Online Appendix

A1. Proofs

In this section of the Appendix, we prove Propositions 1, 2 and 3 of the paper. Moreover, in subsection A1.b we define the optimal equity contract, as a necessary step to prove Propositions 2 and 3. Finally, in subsection A1.e we discuss the robustness of our theoretical results to different parametric assumptions.

a. Proof of Proposition 1

First, we consider the range of parameter values for which Proposition 1 states that $D^*_{\hat{\omega}} = I$, i.e., $\sigma \leq \Delta - B/\alpha$ for the rational CEO and $\sigma \leq \Delta - B/\alpha + \omega$ for the overconfident CEO, or, in other words, whenever $\sigma \leq \Delta - B/\alpha + \hat{\omega}_{\text{CEO}}$. We start by showing that the CEO's IC constraints are satisfied under $D^*_{\hat{\omega}}$ in both states of the world. In the good state, the CEO exerts high effort iff:

$$(\text{IC}_{\text{D,Good}}) \qquad \alpha \cdot \max\{0, I + \sigma + \Delta + \hat{\omega}_{CEO} - I\} \geq \alpha \cdot \max\{0, I + \sigma - I\} + B \qquad (A.1)$$

$$\Leftrightarrow \max\{0, \sigma + \Delta + \hat{\omega}_{CEO}\} \geq \max\{0, \sigma\} + B/\alpha$$

$$\Leftrightarrow \sigma + \Delta + \hat{\omega}_{CEO} \geq \sigma + B/\alpha$$

$$\Leftrightarrow \Delta + \hat{\omega}_{CEO} \geq B/\alpha$$

which is implied by our initial assumption $\Delta > B/\alpha$. In the bad state, the CEO exerts high effort iff:

$$(\text{IC}_{\text{D,Bad}}) \qquad \alpha \cdot \max\{0, I - \sigma + \Delta + \hat{\omega}_{CEO} - I\} \geq \alpha \cdot \max\{0, I - \sigma - I\} + B \qquad (A.2)$$

$$\Leftrightarrow \max\{0, -\sigma + \Delta + \hat{\omega}_{CEO}\} \geq \max\{0, -\sigma\} + B/\alpha$$

$$\Leftrightarrow -\sigma + \Delta + \hat{\omega}_{CEO} \geq B/\alpha$$

$$\Leftrightarrow \Delta - B/\alpha + \hat{\omega}_{CEO} \geq +\sigma$$

which is exactly the parameter range we are considering. Thus, the CEO will exert high effort in

both states of the world. Plugging $e_s = \text{High}$ into the participation constraint (4c), we obtain

$$\frac{1}{2}(\min\{I, I+\sigma+\Delta\} + \min\{I, I-\sigma+\Delta\}) = I. \tag{A.3}$$

That is, the participation constraint holds with equality for the case considered here (as $\sigma \leq \Delta - B/\alpha + \widehat{\omega}_{\text{CEO}} \wedge B/\alpha \geq \omega \Longrightarrow \sigma < \Delta$). Hence, under $D^*_{\widehat{\omega}} = I$, all of the net the surplus goes to existing shareholders. The expected utility of a rational CFO is $\beta\Delta$; the overconfident CFO expects to get $\beta(\Delta + \omega)$. The perceived firm value (under the CFO's beliefs) is also maximized under this contract for both types of CFOs, proving that this contract is indeed optimal.

To prove uniqueness, consider any other debt contract with face value $\widetilde{D}$. We can immediately rule out $\widetilde{D} < I$ as it does not satisfy the participation constraint. For $\widetilde{D} > I$, there are two cases to consider: either the CEO exerts effort in both states of the world, or she does not. If she does, debtholders will extract positive rents, and hence this type of contract cannot be optimal for the CFO. If she does not, the resulting welfare loss implies that the rents that the CFO can extract (under debtholders' break-even constraint) will not be maximized. Hence, $D^*_{\widehat{\omega}} = I$ is optimal when $\sigma \leq \Delta - B/\alpha + \widehat{\omega}_{\text{CEO}}$.

Second, we consider the range of parameter values for which Proposition 1 states that $D^*_{\widehat{\omega}} = I + \sigma$, i.e., $\sigma > \Delta - B/\alpha$ for the rational CEO and $\sigma > \Delta - B/\alpha + \omega$ for the overconfident CEO, or, in other words, whenever $\sigma > \Delta - B/\alpha + \widehat{\omega}_{\text{CEO}}$. We start by showing that the CEO exerts high effort in the good state and shirks in the bad state. In the good state, the CEO exerts high effort iff:

$$\begin{aligned} (\text{IC}_{\text{D,Good}}) \quad & \alpha \cdot \max\{0, I+\sigma+\Delta+\widehat{\omega}_{CEO}-I-\sigma\} \geq \alpha \cdot \max\{0, I+\sigma-I-\sigma\} + B \\ & \Leftrightarrow \max\{0, \Delta+\widehat{\omega}_{CEO}\} \geq \max\{0,0\} + B/\alpha \\ & \Leftrightarrow \Delta + \widehat{\omega}_{CEO} \geq B/\alpha \end{aligned} \tag{A.4}$$

which is implied by our initial assumption $\Delta > B/\alpha$. In the bad state, the CEO exerts low effort iff:

$$\begin{aligned} (\text{IC}_{\text{D,Bad}}) \quad & \alpha \cdot \max\{0, I-\sigma+\Delta+\widehat{\omega}_{CEO}-I-\sigma\} < \alpha \cdot \max\{0, I-\sigma-I-\sigma\} + B \\ & \Leftrightarrow \max\{0, -2\sigma+\Delta+\widehat{\omega}_{CEO}\} < \max\{0, -2\sigma\} + B/\alpha \\ & \Leftrightarrow \max\{0, -2\sigma+\Delta+\widehat{\omega}_{CEO}\} < B/\alpha \end{aligned} \tag{A.5}$$

This is immediately satisfied if $-2\sigma + \Delta + \hat{\omega}_{CEO} \leq 0$ (since $0 < B/\alpha$), and it is also satisfied if $-2\sigma + \Delta + \hat{\omega}_{CEO} > 0$ (since in the parameter range $\sigma > \Delta - B/\alpha + \hat{\omega}_{\text{CEO}}$ it must also hold that $2\sigma > \Delta - B/\alpha + \hat{\omega}_{CEO}$). Therefore, the CEO is going to exert high effort in the good state of the world and low effort in the bad state of the world. Plugging those effort levels into participation constraint (4c), we obtain that the participation constraint holds with equality:

$$\frac{1}{2}(\min\{I + \sigma, I + \sigma + \Delta\} + \min\{I + \sigma, I - \sigma\}) = I. \tag{A.6}$$

Again, debtholders receive I in expectation, and all of the net the surplus goes to existing shareholders. In this case, a rational CFO's expected utility is $\beta\Delta/2$, and an overconfident CFO expects to get $\beta(\Delta + \omega)/2$.

