepsilon_1 \le \varepsilon. \quad (3.26)$$

Then the equilibria (F^*, q_1^*, q_2^*) and the equilibrium payoffs E_I^* and E_S^* of the game described above are given by

$$F^*(\varepsilon_1) = \begin{cases} 0 & \text{for } \varepsilon < \varepsilon_1^* \text{ with } 0 < \varepsilon_1^* < \varepsilon \\ 1 & \text{otherwise} \end{cases} \quad (3.27)$$

where

(i) If $\beta_1^{-1}\left(\frac{b_1}{b_1+d_1}\right) + \beta_2^{-1}\left(\frac{b_2}{b_2+d_2}\right) < \varepsilon$ (3.28)

where $\beta_i^{-1}(\cdot)$ is the inverse of $\beta_i(\cdot)$ for $i = 1, 2$, then

$$\beta_1^{-1}\left(\frac{b_1}{b_1+d_1}\right) \le \varepsilon_1^* \le \varepsilon - \beta_2^{-1}\left(\frac{b_2}{b_2+d_2}\right), \; q_1^* = q_2^* = 0 \quad (3.29)$$

$$E_I^* = E_S^* = 0. \quad (3.30)$$

(ii) If $\beta_1^{-1}\left(\frac{b_1}{b_1+d_1}\right) + \beta_2^{-1}\left(\frac{b_2}{b_2+d_2}\right) \ge \varepsilon$ and $d_1 > d_2$; (3.31)

If $b_1 + d_2 > (b_1 + d_1) \cdot \beta_1(\varepsilon)$, (3.32)

ε_1^* is the unique solution of the equation

$$-b_1 + (b_1 + d_1) \cdot \beta_1(\varepsilon_1^*) = -b_2 + (b_2 + d_2) \cdot \beta_2(\varepsilon - \varepsilon_1^*). \quad (3.33)$$

Furthermore,

$$q_1^* = \frac{G_2}{G_1 + G_2} = 1 - q_2^*, \quad (3.34)$$

the equilibrium payoffs are