Executive Stock Options as a Screening Mechanism

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- Why?
- (Another interesting question we do not explore here is their price...).

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  - Oyer and Schaefer (2004) find empirical support in favor of sorting
- Darrough and Stoughton (1988) show that non-linear compensation schemes can provide a better self-selection mechanism than linear schemes

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  - We provide more structure and can analyze this argument in more detail

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  - δ can be interpreted as an indicator of the type (quality) of the executive

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- The intuition of our results seems robust to more general settings

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$$A(R) := \left\{(K,n) \in [0,\infty)^2 : \max_{a,\sigma} E\left[\log\left\{n(S_T - K)^+\right\} - \frac{1}{2}\int_0^T a_t^2 dt\right] \geq R\right\}$$

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$$\max_{(K,n)\in A(R)} h(K,n)$$

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  - finally, different types types have different reservation wages R_H, R_L, with $R_H > R_L$

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h_M(K_H, K_L, n_H, n_L) \quad := \quad & p_H \left(\lambda E^H[S_T] - n_H E^H[(S_T - K_H)^+]\right) \\
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  ii) Single contract, no exclusion,

$$h_S(K, n) \quad := \quad p_H \left(\lambda E^H[S_T] - n E^H[(S_T - K)^+] \right) + p_L \left(\lambda E^L[S_T] - n E^L[(S_T - K)^+] \right)$$

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h_S^* &= \max_{\{(K,n)\in A(R_H)\cap A(R_L)\}} h_S(K,n)\\
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  ii) Pooling equilibrium, when the optimal contract is a single pair (K^*, n^*) and $(K^*, n^*) \in A(R_H) \cap A(R_L)$

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  - And we can use standard martingale -or convex duality- techniques
- We derive analytic solutions for $\hat{a}$ and $\hat{\sigma}$

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- Expected effort is decreasing in α

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  - Higher quality executives can take more risk because they are more adept at fixing things through effort
- For short-term options, optimal risk and effort are (locally) negatively correlated