Andreas Krause

Outline

Introduction

Optimal effort levels



Summary

Copyright 🔘 by Andreas Krause



Introduction

Optimal effort levels

Risk shifting

Summary

Copyright 🔘 by Andreas Krause



Optimal effort lev

Risk shifting

Managerial decisions on investments

Copyright 🔘 by Andreas Krause

Optimal effort lev 000000 Risk shifting

Managerial decisions on investments

Managers have a profound impact on the capital structure of a company

Copyright 🔘 by Andreas Krause



Managerial decisions on investments

- Managers have a profound impact on the capital structure of a company
- Managers will choose the amount of debt and equity that are best for them

Copyright 🔘 by Andreas Krause

Managerial decisions on investments

- Managers have a profound impact on the capital structure of a company
- Managers will choose the amount of debt and equity that are best for them
- This can lead to moral hazard as their decision might not be optimal for the company value

Managerial decisions on investments

- Managers have a profound impact on the capital structure of a company
- Managers will choose the amount of debt and equity that are best for them
- This can lead to moral hazard as their decision might not be optimal for the company value

Optimal effort le 000000

Risk shifting

Effort and investment choice

Copyright () by Andreas Krause Slide 5 of 17

Effort and investment choice

Managers can affect outcomes through their own actions

Copyright (C) by Andreas Krause Slide 5 of 17 Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours

Copyright () by Andreas Krause

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours or working more intensely during the day

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours or working more intensely during the day
- Managers also decide which investments are pursued

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours or working more intensely during the day
- Managers also decide which investments are pursued and these might not be in the best interest of shareholders or lenders

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours or working more intensely during the day
- Managers also decide which investments are pursued and these might not be in the best interest of shareholders or lenders
- ► The incentives of managers are affected by the capital structure

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours or working more intensely during the day
- Managers also decide which investments are pursued and these might not be in the best interest of shareholders or lenders
- The incentives of managers are affected by the capital structure and hence managers will make decisions that suit them

- Managers can affect outcomes through their own actions, especially by through the effort they make to generate profits to shareholders
- As effort is costly, managers will balance these costs against the benefits that accrue to them
- Effort costs might include the working of long hours or working more intensely during the day
- Managers also decide which investments are pursued and these might not be in the best interest of shareholders or lenders
- The incentives of managers are affected by the capital structure and hence managers will make decisions that suit them

Introduction

Optimal effort levels

Risk shifting

Summary

Copyright 🔘 by Andreas Krause



Optimal effort levels o●oooo	

Copyright 🕐 by Andreas Krause



Introduction 000	Optimal effort levels ○●○○○○	
Manager-owne	ed company	

► A company's manager can affect their success through his effort

Copyright (C) by Andreas Krause

Introduction 000	Optimal effort levels o●oooo	
Manager-own	ed company	

A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment

Introduction 000	Optimal effort levels o●oooo	
Manager-owne	ed company	

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- ► Effort is costly

	Optimal effort levels o●oooo	
Manager-owned	company	

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases

	Optimal effort levels ○●○○○○	
Manager-owne	d company	

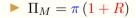
- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- ▶ The company generates a return on its investment



Copyright (C) by Andreas Krause

	Optimal effort levels ○●○○○○	
Manager-owned	company	

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful



	Optimal effort levels 0●0000	
Manager-owned	company	

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful, which depends on the effort level

$$\Pi_M = \pi \left(1 + R \right) \quad - \quad e$$

	Optimal effort levels ○●○○○○	
Manager-owned	company	

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful, which depends on the effort level
- If the company is fully financed by equity belonging to the manager, he will retain these profits
- $\square_M = \pi \left(1 + R \right) E e$

	Optimal effort levels ○●○○○○	
Manager-owned		

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful, which depends on the effort level
- If the company is fully financed by equity belonging to the manager, he will retain these profits and face the cost of effort
- $\square_M = \pi \left(1 + R \right) E ce$

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful, which depends on the effort level
- If the company is fully financed by equity belonging to the manager, he will retain these profits and face the cost of effort
- $\square \Pi_M = \pi \left(1 + R \right) E ce$
- The optimal effort level is given if $\frac{\partial \Pi_M}{\partial e} = 0$

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful, which depends on the effort level
- If the company is fully financed by equity belonging to the manager, he will retain these profits and face the cost of effort
- $\Pi_M = \pi \left(1 + R \right) E ce$
- The optimal effort level is given if $\frac{\partial \Pi_M}{\partial e} = 0$
- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{E}$