To see that this is the unique optimal contract, consider an alternative contract $\widetilde{D} \neq D^*_{\hat{\omega}}$. We can again rule out $\widetilde{D} < I$ since debtholders cannot break even. For $\widetilde{D} \geq I$, we first ask whether the CEO would exert high effort in both states of the world, only in the good state of the world, only in the bad state of the world or in neither state.

In the bad state of the world, the CEO exerts high effort under contract $\widetilde{D}$ iff:

$$\alpha\left[\max\left\{0, I - \sigma + \Delta + \hat{\omega}_{CEO} - \widetilde{D}\right\}\right] \geq \alpha\left[\max\left\{0, I - \sigma - \widetilde{D}\right\}\right] + B. \tag{A.7}$$

With $\widetilde{D} \geq I$, the IC becomes:

$$\alpha\left[\max\left\{0, I - \sigma + \Delta + \hat{\omega}_{CEO} - \widetilde{D}\right\}\right] \geq B, \tag{A.8}$$

which can hold only if $I - \widetilde{D} \geq \sigma - (\Delta + \hat{\omega}_{CEO} - B/\alpha)$. However, as we consider the parameter space where $\sigma - (\Delta + \hat{\omega} - B/\alpha) > 0$, this implies $I - \widetilde{D} > 0$, contradicting that $\widetilde{D} \geq I$.

Hence, the CEO will exert low effort in the bad state of the world. Because debtholders cannot obtain more than $I - \sigma$ in the bad state of the world, the optimal contract requires $\widetilde{D} \geq D^*_{\hat{\omega}} = I + \sigma$ in order for debtholders to break even. Because $\widetilde{D} \neq D^*_{\hat{\omega}}$, we must have $\widetilde{D} > D^*_{\hat{\omega}}$. We are left with two cases: Either the CEO exerts effort only in the good state of the world, or in neither state. In the former case, debtholders extract a strictly positive rent because of the higher face value $\widetilde{D} >$

$D^*_{\hat{\omega}}$, contradicting optimality from the perspective of the CFO. In the latter case, the contract with face value $D^*_{\hat{\omega}}$ generates higher total surplus for the CFO (under debtholders' participation constraint). More specifically, with any contract such that the CEO does not exert effort in either state of the world, a rational CFO will expect at most $\beta\Delta/2 < \beta\Delta$; the overconfident CFO will expect at most $\beta(\Delta+\omega)/2 < \beta(\Delta+\omega)$, again contradicting optimality.

Therefore, we have:

- $D^*_{\hat{\omega}} = I$ for both the rational and the overconfident CEOs if $\sigma \leq \Delta - B/\alpha$
- $D^*_{\hat{\omega}} = I + \sigma$ for both the rational and the overconfident CEOs if $\sigma > \Delta - B/\alpha + \omega$
- $D^*_{\hat{\omega}} = I$ for the overconfident CEO and $D^* = I + \sigma$ for the rational CEO if $\Delta - B/\alpha + \omega \geq \sigma > \Delta - B/\alpha$.■

b. The Cost of Equity

In order to predict the CFO's choice between debt and equity, we first derive the cost of equity under the optimal contract. As in the case of debt, we will see that the optimal equity contract is independent of the CFO's type.

We adopt the same notation as for the debt contract. Let $\hat{\pi}_{CFO}(S,e)$ be the return to the project under the CFO's beliefs. We denote the fraction of the firm owned by new shareholders by γ. The CFO solves the following program to determine the (second-best) optimal equity contract:

$$\max_{\gamma} \beta(1-\gamma)E[\hat{\pi}_{CFO}(S,e_s)] \tag{A.9a}$$

$$u_{CEO}(S,\gamma,e_s) \geq u_{CEO}(S,\gamma,e'_s)\ \forall S \text{ and } e_s \neq e'_s \tag{A.9b}$$

$$\gamma E[\pi(S,e_s)] \geq I. \tag{A.9c}$$

We first establish:

Lemma 1 (Cost of Equity). *The optimal equity contract is depends on the CEO's but not on of CFO's bias. In particular,* $\gamma^*_{\hat{\omega}} = \frac{I}{I+\Delta}$ *and* $e_s = \text{High}\ \forall S$ *if* $\frac{\Delta+\hat{\omega}_{CEO}}{I+\Delta}\Delta \geq \frac{B}{\alpha}$ *and* $\gamma^*_{\hat{\omega}} = 1$ *and* $e_s = \text{Low}\ \forall S$ *if* $\frac{\Delta+\hat{\omega}_{CEO}}{I+\Delta}\Delta < \frac{B}{\alpha}$.

Proof. From equation (3) in the paper, we know that the CEO's choice of effort is independent of the state of the world. She will exert high effort in both states iff:

$$\alpha(1-\gamma)(\Delta+\widehat{\omega}_{CEO}) \geq B \rightarrow \gamma \leq 1-\frac{B/\alpha}{\Delta+\widehat{\omega}_{CEO}}. \tag{A.10}$$

In this case, the participation constraint of new shareholders becomes

$$\gamma(I+\Delta) \geq I. \tag{A.11}$$

Reversely, she will exert low effort in both states of the world, if and only if $\gamma > 1-\frac{B/\alpha}{\Delta+\widehat{\omega}_{CEO}}$, and the participation constraint becomes $\gamma \geq 1$. Hence, in the latter case, the only feasible equity financing contract assigns full ownership to new shareholders, and the CFO obtains zero payoff. In the former case, instead, optimality from the CFO's perspective requires the participation constraint to be satisfied with equality, $\gamma_{\widehat{\omega}}^{*} = \frac{I}{I+\Delta}$, and the resulting (perceived) payoff of the CFO will be $\beta(1-\gamma_{\widehat{\omega}}^{*})E[\hat{\pi}_{CFO}(S, \text{High})] = \beta\frac{\Delta}{I+\Delta}(I+\Delta+\widehat{\omega}_{CFO}) = \beta\left(\Delta+\frac{\Delta}{I+\Delta}\widehat{\omega}_{CFO}\right) > 0$. Hence, inducing high effort is optimal if $\gamma_{\widehat{\omega}}^{*} = \frac{I}{I+\Delta}$ also satisfies the IC constraint, i.e., if $\frac{I}{I+\Delta} \leq 1-\frac{B/\alpha}{\Delta+\widehat{\omega}}$ or, solving for B/α, if $\frac{B}{\alpha} \leq \frac{\Delta+\widehat{\omega}_{CEO}}{I+\Delta}\Delta$. If, instead, $\frac{\Delta+\widehat{\omega}_{CEO}}{I+\Delta}\Delta \geq \frac{B}{\alpha}$ does not hold, the CEO cannot be induced to exert effort under any equity contract that allows new shareholders to break even. Therefore, the project is going to deliver I in expectation and the only contract satisfying equity holders' participation constraint requires $\gamma_{\widehat{\omega}}^{*} = 1$. ■

c. Proof of Proposition 2

In our setting, the CFO maximizes his utility, and therefore the value of the firm, *as perceived by him*. The proof of Proposition 2 involves computing this perceived utility for both debt and equity financing and each relevant parameter range. Because both the CEO and the CFO can be either rational or overconfident, there are four cases to consider. Below we show that, conditioning on the CEO being either overconfident or rational, an overconfident CFO will be weakly more likely to issue debt relative to a rational CFO. In other words, there are parameter ranges for which a rational CFO is indifferent between debt and equity and an overconfident CFO strictly prefers debt. Moreover, whenever the overconfident CFO strictly prefers equity, so does the rational CFO.

