# The Culture of Overconfidence
# Online Appendix

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## A Appendix

### A.1 When the leader is concerned about beliefs about her ability

In Holmström (1999) and much subsequent work on career concerns, the leader's reputational payoff is a linear function of her expected ability. We now show that this assumption yields a model formally equivalent to the one analyzed in the text of the paper, where the leader's payoff is linear in the observer's belief about project quality. The leader's ability is $\tau \in \{H, L\}$, and project quality is $\omega \in \{G, B\}$. Let $\lambda$ denote the prior probability that the leader is of type $H$. Let $p_\tau := \Pr(\omega = G|\tau)$ denote the probability with which type $\tau$ has a good project, with $p_H > p_L$. The common prior on project quality is $p := \lambda\, p_H + (1-\lambda)\, p_L$. Let $\beta$ be the observer's posterior belief, at date two, regarding project quality. Let $\nu(\beta)$ denote the observer's posterior belief at date two that the leader is of type $H$, given $\beta$. The relation between $\nu$ and $\beta$ is as follows. When the project succeeds, $\beta = 1$ and

$$\nu(1) = \frac{\lambda\, p_H}{\lambda\, p_H + (1-\lambda)\, p_L}.$$

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When the project fails, $\beta = 0$ and

$$\nu(0) = \frac{\lambda\,(1-p_H)}{\lambda\,(1-p_H) + (1-\lambda)\,(1-p_L)} < \nu(1).$$

Both $\nu$ and $\beta$ must satisfy the martingale property for a (hypothetical) experiment which perfectly reveals the project's quality, hence

$$\nu(\beta) = \beta\,\nu(1) + (1-\beta)\,\nu(0).$$

Let $\delta := \nu(1) - \nu(0) < 1$. Then,

$$\nu(\beta) = \nu(0) + \delta\beta.$$

Suppose that the observer takes an action in $[0,1]$ to match $\nu$, and the leader's total payoff equals $\tilde{\theta}V + \nu$, where $V$ denotes the social payoff from the project, and $\tilde{\theta} > 0$ is a constant parameter reflecting the intensity of the leader's social concerns. Thus the leader's payoff equals

$$\tilde{\theta}V + \nu(0) + \delta\beta.$$

If we let $\theta := \tilde{\theta}/\delta$, then the above payoff is identical to the one analyzed in the text, except for a constant term, $\nu(0)/\delta$, which accrues to both actions, stop and continue, and therefore does not affect the analysis.

## A.2 Proof of Lemma 1

The derivative of $\pi^{\dagger}(\mu)$ is

$$\frac{\gamma+1}{(\gamma\mu+1)^2} > 0. \tag{A.1}$$

The numerator in the above expression does not depend on $\mu$, and the denominator is increasing in $\mu$ when $\gamma > 0$. Thus the derivative of $\pi^{\dagger}$ is strictly decreasing in $\mu$. Since $\pi^{\dagger}$ is strictly concave in $\mu$, with $\pi^{\dagger}(0) = 0$ and $\pi^{\dagger}(1) = 1$, it follows that $\pi^{\dagger}(\mu) > \mu$ for every $\mu \in (0,1)$.

In the case of underconfidence, i.e. when $\gamma < 0$, $\pi^\dagger$ continues to be increasing, since $\gamma > -1$, but the denominator in A.1 is strictly decreasing, so that $\pi^\dagger$ is strictly convex, and $\pi^\dagger(\mu) < \mu$ for every $\mu \in (0,1)$.

# References

HOLMSTRÖM, B. (1999): "Managerial Incentive Problems: A Dynamic Perspective," *Review of Economic Studies*, 66(1), 169–182.