- A company's manager can affect their success through his effort, the higher the effort the higher the success rate of an investment
- Effort is costly and the marginal benefits are decreasing as the effort level increases
- The company generates a return on its investment if successful, which depends on the effort level
- If the company is fully financed by equity belonging to the manager, he will retain these profits and face the cost of effort
- $\Pi_M = \pi \left(1 + R \right) E ce$
- The optimal effort level is given if $\frac{\partial \Pi_M}{\partial e} = 0$
- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{E}$

Financing with debt

Copyright (C) by Andreas Krause

	Optimal effort levels oo●ooo	Summary 0000
Financing with debt		

Assume that managers do not hold sufficient equity to finance the company

	Optimal effort levels 00●000		
Financing with c	lebt		
Assume that	t managers do not hold suffici	ent equity to finance the cor	mpany and

Copyright (C) by Andreas Krause

use loans for the remainder

	Optimal effort levels 00●000		
Financing with debt			
Assume that ma	nagers do not hold suffic	ient equity to finance the com	npany and

use loans for the remainder: $E = \hat{E} + L$

	Optimal effort levels oo●ooo	
Financing with debt		

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again

$$\hat{\Pi}_M = \pi \left(1 + R \right) \left(\hat{E} + L \right) \qquad -ce$$

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again, but from these he has to repay the loan with interest

•
$$\hat{\Pi}_M = \pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L - ce$$

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again, but from these he has to repay the loan with interest

$$\hat{\Pi}_{M} = \pi \left(1 + R \right) \left(\hat{E} + L \right) - \left(1 + r_{L} \right) L - ce$$

• The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again, but from these he has to repay the loan with interest

$$\hat{\Pi}_{M} = \pi \left(1 + R \right) \left(\hat{E} + L \right) - \left(1 + r_{L} \right) L - ce$$

► The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$ ⇒ $\frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}+L}$

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again, but from these he has to repay the loan with interest

$$\hat{\Pi}_{M} = \pi \left(1 + R \right) \left(\hat{E} + L \right) - \left(1 + r_{L} \right) L - ce$$

- ▶ The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$
- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}+L}$
- As $E = \hat{E} + L$ the effort level is identical to the case where the manager finances the company fully

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again, but from these he has to repay the loan with interest

$$\hat{\Pi}_{M} = \pi \left(1 + R \right) \left(\hat{E} + L \right) - \left(1 + r_{L} \right) L - ce$$

- ▶ The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$
- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}+L}$
- As $E = \hat{E} + L$ the effort level is identical to the case where the manager finances the company fully
- Increasing the amount of debt increases effort levels if not increasing the manager's investment into the company

- Assume that managers do not hold sufficient equity to finance the company and use loans for the remainder: $E = \hat{E} + L$
- Any profits accrue to the manager again, but from these he has to repay the loan with interest

$$\hat{\Pi}_{M} = \pi \left(1 + R \right) \left(\hat{E} + L \right) - \left(1 + r_{L} \right) L - ce$$

- ▶ The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$
- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}+L}$
- As $E = \hat{E} + L$ the effort level is identical to the case where the manager finances the company fully
- Increasing the amount of debt increases effort levels if not increasing the manager's investment into the company

Optimal effort levels

Risk shifting

Financing with outside equity

Copyright 🔘 by Andreas Krause



Moral hazard in capital structure decisions

Optimal effort levels ०००●००	

Assume that managers do not hold sufficient equity to finance the company

	Optimal effort levels 000●00	
Financing with	outside equity	
Financing with	outside equity	

Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder

Introduction 000	Optimal effort levels 000●00	
Financing with	n outside equity	

Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again

•
$$\Pi_M^* = \pi (1+R) \left(\hat{E} + E^* \right) - ce$$

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$\ \ \, \mathbf{\Pi}_{M}^{*} = \pi \left(1 + R \right) \left(\hat{E} + E^{*} \right) \frac{\hat{E}}{\hat{E} + E^{*}} - c e$$

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$\Pi_M^* = \pi \left(1 + R \right) \left(\hat{E} + E^* \right) \frac{\hat{E}}{\hat{E} + E^*} - ce = \pi \left(1 + R \right) \hat{E} - ce$$

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$\Pi_M^* = \pi \left(1 + R \right) \left(\hat{E} + E^* \right) \frac{\hat{E}}{\hat{E} + E^*} - ce = \pi \left(1 + R \right) \hat{E} - ce$$

• The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$= \pi (1+R) \left(\hat{E} + E^* \right) \frac{\hat{E}}{\hat{E} + E^*} - ce = \pi (1+R) \hat{E} - ce$$

