



Corporate Finance Theory - Home assignment.

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- Ordinary

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Problem 1

(a)

Tirole (2006) describes the pledgeable income as;

$$P = p_H(R - \frac{B}{\Delta p})$$

where $R - \frac{B}{\Delta p}$ is the highest income that can be pledged to the lender in case of success without risking the borrower's incentive constraint, (Tirole, 2006). p_H is the probability of success if the entrepreneur behaves, and $\Delta p = p_H - p_L$ is defined as the difference between the probabilities of success when the entrepreneur behaves and misbehaves. In other words, pledgeable income is the portion of a project's income that can be promised to the lenders as a form of security. It plays an important role in determining the borrowing capacity, since it affects the willingness of lenders to invest in a given project.

In the context of moral hazard, the entrepreneur/borrower might gain a private benefit (B) by mismanaging the project, thereby reducing the probability of the project's success denoted as p_L , (Tirole, 2006). This implies that not all of the project's income can be pledged to the lender. Therefore, the pledgeable income differs from the project's NPV when the lender must consider the need to keep the borrower sufficiently invested in the project, and not misbehave and take the private benefit. This is described in the above equation by the following element $\frac{B}{\Delta p}$. This implies that the pledgeable income is lower with in the setting of moral hazard, which also lowers the project's NPV.

(b)

The provided claim is false. From the article by Banal-Estañol et al. (2013), the entrepreneur never chooses joint financing with contamination. Furthermore, Banal-Estañol et al. (2013) claims that when project returns are negatively correlated, it is always optimal to finance projects jointly, since the risk-contamination effect in this case is absent, and the coinsurance effect is so strong that intermediate default can be avoided when projects are financed jointly.

This is because the poor performance of one project is offset by the good performance of another, reducing the overall default risk.

However, an increase in the correlation of projects' returns above -1 will make separate financing more optimal, due to a reduction of coinsurance benefits. With positive correlation, the projects behave more similarly, which implies that if one project performs well, so will the second project. This reduces the diversification benefit, and consequently, the size of the coinsurance gains from joint financing decreases. Conversely, the risk-contamination effect increases with positive correlation due to the fact that if one project performs poorly, it is likely the other will too, increasing the risk of default. Therefore, joint financing can lead to significant risk-contamination losses, as the poor performance of one project adversely affects the financial stability of the other.

Lastly, Banal-Estañol et al. (2013) points out that if projects have perfectly positive correlation, the firm is indifferent between choosing separate or joint financing. In this scenario, the correlation of project returns also significantly impacts the size of the 'coinsurance gains' and the 'risk-contamination losses', but in a specific way: it neutralises both of these effects. The reason for this is that with perfect positive correlation, projects are already perfectly aligned in their performance. The risk of one is inherently the risk of the other; thus, there is no additional 'contamination' occurring. Additionally, the diversification benefit disappears because the risks and returns of the projects are identical.

(c)

In an IPO, the payoff to the entrepreneur is higher if the firm's quality is high. This is because, in an IPO, the entrepreneur is concerned with both the share price at which he can issue shares, which depends on investor beliefs about quality, but also with the expected future value of the shares he retains, such as his long-term stake in the firm. The expected value of his long-term stake is greater for a high-quality firm than a low-quality firm, because high-quality firms can better compete in the product market. Therefore, more high-quality firms are choosing an IPO, as opposed to low-quality firms, which signals to investors that

high-quality firms prefer IPOs.

One difference with the Pecking Order Theory is that, according to Myers (2001), this theory suggests a more cautious interpretation of equity issuance. This theory suggests that firms prefer internal financing over external, and within external financing, debt is preferred over equity. The theory posits that equity issuance, opposite to IPO, sends a negative signal that the firm has exhausted other, less risky financing options, and this might be the last resort.

Therefore, while Bayar and Chemmanur (2011) associate the choice of an IPO with a positive signal of high firm quality and the entrepreneur's confidence in the firm's future, the Pecking Order Theory implies a more cautious view where equity issuance could be interpreted as a negative signal for a low-quality firm, potentially indicating financial constraints.

Problem 2

(a)

The investor is unsure of the quality of the project. Therefore, they assign a probability α that the project is of high quality, with a probability of success p_H , and a $(1 - \alpha)$ probability that the project is of low quality with a success probability of p_L .

The project investment costs I , and the probability of success is increased by τ irrespective of the initial quality of the project. Therefore, the new probabilities of success are $p_H + \tau$ for high quality and $p_L + \tau$ for low quality.

If the investor decides to fund the project, their expected return depends on the project's success. If the project succeeds, the investor receives R_I and zero otherwise. Therefore, the expected return for the investor is the weighted average of the above-explained outcomes, considering their beliefs about the project's quality.

Lastly, for the investor to be willing to fund the project, his expected return from the project

must be at greater or equal to the amount he lends to the entrepreneur I , which is the initial investment cost.