Below, we consider in part (i) the capital structure choice of the CFO when the CEO is rational and in part (ii) his choice when the CEO is overconfident.

For each parameter range, we compute the relevant perceived expected utility (which may differ from the actual one when the CFO is overconfident) under both debt and equity financing. By comparing the two, we can predict the chosen financing arrangement. As before, in the tables that follow, "perceived firm value" is short-hand for "expected payoff to incumbent shareholders conditioning on CFO's beliefs". Because β, the CFO's share of firm equity, does not play any role in his optimization problem as long as it is strictly positive, we will simply omit it and refer to the firm's expected value as perceived by the CFO, rather than the CFO's utility. Finally, as the relevant decision maker here is the CFO, we will use the short-hand ω rather than ω_{CFO} in order to indicate the CFO's bias.

i. Rational CEO

First, it is easy to see that whenever $\frac{\Delta^2}{I+\Delta} < B/\alpha$, any CFO will unambiguously prefer debt, as in this case $\gamma^* = 1$, for a rational CEO. We have shown, in Part b of this Online Appendix,[1] that the optimal debt contract induces the CEO to work at least in one state of the world, achieving a strictly higher firm value. Because under both an equity and a debt contract external investors must break even, any additional gain in firm value is translated into rents to incumbent shareholders (and so to the CFO), making the debt contract superior. Therefore, both types of CFOs will behave similarly and choose debt financing.

If instead $\frac{\Delta^2}{I+\Delta} \geq B/\alpha$, we need to consider several parameter ranges for either a rational or an overconfident CFO. We go over these two cases below. First, we compute the expected firm value under the beliefs of a rational CFO; second, we do the same exercise from the perspective of an overconfident CFO.

[1] Most of the arguments that follow draw heavily on parts A1.a and A1.b of this Online Appendix, and the respective proofs. For brevity of exposition, in the rest of the proof we will not invoke them explicitly.

i.a Rational CFO

We know that, if $\frac{\Delta^2}{I+\Delta} \geq B/\alpha$, a rational CEO is going to exert effort in both states of the world under the optimal equity contract. Therefore, firm value will be $\left(1-\frac{I}{I+\Delta}\right)(I+\Delta)=\Delta$. Under the optimal debt contract, we have to consider two cases: either $\sigma \leq \Delta - B/\alpha$ or $\sigma > \Delta - B/\alpha$. In the first case, because a rational CEO is going to exert effort in both states of the world, the expected firm value will be $\frac{1}{2}(I+\sigma+\Delta+I-\sigma+\Delta)-I=\Delta$. In the second case, we know that the CEO is going to work hard only in the good state of the world and shirk in the bad one, enjoying the private benefit. In this case perceived expected firm value equals actual expected firm value, which is $\frac{1}{2}(I+\sigma+\Delta-I-\sigma)=\frac{\Delta}{2}$. Comparison of the utilities just computed gives us the CFO's choice, shown in the table below.

Panel A.i.a Rational CEO and Rational CFO

Parameter Range	**Perceived Firm Value with Debt**	**Perceived Firm Value with Equity**	**Choice**
$\frac{\Delta^2}{I+\Delta} \geq B/\alpha$ and $\sigma \leq \Delta - B/\alpha$	Δ	Δ	Indifferent
$\frac{\Delta^2}{I+\Delta} \geq B/\alpha$ and $\sigma > \Delta - B/\alpha$	$\frac{\Delta}{2}$	Δ	Equity

i.b Overconfident CFO

Here things are slightly more complex because we need to take into account the fact that the CFO attributes superior skills to the CEO but that these beliefs are not shared by investors.

First, we focus on the optimal equity contract. In this case, the CFO correctly anticipates that the CEO is going to work hard in both states of the world. However, he believes incorrectly that her effort is worth $\Delta+\omega$ instead of Δ. Therefore, he expects the company to be worth $\left(1-\frac{I}{I+\Delta}\right)(I+\Delta+\omega)=\Delta+\frac{\Delta}{I+\Delta}\omega$. Regarding the debt contract, there are two cases to consider.

If $\sigma \leq \Delta - B$, the CEO is going to exert effort in both states of the world, and the face value of debt is I. Because the CFO expects her to add $\Delta + \omega$ to the value of the project, we have a perceived firm value equal to $\frac{1}{2}(I + \sigma + \Delta + \omega + I - \sigma + \Delta + \omega) - I = \Delta + \omega$.

If instead $\sigma > \Delta - B/\alpha$, the CFO correctly anticipates that the CEO is going to shirk in the bad state of the world. The expected firm value is therefore $\frac{1}{2}[(I + \sigma + \Delta + \omega - I - \sigma)] = \frac{\Delta+\omega}{2}$.

The table below summarizes these computations and the CFO's choices.

Panel A.i.b Rational CEO and Overconfident CFO

Parameter Range	**Perceived Firm Value with Debt**	**Perceived Firm Value with Equity**	**Choice**
$\frac{\Delta^2}{I+\Delta} \geq B/\alpha$ and $\sigma \leq \Delta - B/\alpha$	$\Delta + \omega$	$\Delta + \frac{\Delta}{I+\Delta}\omega$	Debt
$\frac{\Delta^2}{I+\Delta} \geq B/\alpha$ and $\sigma > \Delta - B/\alpha$	$\frac{\Delta + \omega}{2}$	$\Delta + \frac{\Delta}{I+\Delta}\omega$	Equity

Summarizing:

- If $\frac{\Delta^2}{I+\Delta} < B/\alpha$, both types of CFOs choose full debt financing;
- If $\frac{\Delta^2}{I+\Delta}\Delta \geq B/\alpha$ and $\sigma \leq \Delta - B/\alpha$, the rational CFO is indifferent between debt and equity, whereas the overconfident CFO strictly prefers debt;
- If $\frac{\Delta^2}{I+\Delta} \geq B/\alpha$ and $\sigma > \Delta - B/\alpha$, both CFOs strictly prefer equity.

i. Overconfident CEO

Similarly to the previous part, we can immediately see that if $\frac{\Delta+\omega}{I+\Delta}\Delta < B/\alpha$, any CFO will unambiguously prefer debt because in this case $\gamma^* = 1$ for an overconfident CEO. Therefore, the CEO will always shirk under an equity contract, whereas there will be at least one state of the

world in which she will exert effort under a debt contract. As before, we now need to consider separately a rational and an overconfident CFO if $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$.

ii.a Rational CFO

A rational CFO correctly anticipates that the CEO is going to exert effort in both states of the world under the optimal equity contract whenever $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$. However, he recognizes that her effort is going to be worth only Δ and correctly computes the expected value of the company as $\left(1-\frac{I}{I+\Delta}\right)(I+\Delta)=\Delta$.

Under a debt contract, we need to consider two cases. If $\sigma \leq \Delta - B/\alpha + \omega$, an overconfident CEO is going to exert effort in both states of the world. As debtholders are not expecting the firm to default, the face value of debt is I, and the CFO expects the company to be worth $\frac{1}{2}(I+\sigma+\Delta+I-\sigma+\Delta)-I=\Delta$. If instead $\sigma > \Delta - B/\alpha + \omega$, the CEO is going to shirk in the bad state of the world, inducing an equilibrium face value of debt $I+\sigma$, and thus leaving $\frac{1}{2}(I+\sigma+\Delta-(I+\sigma))=\frac{\Delta}{2}$ to existing shareholders.

The table that follows reports the relevant comparisons, along with the CFO's choice.

Panel A.ii.a Overconfident CEO and Rational CFO

Parameter Range	**Perceived Firm Value with Debt**	**Perceived Firm Value with Equity**	**Choice**
$\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ *and* $\sigma \leq \Delta - B/\alpha + \omega$	Δ	Δ	Indifferent
$\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ *and* $\sigma > \Delta - B/\alpha + \omega$	$\frac{\Delta}{2}$	Δ	Equity

ii.b Overconfident CFO

In this case, CEO and CEO have the same (incorrect) beliefs, not shared by investors. Both believe that, under an equity contract, the CEO is going to produce $\Delta + \omega$ and existing shareholders will obtain $\left(1 - \frac{I}{I+\Delta}\right)(I + \Delta + \omega) = \Delta + \frac{\Delta}{I+\Delta}\omega$.

Moving to the CFO's behavior under the optimal debt contract, first consider the case where $\sigma \leq \Delta - B/\alpha + \omega$. Here, the CFO correctly anticipates that the CEO is going to work hard in both states of the world; however, he overestimates her abilities. As a result, the perceived firm value is expected to be $\frac{1}{2}(I + \sigma + \Delta + \omega + I - \sigma + \Delta + \omega) - I = \Delta + \omega$. Now suppose that $\sigma > \Delta - B/\alpha + \omega$. Here the return in the bad state of the world is as low as to induce even the overconfident CEO to default and enjoy the private benefit. Therefore, under the CFO's incorrect beliefs, the expected value of the company is $\frac{1}{2}[(I + \sigma + \Delta + \omega - (I + \sigma)] = \frac{\Delta+\omega}{2}$. We can now predict the CFO's choice, reported in the table below.

Panel A.ii.b Overconfident CEO and Overconfident CFO

Parameter Range	**Perceived Firm Value with Debt**	**Perceived Firm Value with Equity**	**Choice**
$\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ *and* $\sigma \leq \Delta - B/\alpha + \omega$	$\Delta + \omega$	$\Delta + \frac{\Delta}{I+\Delta}\omega$	Debt
$\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ *and* $\sigma > \Delta - B/\alpha + \omega$	$\frac{\Delta+\omega}{2}$	$\Delta + \frac{\Delta}{I+\Delta}\omega$	Equity

Therefore, we have:

- If $\frac{\Delta+\omega}{I+\Delta}\Delta < B/\alpha$, both types of CFOs choose full debt financing;
- If $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ and $\sigma \leq \Delta - B/\alpha + \omega$, the rational CFO is indifferent between debt and equity, whereas the overconfident CFO strictly prefers debt;
- If $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ and $\sigma > \Delta - B/\alpha + \omega$, both types of CFO prefer equity.

To summarize, for a given CEO type we have:

- If the rational CFO strictly prefers debt, so does the overconfident CFO;
- If the rational CFO is indifferent between debt and equity, the overconfident CFO strictly prefers debt;
- If the rational CFO strictly prefers equity, so does the overconfident CFO.

Taken together, these results imply that, conditioning on the CEO's type, an overconfident CFO weakly prefers debt relative to a rational CFO. ■

d. Proof of Proposition 3

The proof follows directly from Proposition 2, after examining how the CFO's choices vary based on parameter conditions and CEO bias.

More specifically, the CEO will anticipate that an overconfident and a rational CFO may have different preferences regarding the optimal funding source. In this case, to the extent that her expected utility, which is affected by her possibly biased beliefs, depends upon the CFO's choice between debt and equity, she may prefer to appoint a CFO who is more likely to make her favored financing choice. Of course, any CEO will be indifferent between the two types of CFOs if she expects them to make the exact same financing choice. Therefore, we need to restrict our analysis to the cases, in which, given the CEO's bias, the two types of CFOs may behave differently.

We start by considering the rational CEO's choice. From Part c, Section (i) of this Appendix, we know that if $\frac{\Delta^2}{I+\Delta}\Delta \geq B/\alpha$ and $\sigma \leq \Delta - B/\alpha$, the overconfident CFO will strictly prefer debt but the rational CFO will be indifferent. In this case a rational CEO is indifferent between a debt and an equity contract, as she expects to obtain $\alpha\Delta$ in both types of CFO. Therefore, she will not exhibit any preference regarding the CFO to be appointed.

Moving to an overconfident CEO's choice, from Part c, Section (ii) of this Appendix, we know that if $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B$ and $\sigma \leq \Delta - B + \omega$, the rational CFO is indifferent between debt and equity, whereas the overconfident CFO strictly prefers debt. With debt financing, the

overconfident CEO expects to obtain $\alpha(\Delta+\omega)$; with equity her payoff will be $\alpha\left(\Delta+\frac{\Delta}{I+\Delta}\omega\right)$. Therefore, under the CEO's beliefs, debt strictly dominates equity. This implies that she will prefer an overconfident CFO, who is going to choose debt financing for sure, to a rational CFO, who instead may choose equity.

In sum, a rational CEO is indifferent between appointing an overconfident or a rational CFO; an overconfident CEO will weakly[2] prefer an overconfident CFO to a rational one. ■

e. Robustness of the Theoretical Framework to parameter assumptions

We now provide a detailed discussion of the robustness of our results to removing either of our two main assumptions regarding the extent of the moral hazard problem for the rational CEO ($\Delta > B/\alpha$) and for the overconfident CEO ($B/\alpha \geq \omega$).

i. Assume $B/\alpha \geq \Delta$

If $B/\alpha > \Delta$, a rational CEO never exerts effort, as none of the IC constraints can be satisfied conditioning on investors breaking even. The optimal debt contract will thus be $D_0^* = 1+\sigma$. For the equity case she is also able to obtain funding but the value of the project to incumbent shareholders will be equal to zero (in particular, $\gamma_0^* = 1$). Only in the knife-edge case $B/\alpha = \Delta$, it is still possible to induce the rational CEO to exert high effort in the good state of the world (but only under a debt contract), by keeping her indifferent between shirking and working hard (again $D_0^* = 1+\sigma$).