Now I will utilise the above thoughts to derive the expected return from the investment:

- Expected return for the high-quality project: $(p_H + \tau) \cdot R_l$
- Expected return for the low-quality project: $(p_L + \tau) \cdot R_l$
- The investor weighs the returns equally with α and $(1 - \alpha)$, since he does not know the actual quality of the project

Combining these yields following expected return:

$$\alpha(p_H + \tau) \cdot R_l + (1 - \alpha)(p_L + \tau) \cdot R_l$$

For the investor to break-even, this expected return must be at least equal to the lended investment amount I :

$$\alpha(p_H + \tau) \cdot R_l + (1 - \alpha)(p_L + \tau) \cdot R_l \geq I$$

Rearranging above term gives the break-even constraint seen in question (a):

$$[\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)]R_l \geq I \quad (1)$$

(b)

If the project succeeds, then it yields a cash flow of R . The entrepreneur must payback the investor R_l in case of project success regardless of the quality of the project. Therefore, the net cash flow for the entrepreneur is $(R - R_l)$, and by using the above explanation about the success probability, it yields $(p_i + \tau)$, and since the entrepreneur knows if the project is of high and low-quality, there is no α parameter. Putting this together, the expected payoff for the entrepreneur is given by:

$$(p_i + \tau)(R - R_l) \quad (2)$$

(c)

Firstly, I isolate R_l in equation (1)

$$R_l \geq \frac{I}{[\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)]} \quad (3)$$

Next, I insert equation (3) into equation (2):

$$(p_i + \tau)(R - \frac{I}{[\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)]})$$

Now, I rearrange the terms:

$$\begin{aligned} p_i R + \tau R - p_i \frac{I}{[\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)]} - \tau \frac{I}{[\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)]} &\Leftrightarrow \\ p_i R + \tau R - (p_i + \tau) \left(\frac{1}{\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)} \right) I &\Leftrightarrow \\ p_i R + \tau R - \frac{p_i + \tau}{\alpha(p_H + \tau) + (1 - \alpha)(p_L + \tau)} I &\Leftrightarrow \\ p_i R + \tau R - \frac{p_i + \tau}{\alpha p_H + \alpha \tau + p_L + \tau - \alpha p_L - \alpha \tau} I &\Leftrightarrow \\ p_i R + \tau R - \frac{p_i + \tau}{\alpha p_H + p_L + \tau - \alpha p_L} I &\Leftrightarrow \end{aligned}$$

Finally, I can show that the entrepreneur's expected payoff can be written as

$$p_i R + [\tau R - \left(\frac{p_i + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau} \right) I]$$

(d)

Using the answer in part (c), I can show that the entrepreneur with a high-quality project will have an incentive to actually raise funds to make the investment:

The entrepreneur is incentivised to invest if the expected payoff from investing is greater or equal to the cash flow R times the probability of success, p_H minus the the deepening

investment costs I . This yields the following equation:

$$p_H R + [\tau R - (\frac{p_H + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau})I] - I \geq p_H R - I \Leftrightarrow$$

Rearranging the terms gives the following expression:

$$\begin{aligned} \tau R - I &\geq (\frac{p_H + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau} - 1)I \Leftrightarrow \\ \tau R - I &\geq (\frac{p_H + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau} - \frac{\alpha p_H + (1 - \alpha)p_L + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\ \tau R &\geq -I(\frac{p_H + \tau - \alpha p_H - p_L + \alpha p_L - \tau}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\ \tau R - I &\geq (\frac{(1 - \alpha)p_H - p_L + \alpha p_L}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\ \tau R - I &\geq (\frac{(1 - \alpha)(p_H - p_L)}{\alpha p_H + (1 - \alpha)p_L + \tau})I \end{aligned} \quad (4)$$

This shows that the entrepreneur with a high-quality project will have an incentive to raise funds. Condition 4 represent a threshold for the net benefit $(\tau R - I)$ from the investment being worthwhile, considering the investor's mixed beliefs about the project quality.

(e)

To show under what condition an entrepreneur with a low-quality project will have an incentive to actually raise funds to make the investment, I will use the answer in question (c), and proceed in a similar way to part (d):

Similar to part (d) the entrepreneur's expected payoff must be greater or equal to the cash flow R times the probability of success with low-quality, p_L minus the the deepening investment costs I . This yields the following equation:

$$\begin{aligned}
p_L R + [\tau R - (\frac{p_L + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau})I] - I &\geq p_L R - I \Leftrightarrow \\
\tau R - I &\geq (\frac{p_L + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau} - 1)I \Leftrightarrow \\
\tau R - I &\geq (\frac{p_L + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau} - \frac{\alpha p_H + (1 - \alpha)p_L + \tau}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\
\tau R - I &\geq (\frac{p_L + \tau - \alpha p_H - (1 - \alpha)p_L - \tau}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\
\tau R - I &\geq (\frac{p_L - \alpha p_H - p_L + \alpha p_L}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\
\tau R - I &\geq (\frac{-\alpha p_H + \alpha p_L}{\alpha p_H + (1 - \alpha)p_L + \tau})I \Leftrightarrow \\
\tau R - I &\geq (\frac{(p_L - p_H)\alpha}{\alpha p_H + (1 - \alpha)p_L + \tau})I \tag{5}
\end{aligned}$$

Equation 5 shows the condition where the entrepreneur with a low-quality project will have an incentive to raise funds to make the investment.