Although this assumption affects the rational CEO's effort decision, it does not alter the main insight that overconfidence can ameliorate conditional financing terms as it helps overcome the moral hazard problem. In particular, if $B/\alpha > \Delta$ but $\omega \geq B/\alpha - \Delta$, it is still possible to induce an overconfident CEO to exert effort (either in both states of the world or only in the good one), at least under a debt contract.

[2] We use the expression "*weakly* prefers an overconfident CFO" because we have not specified how to break indifference, i.e., how a CFO behaves when indifferent between debt and equity. If, for example, we assumed that whenever indifferent a CFO randomizes between the two financing choices (with positive probability for both debt and equity), an overconfident CEO will *strictly* prefer an overconfident CFO to a rational one.

ii. Assume $\omega > B/\alpha$

The assumption $\omega \leq B/\alpha$ that we made in the main text is more relevant to our analysis. It means that the discrepancy in beliefs between the overconfident CEO and debtholders is not too large and ensures that whenever the CEO exerts effort, she does not default. We analyze how removing this assumption affects the optimal debt contract and CFO's choice between debt and equity.

ii.a Optimal debt contract

If we assume that $\omega > B/\alpha$, there is an additional case to consider in the optimal debt contract, in which the overconfident CEO may exert effort in the bad state of the world but still default. In particular, consider the constraint $IC_{D,Bad}$:

$$(IC_{D,Bad}) \qquad \alpha \cdot \max\{0, I - \sigma + \Delta + \widehat{\omega}_{CEO} - D\} \geq \alpha \cdot \max\{0, I - \sigma - D\} + B \qquad (A.11)$$

There are two additional subcases. First, suppose that $\sigma \leq \Delta - 1/2\,(B/\alpha - \omega)$. In this case the optimal contract for the overconfident CEO requires $D^*_\omega = I + \sigma - \Delta$. Plugging D^*_ω into the constraint (A.11) we get:

$$\alpha \cdot \max\{0, I - \sigma + \Delta + \omega - (I + \sigma - \Delta)\} \geq \alpha \cdot \max\{0, I - \sigma - (I + \sigma - \Delta)\} + B \quad (A.12)$$

or:

$$\alpha \cdot (2\Delta - 2\sigma + \omega) \geq B. \qquad (A.13)$$

which is satisfied under $\sigma \leq \Delta - 1/2\,(B/\alpha - \omega)$. The overconfident CEO will mistakenly expect not to default after exerting high effort; however, debtholders will correctly anticipate that they will receive only $I - \sigma + \Delta$ in the bad state of the world. At the same time, $IC_{D,Good}$ is satisfied, delivering $I + \sigma - \Delta$ to debtholders in the good state of the world. Therefore, debtholders will break even in expectation. The proofs of optimality and uniqueness are similar to those in Part A1.a of this appendix and are omitted for brevity.

Now consider the subcase $\sigma > \Delta - 1/2\,(B/\alpha - \omega)$. Here, it is not possible to induce the overconfident CEO to exert effort and simultaneously ensure debtholders to break even. Intuitively, any debt contract that induces effort in the bad state of the world would require a face value of debt too low to be able to satisfy debtholders' participation constraint.

Without making any assumption on the relative size of ω and B/α, we conclude that the optimal debt contract for an overconfident CEO is given by:

- $D_\omega^* = I + \sigma \; if \; \sigma > \Delta - B/\alpha + \omega$ or $\Delta - 1/2\,(B/\alpha - \omega) < \sigma \wedge \sigma > \Delta$;
- $D_\omega^* = I + \sigma - \Delta \; if \; \Delta - 1/2\,(B/\alpha - \omega) \geq \sigma > \Delta$;
- $D_\omega^* = I \; if \; \Delta - B/\alpha + \omega \geq \sigma$ and $\Delta \geq \sigma$.

Thus, although the optimal debt contract becomes slightly more complicated in the more general case, the basic insight of Proposition 1 remains unaffected, with overconfidence reducing the cost of debt when profit variability is large but not extreme.

ii.b. Financing choice

Moving to the analysis of the CFO's choice between debt and equity, we find that if $\omega > B/\alpha$, the different structure of the optimal debt contract can affect the overconfident CFO's preference between debt and equity whenever:

(i) The CEO is overconfident, with bias ω;

(ii) $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ (i.e., equity financing is available with $\gamma_\omega^* = I/(I+\Delta)$)

(iii) $\Delta - 1/2\,(B/\alpha - \omega) \geq \sigma > \Delta$.

In this case, the rational CFO will be indifferent between debt and equity. The reason is that he will correctly anticipate that the CEO will default in the bad state of the world but, because of the lower cost of debt, firm value will still be maximized. In particular, the *unbiased* expected value of the firm is $\big(I + \sigma + \Delta + \; 0 - (I + \sigma - \Delta)\big)/2 = \Delta$. This is equivalent to the firm value obtained under an equity contract, making him indifferent between the two funding choices.

For an overconfident CFO (who, as usual, we assume to share the same bias ω of the CEO) the *perceived* expected firm value under optimal debt contract $D_\omega^* = I + \sigma - \Delta$ will be equal to $(I + \sigma + \Delta + \omega + I - \sigma + \Delta + \omega)/2 - (I + \sigma - \Delta) = 2\Delta + \omega - \sigma$. Therefore, he will (weakly) prefer debt if:

$$2\Delta + \omega - \sigma \geq \Delta + \frac{\Delta}{I + \Delta}\omega \tag{A.14}$$

Without further assumptions we cannot establish whether (A.14) holds or not. Notice, however, that this inequality reduces to:

$$\omega \frac{I}{I+\Delta} \geq \sigma - \Delta. \tag{A.15}$$

Importantly, the left-hand side of this expression is increasing in ω. This means that we can always find a sufficiently large value for ω such that (A.15) holds. In particular, we can exploit the fact that $\sigma \leq I$. Replacing $\sigma = I$ in (A.15) and rearranging terms, we get:

$$\omega \geq I - \frac{\Delta^2}{I}. \tag{A.16}$$

In other words, the overconfident CFO displays a preference for debt for *sufficiently high overconfidence*, with expression (A.16) providing a lower bound for ω. Note that this kind of indeterminacy result for certain parameter ranges is common when debt is very risky (see for example the model in Malmendier, Tate and Yan (2011)). Here, however, the main contribution is to distinguish the role of CEO and CFO's traits, with the latter dominating in financing choices.[3]

[3] Note that, even for this particular case, we can find parameter ranges such that relaxing our maintained assumptions on ω and B/α actually strengthen our result. For example, if $\frac{\Delta+\omega}{I+\Delta}\Delta \geq B/\alpha$ and $\sigma > \Delta - B/\alpha + \omega$, our analysis in subsection A1.c implies that both an overconfident and a rational CFO will prefer equity. However, this result hinges on the restriction $\omega \leq B/\alpha$. If we ignore this assumption, an overconfident CFO may actually strictly prefer debt over equity, *reinforcing* our main prediction. As is clear from inspection of Panel A.ii.b, this will occur if $\frac{\Delta+\omega}{2} > \Delta + \frac{\Delta}{I+\Delta}\omega$ or, equivalently, if $\omega > \Delta\frac{I+\Delta}{I-\Delta}$ and $I > \Delta$.

A2. Variable Definitions

Below, we provide detailed definitions of the variables used in the empirical sections of the paper. For the variables extracted from the Annual Compustat file, we also provide the data item number.

Manager Variables	constructed from Thomson Insider Filing Dataset, CRSP and Execucomp
LTCEO/LTCFO	a binary variable where 1 signifies that the CEO/CFO at some point during his tenure held exercisable options until the last year before expiration, given that the options were at least 40% in the money entering their last year.
Stock Ownership	option-excluded shares held by the CEO/CFO as a percentage of common shares outstanding.
Vested Options	the number of exercisable options held by the CEO/CFO as a percentage of common shares outstanding.
Firm Variables	constructed from Compustat, SDC, Dealscan
Net Debt Issues ($m)	long term debt issuance (item 111) - long term debt reduction (item 114).
Net Debt Issues Indicator (Compustat)	a binary variable where 1 signifies that Net Debt Issues during the year is positive.
Net Debt Issues Indicator SDC	a binary variable where 1 signifies that the company issued bonds during the year
Book Leverage	(long-term debt (item 9) + debt in current liabilities item 34)) / (long-term debt (item 9) + debt in current liabilities (item 34) + common equity (item 60)).

A2. Variable Definitions – *Continued*

Net Financing Deficit($m)	cash dividends (item 127) + investment + change in working capital – cash flow after interest and taxes.
	investment is items 128 + 113 + 129 + 219 - 107 - 109 for firms with cash flow format code 1 to 3; and is items 128 + 113 + 129 - 107 - 109 - 309 – 310 for firms with cash flow format code 7; and is 0 for other firms.
	change in working capital is items 236 + 274 + 301 for firms with cash flow format code 1; and is items −236 + 274 – 301 for firms with cash flow format code 2 and 3; and is items −302 − 303 − 304 − 305 − 307 + 274 − 312 – 301 for firms with cash flow format code 7; and is 0 for other firms.
	cash flow after interest and taxes is items 123 + 124 + 125 + 126 + 106 + 213 + 217 + 218 for firms with cash flow format code 1 to 3; and is items 123 + 124 + 125 + 126 + 106 + 213 + 217 + 314 for firms with cash flow format code 7; and is 0 for other firms.
Book Leverage	(long-term debt (item 9) + debt in current liabilities item 34)) / (long-term debt (item 9) + debt in current liabilities (item 34) + common equity (item 60)).
Market Leverage	(long-term debt (item 9) + debt in current liabilities item (34)) / (price (item 199) x common shares outstanding (item 25) + debt in current liabilities (item 34) + long-term debt (item 9)).
Q	(assets (item 6) + price (item 199) x common shares outstanding (item 25) – common equity (item 60) - balance sheet deferred taxes and investment tax credit (item 35)) / assets (item 6).
Profitability	operating profit (item 13) / lagged assets (item 6).
Changes in Profitability	profitability - lagged profitability.
Tangibility	property, plants and equipment (item 8) / lagged assets (item 6).
Changes in Tangibility	tangibility - lagged tangibility.
log(Sales)	Log(sales (item12)).

A2. Variable Definitions – *Continued*

Changes in log(Sales)	Log(sales) - lagged Log(sales).
log(Interest Spread)	difference between the interest rate the borrower pays in basis points and the London Interbank Offered Rate (variable *allindrawn* in Dealscan)
Z-Score	1.2 × (current assets - current liabilities) / total assets + 1.4 × (retained earnings / total assets) + 3.3 × (pretax income / total assets) + 0.6 × (market capitalization / total liabilities) + 0.9 × (sales / total assets).
Earnings Volatility	ratio of the standard deviation of the past eight earnings changes to the average book asset size over the past eight quarters. Earnings are defined as Sales – Cost of Goods Sold – Selling, General and Administrative Expenses
log(Amount)	natural logarithm of the amount of the loan (in million dollars)
Analysts' Coverage	number of analysts making at least one annual earnings forecast in a given year
Coefficient of Variation of Earnings Estimates	standard deviation of annual earnings forecasts divided by the absolute value of the mean forecast. We require at least ten forecasts made.

A3. Robustness checks

We provide a series of robustness checks for all of our empirical results in the paper. Most tables (A2-A7 and A9) show the estimation results if we use Otto's (2014) related empirical measure of CEO overconfidence. Under this measure overconfidence is measured as the average of transaction-specific classifications. For each option exercise of an executive, the transaction-specific dummy takes the value one if the options were exercised within one year of their expiration date and at least 40% in the money at the end of the preceding year. Otherwise, the dummy takes the value zero. The final measure for each executive averages the value of the optimism dummies across transactions, weighting each exercise observation by the number of options that were exercised.[4] Therefore, the measure is a continuous variable that can take values between 0 and 1, rather than a dummy. We repeat all our empirical analysis using this measure and show the results below, omitting the coefficients on the control variables for brevity. The specifications and the control variables are exactly the same, except in Table A8 (CFO Hiring) where, given the nature of our dependent variable, we estimate a Tobit rather than a logit model.

In addition, we perform a large array of robustness checks on the non-monotonicity result show in Table VII. In Table A8, we use our main overconfident measure (same as in the main text) and employ a broad array of subsampling cutoffs.

[4] Similarly to Otto (2014), we have redone our analysis weighting each transactions by the profit made or without weighting at all, and found very similar results. These analyses are available upon request.