(f)

The differences between the two conditions lie in the numerators of the fractions in the thresholds. Equation 4 uses $(1 - \alpha)(p_H - p_L)$, while equation 5 uses $(p_L - p_H)\alpha$. Since $p_H > p_L$, condition 5 is negative which implies that the conditions cannot be satisfied simultaneously. Therefore no pooling equilibrium exists.

In the context of a pooling equilibrium, it means that both high- and low-quality projects are treated similarly, leading to a single financing strategy for the entrepreneur for all projects regardless of their actual quality. For a pooling equilibrium to exist, both conditions must be satisfied for their respective project types. This implies that both high and low-quality projects must offer sufficient net benefits to justify the investment costs under the respective investor beliefs about the quality of the project.

Problem 3

Theoretical results from Levit

The paper conducted by Levit (2019) explores the dynamics of communications between investors and firms, focusing on the role of an activist investor in corporate governance. Similar to the case in the Disney article, the main premise is that activists cannot impose their ideas on companies; they must persuade the board of the benefits. The paper by Levit (2019) suggests that the threat of a public campaign ('voice') and the option to exit (sell shares) can facilitate effective communication under certain conditions. Effective communication depends on factors such as the credibility of the activist's threat to launch a campaign and the option to exit at favourable terms. The board must then choose between making an organisational change or retaining the status quo.

In the case of the Disney article, Nelson Peltz is the activist who is attempting to join Disney's board. Peltz must persuade other shareholders and the board that his ideas are beneficial. His public campaign is a form of 'voice', aiming to influence other shareholders and the board.

Levit's analysis can be utilised to shed light on Disney's response to Peltz's campaign. If Disney perceives Peltz's campaign as credible and potentially damaging, they might be more inclined to engage in dialogue or consider his suggestions seriously and make a change, which is allowing Peltz to join Disney's board of directors. However, if his campaign does not seem credible, the board may decide to maintain the status quo.

Another point made by Levit (2019) is that the option to exit (sell shares) can influence an activist's approach. However, in Peltz's case, his significant investment in Disney indicates a long-term interest rather than a short-term exit strategy. This aligns with Levit's view that the threat of exit is most effective when the shareholder has a significant stake, as it gives more weight to their voice.

In the theoretical framework, assume $p > \underline{\theta}$, where p is the share price and $\underline{\theta}$ is the payoff

from choosing the status quo. If the board chooses to keep, then the activists might exit. If the board chooses change, then the activists exit if and only if $\theta < p$, where θ is the payoff when making a change. Thus, if Peltz is certain that the payoff (θ) from any change is less than the share price (p), he should opt to remain silent as voicing concerns (m=voice) would be costlier compared to being silent (m=silent).

Focusing on the empirical predictions, Levit's model predicts that the success of shareholder activism depends on several factors, including the credibility of the activist's threats and the likelihood of exit. Peltz's success in his campaign will depend on his ability to present a credible threat to Disney's current management strategy and his perceived likelihood of exiting his position if his demands are not met.

Realistic model assumptions

Levit assumes that activists cannot force their ideas on companies but must persuade the board or other shareholders to make a change. This assumption is realistic in the Disney case, as Peltz cannot simply join the board and make changes. Peltz has to persuade the other shareholders and the board to make him a board member.

Furthermore, the model assumes information asymmetry, where the activist has information the board does not. This is somewhat realistic as it is reasonable to think that Peltz, as an experienced investor, might possess insights or perspectives that the Disney board lacks. However, Disney states that Peltz does not have experience in large-cap media or tech, and has no solutions to offer for the evolving media landscape. Therefore, the assumption about information asymmetry and that Peltz possesses some private information might be unrealistic in the Disney case. Additionally, this might suggest that Peltz does not seem credible, consequently lowering his probability of persuading Disney's shareholders.

Levit's model also assumes that there are costs associated with launching a public campaign. This is a realistic assumption, since it is most likely that Peltz incurs substantial financial costs such as significant investment in public relations, advocacy, and possibly legal consul-

tancy. Additionally, Levit's model acknowledges non-financial costs like reputational risk. An activist engaging in a public campaign risks damaging the board members' reputations, especially if the campaign succeeds and when directors have career concerns (e.g., young directors), (Levit, 2019). Hence, this reputational risk assumption also seems highly realistic in the case of Disney and with Peltz launching a campaign.

Lastly, Levit's model assumes that activist investors can utilise the threat of selling their shares (exiting) as a strategic tool to influence corporate decisions. This is highly relevant in the case of Disney since Peltz owns 9.4 million shares of Disney's stock. However, the size of his stake also means that exiting would involve selling a large volume of shares, which could be challenging without negatively impacting the share price and his investment return. Therefore, this assumption might not be realistic in the case of Disney, as a sudden exit could be detrimental to both Peltz and Disney. Hence, exiting might not be a practical option for Peltz, suggesting that his use of the exit threat is more strategic and symbolic than the immediate actionable plan assumed by (Levit, 2019).

References

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