Table A2
Debt Issues (Compustat)

Table A2 has logit regressions with the Net Debt Issues Indicator as the dependent variable, regressed on Otto (2014)'s measure of overconfidence for CEOs and CFOs and several control variables, defined in Table II. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Longholder CEO	0.219	0.295			0.035	0.086	0.023
	(1.069)	(1.499)			(0.160)	(0.390)	(0.108)
Longholder CFO			0.600**	0.828***	0.582**	0.785***	0.854***
			(2.225)	(3.386)	(2.079)	(2.765)	(3.310)
Observations	2,582	2,582	2,582	2,582	2,582	2,582	2,582
Pseudo R-Squared	0.044	0.153	0.047	0.157	0.047	0.099	0.157
Industry FE	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	YES	NO	YES	NO	YES	YES
Firm Controls	NO	YES	NO	YES	NO	NO	YES
Manager Controls	NO	YES	NO	YES	NO	YES	YES

Table A3
Debt Issues (SDC)

Table A3 presents the results for logit regressions with a binary variable equal to one if the firm issued debt during the fiscal year, conditioning on having issued debt, equity or hybrid securities. Regressors include Otto (2014)'s measure of overconfidence for CEOs and CFOs and several control variables, defined in Table III. Data on public issues are from SDC. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Longholder CEO	0.318	0.949*			0.277	0.524	1.275**
	(0.664)	(1.706)			(0.533)	(0.861)	(2.033)
Longholder CFO			0.314	0.240	0.147	0.506	-0.546
			(0.482)	(0.295)	(0.209)	(0.557)	(-0.581)
Observations	569	515	569	493	569	503	492
Pseudo R-Squared	0.080	0.543	0.079	0.544	0.800	0.218	0.549
Industry FE	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	YES	NO	YES	NO	YES	YES
Firm Controls	NO	YES	NO	YES	NO	NO	YES
Manager Controls	NO	YES	NO	YES	NO	YES	YES

Table A4
Financing Deficit

Table A4 replicates the specification in Table IV, using Otto (2014)'s measure of overconfidence for CEOs and CFOs and. Control variables are defined in Table IV. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FD x Longholder CEO	0.010	0.052	0.177				-0.075	0.008	0.074
	(0.0506)	(0.29)	(1.002)				(-0.300)	(0.039)	(0.507)
FD x-Longholder CFO				0.282	0.169	0.112	0.328	0.164	0.063
				(0.803)	(0.546)	(0.726)	(0.818)	(0.45)	(0.333)
FD	0.189***	0.151***	0.505***	0.161***	0.146**	0.497***	0.173***	0.144***	0.532***
	(2.676)	(2.927)	(3.882)	(2.595)	(2.497)	(3.375)	(2.735)	(2.809)	(3.973)
Longholder CEO	-0.0184	-0.010	0.004				-0.012	-0.008	0.028
	(-0.790)	(-0.385)	(-0.208)				(-0.532)	(-0.304)	(1.19)
Longholder CFO				0.000	0.006	0.003	0.004	0.005	-0.011
				(0.005)	(0.189)	(0.105)	(0.119)	(0.147)	(-0.287)
Observations	3,984	3,984	3,984	3,984	3,984	3,984	3,984	3,984	3,984
R-squared	0.184	0.283	0.404	0.195	0.285	0.443	0.197	0.286	0.445
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	YES	YES	NO	YES	YES	NO	YES	YES
Firm Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
Manager Cont.	NO	YES	YES	NO	YES	YES	NO	YES	YES
FD X Man. Int..	NO	NO	YES	NO	NO	YES	NO	NO	YES

Table A5
Leverage

Table A5 presents the results for OLS regressions with market leverage as dependent variable regressed on Otto (2014)'s measure of overconfidence for CEOs and CFOs and several control variables, defined in Table V. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Longholder CFO			0.151***	0.136***	0.141***	0.132***	0.131***	0.132***
			(4.186)	(3.969)	(3.573)	(3.513)	(3.497)	(3.494)
Longholder CEO	0.053**	0.041*			0.026	0.016	0.014	0.014
	(2.056)	(1.728)			(1.035)	(0.667)	(0.598)	(0.585)
Observations	3,964	3,964	3,964	3,964	3,964	3,964	3,964	3,964
R-squared	0.098	0.147	0.104	0.153	0.105	0.154	0.166	0.174
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm Controls	NO	YES	NO	YES	NO	YES	YES	YES
Manager Contr.	NO	YES	NO	YES	NO	YES	YES	YES
Return t-1	NO	NO	NO	NO	NO	NO	NO	YES
Returns t-2 – t-5	NO	NO	NO	NO	NO	NO	NO	NO

Table A6
Net Interest Rates

Table A6 presents regressions of Log(Interest Spread) on Otto (2014)'s overconfidence measures for CEOs and CFOs and several control variables (defined in Table VI), including year and industry fixed-effects. Log(Interest Spread) is the difference between the interest rate the borrower pays in basis points and the London Interbank Offered Rate (variable *allindrawn* in DealScan). ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Longholder CEO	-0.121	-0.178**			-0.155	-0.094	-0.052
	(-1.012)	(-2.296)			(-1.207)	(-1.063)	(-0.641)
Longholder CFO			0.021	-0.207**	0.100	-0.164	-0.172*
			(0.128)	(-2.289)	(0.590)	(-1.543)	(-1.786)
Observations	1,632	1,632	1,632	1,632	1,632	1,632	1,632
R-squared	0.408	0.621	0.407	0.625	0.409	0.626	0.674
Industry FE	YES	YES	YES	YES	YES	YES	YES
Year-Quarter FE	YES	YES	YES	YES	YES	YES	YES
Firm Controls	NO	YES	NO	YES	NO	YES	YES
Manager Controls	NO	YES	NO	YES	NO	YES	YES
Loan Type FE	NO	NO	NO	NO	NO	NO	YES

Table A7
Net Interest Rates Across Subsamples

Panel A, B and C present regressions of Log(Interest Rate Spread) on our measures of overconfidence and several control variables in different subsamples. Every year we divide our companies according to their (lagged) earnings volatility (Panel A), analysts' coverage (Panel B), coefficient of variation of earnings estimates (CV) (Panel C) in terciles. Then, we run our empirical specification (9) in each subgroup. Control variables (not showed) are as in Column 7 of Table VI. We also include Industry, Year-Quarter and Loan Type fixed effects in each regression. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

Panel A
Sorting by Earnings Volatility

	(1) Low Earnings Volatility	(2) Medium Earnings Volatility	(3) High Earnings Volatility
Longholder CEO	-0.061	-0.260*	-0.087
	(-0.438)	(-1.755)	(-0.672)
Longholder CFO	-0.174	-0.106	0.016
	(-1.136)	(-0.774)	(0.094)
Observations	557	544	531
R-squared	0.802	0.734	0.765

Panel B
Sorting by Analysts' Coverage

	(1) Low Coverage	(2) Medium Coverage	(3) High Coverage
Longholder CEO	-0.183	-0.182	0.124
	(-1.579)	(-1.194)	(0.735)
Longholder CFO	-0.071	-0.026	-0.399***
	(-0.521)	(-0.144)	(-2.626)
Observations	583	540	509
R-squared	0.683	0.744	0.781

Panel C
Sorting by Coefficient of Variation of Earnings Estimates

	(1) Low CV	(2) Medium CV	(3) High CV
Longholder CEO	-0.338	0.077	0.404**
	(-1.572)	(0.302)	(2.079)
Longholder CFO	-0.116	0.164	-0.477*
	(-0.640)	(0.641)	(-1.743)
Observations	309	299	286
R-squared	0.867	0.831	0.801

Table A8
Net Interest Rates Across Subsamples (Different Cutoffs)

Table A8 presents a series of robustness checks of the relation between CEO overconfidence and the cost of debt across different subsamples, using different cutoffs for bottom, medium, and top for each sorting variable (Earnings Volatility, Analysts Coverage and Coefficient of Variation of Earnings Forecasts).All panels show regressions of Log(Interest Rate Spread) on our measures of overconfidence and several control variables in three subsamples, divided according to their (lagged) Earnings Volatility (Panel A), Analysts Coverage (Panel B), Coefficient of Variation of Earnings Estimates (Panel C). We estimate the empirical model specified in equation (9) in the main text in each subsample. Control variables (not shown) are as in Column 7 of Table VI. We include Industry, Year-Quarter and Loan Type fixed effects in each regression. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

Panel A
Sorting by Earnings Volatility

	Bottom 35%	Medium 30%	Top 35%
Longholder CEO	-0.087	-0.304***	-0.131
	(-1.408)	(-3.102)	(-1.572)
Longholder CFO	-0.108*	0.043	-0.018
	(-1.694)	(0.490)	(-0.235)
Observations	591	490	560
	Bottom 30%	Medium 40%	Top 30%
Longholder CEO	-0.069	-0.231***	-0.176*
	(-1.053)	(-3.204)	(-1.938)
Longholder CFO	-0.109	0.033	0.029
	(-1.641)	(0.452)	(0.361)
Observations	508	658	475
	Bottom 25%	Medium 50%	Top 25%
Longholder CEO	-0.005	-0.168**	-0.204*
	(-0.065)	(-2.514)	(-1.935)
Longholder CFO	-0.105	0.016	-0.002
	(-1.262)	(0.250)	(-0.024)
Observations	427	815	399
	Bottom 20%	Medium 60%	Top 20%
Longholder CEO	-0.007	-0.141**	-0.184
	(-0.074)	(-2.319)	(-1.578)
Longholder CFO	-0.077	-0.008	-0.006
	(-0.703)	(-0.153)	(-0.058)
	Bottom 15%	Medium 70%	Top 15%
Longholder CEO	-0.046	-0.115**	-0.153
	(-0.409)	(-2.031)	(-0.909)
Longholder CFO	-0.214**	-0.018	-0.030
	(-2.056)	(-0.324)	(-0.207)
Observations	267	1,141	233

Panel B
Sorting by Analysts Coverage

	Bottom 35%	Medium 30%	Top 35%
Longholder CEO	-0.053	-0.221**	-0.020
	(-0.819)	(-2.396)	(-0.208)
Longholder CFO	-0.055	-0.085	-0.058
	(-0.857)	(-0.910)	(-0.745)
Observations	636	480	525
	Bottom 30%	Medium 40%	Top 30%
Longholder CEO	-0.091	-0.174**	0.019
	(-1.298)	(-2.346)	(0.176)
Longholder CFO	-0.048	-0.084	-0.065
	(-0.681)	(-1.157)	(-0.740)
Observations	564	619	458
	Bottom 25%	Medium 50%	Top 25%
Longholder CEO	-0.082	-0.120*	-0.050
	(-1.122)	(-1.955)	(-0.433)
Longholder CFO	-0.046	-0.080	-0.043
	(-0.629)	(-1.166)	(-0.400)
Observations	497	784	360
	Bottom 20%	Medium 60%	Top 20%
Longholder CEO	-0.045	-0.148**	0.022
	(-0.580)	(-2.526)	(0.178)
Longholder CFO	-0.151*	-0.058	-0.197
	(-1.925)	(-0.862)	(-1.653)
Observations	387	963	291
	Bottom 15%	Medium 70%	Top 15%
Longholder CEO	-0.034	-0.155***	0.104
	(-0.372)	(-2.712)	(0.766)
Longholder CFO	-0.191**	-0.040	-0.303**
	(-2.225)	(-0.665)	(-2.350)
Observations	318	1,109	214

Panel C
Sorting by Coefficient of Variation of Earnings Estimates

	Bottom 35%	Medium 30%	Top 35%
Longholder CEO	-0.201**	-0.399***	0.081
	(-2.222)	(-2.938)	(0.614)
Longholder CFO	-0.197**	0.015	-0.166
	(-2.087)	(0.128)	(-1.144)
Observations	333	268	291
	Bottom 30%	Medium 40%	Top 30%
Longholder CEO	-0.193**	-0.243**	0.066
	(-1.995)	(-2.031)	(0.500)
Longholder CFO	-0.212**	-0.039	-0.176
	(-2.142)	(-0.381)	(-1.143)
Observations	292	354	246
	Bottom 25%	Medium 50%	Top 25%
Longholder CEO	-0.258***	-0.261***	0.031
	(-2.710)	(-2.904)	(0.167)
Longholder CFO	-0.244**	0.045	-0.169
	(-2.301)	(0.507)	(-0.921)
Observations	243	446	203
	Bottom 20%	Medium 60%	Top 20%
Longholder CEO	-0.221*	-0.164**	0.052
	(-1.886)	(-2.120)	(0.238)
Longholder CFO	-0.246***	-0.014	-0.270
	(-2.903)	(-0.171)	(-1.184)
Observations	194	538	160
	Bottom 15%	Medium 70%	Top 15%
Longholder CEO	-0.267	-0.077	-0.120
	(-0.922)	(-0.971)	(-0.380)
Longholder CFO	-0.323	-0.056	-0.593**
	(-1.533)	(-0.701)	(-2.043)
Observations	157	614	121

Table A9
CFO Hiring

Table A9 has Tobit regressions with Longholder CFO as the dependent variable. The sample includes all instances, in which a new CFO is appointed between year $t-1$ and year t and the following variables are not missing: (i) the overconfidence proxy for the new CFO at time t; (ii) the overconfidence proxy for the incumbent CEO at time $t-1$; (iii) firm and manager's control variables at time $t-1$. We follow Otto (2014) in the construction of our overconfidence proxy. Firm and manager control variables are as in Table VIII. ***, ** and * indicate statistically different from zero at the 1%, 5%, and 10% level of significance, respectively.

	(1)	(2)	(3)	(4)
Longholder CEO	0.466***	0.477***	0.554***	0.537***
	(4.098)	(4.607)	(5.022)	(4.960)
Observations	175	175	175	175
Pseudo R-Squared	0.207	0.292	0.336	0.345
Year FE	YES	YES	YES	YES
Industry FE	NO	YES	YES	YES
Manager Controls	NO	NO	YES	YES
Firm Controls	NO	NO	NO	YES