► The optimal effort level is given if $\frac{\partial \hat{\Pi}_M}{\partial e} = 0$ ⇒ $\frac{\partial \pi}{\partial e} = \frac{c}{1+B}\frac{1}{\hat{c}}$

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$\Pi_M^* = \pi \left(1 + R \right) \left(\hat{E} + E^* \right) \frac{\hat{E}}{\hat{E} + E^*} - ce = \pi \left(1 + R \right) \hat{E} - ce$$

• The optimal effort level is given if
$$\frac{\partial \hat{\Pi}_M}{\partial e} = 0$$

- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}}$
- ▶ As $\hat{E} < E$ the effort level is lower to the case where the manager finances the investment through debt

- Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$\Pi_M^* = \pi \left(1 + R \right) \left(\hat{E} + E^* \right) \frac{\hat{E}}{\hat{E} + E^*} - ce = \pi \left(1 + R \right) \hat{E} - ce$$

• The optimal effort level is given if
$$\frac{\partial \hat{\Pi}_M}{\partial e} = 0$$

- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}}$
- ▶ As $\hat{E} < E$ the effort level is lower to the case where the manager finances the investment through debt
- ▶ This arises from the decreasing marginal success rate as the effort increases

- ▶ Assume that managers do not hold sufficient equity to finance the company and use outside equity for the remainder: $E = \hat{E} + E^*$
- Any profits accrue to the manager again, but he can only obtain a fraction in proportion to his ownership of the company

$$\Pi_M^* = \pi \left(1 + R \right) \left(\hat{E} + E^* \right) \frac{\hat{E}}{\hat{E} + E^*} - ce = \pi \left(1 + R \right) \hat{E} - ce$$

• The optimal effort level is given if
$$\frac{\partial \hat{\Pi}_M}{\partial e} = 0$$

- $\Rightarrow \frac{\partial \pi}{\partial e} = \frac{c}{1+R} \frac{1}{\hat{E}}$
- ▶ As $\hat{E} < E$ the effort level is lower to the case where the manager finances the investment through debt
- > This arises from the decreasing marginal success rate as the effort increases

Sharing benefits of efforts with outside equity

Copyright 🔘 by Andreas Krause

Sharing benefits of efforts with outside equity

Financing the company through outside equity lowers effort levels

Copyright 🔘 by Andreas Krause

Sharing benefits of efforts with outside equity

Financing the company through outside equity lowers effort levels as the manager has to share the benefits of his effort with outside equity holders

Sharing benefits of efforts with outside equity

- Financing the company through outside equity lowers effort levels as the manager has to share the benefits of his effort with outside equity holders
- With debt financing, any surplus arising from increasing effort is retained by the manager as debt repayments are fixed

Sharing benefits of efforts with outside equity

- Financing the company through outside equity lowers effort levels as the manager has to share the benefits of his effort with outside equity holders
- With debt financing, any surplus arising from increasing effort is retained by the manager as debt repayments are fixed
- ► The higher benefits arising from increased effort will be balanced against its costs

Sharing benefits of efforts with outside equity

- Financing the company through outside equity lowers effort levels as the manager has to share the benefits of his effort with outside equity holders
- With debt financing, any surplus arising from increasing effort is retained by the manager as debt repayments are fixed
- ▶ The higher benefits arising from increased effort will be balanced against its costs

Optimal effort levels ooooo●	Summary 0000

Attracting funding

Copyright (C) by Andreas Krause

	Optimal effort levels 00000●	
Attracting funding		

Outside equity needs to be attracted at the optimal effort level of the managers

	Optimal effort levels ooooo●	Summary 0000
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\pi^* (1+R) E^* \ge (1+r_E) E^*$

	Optimal effort levels 00000●	
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\pi^* (1+R) E^* \ge (1+r_E) E^*$
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$



- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$
- Loans will only be given if they can be repaid at the optimal effort level of the manager

•
$$\pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L \ge 0$$

	Optimal effort levels 00000●	Summary 0000
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$
- Loans will only be given if they can be repaid at the optimal effort level of the manager

$$\pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L \ge 0$$
$$\Rightarrow \pi^{**} (1+R) \ge (1+r_L) \frac{L}{\hat{E}+L}$$

	Optimal effort levels 00000●	
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$
- Loans will only be given if they can be repaid at the optimal effort level of the manager

•
$$\pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L \ge 0$$

- $\Rightarrow \pi^{**} (1+R) \ge (1+r_L) \frac{L}{\hat{E}+L}$
- ▶ The effort when raising debt is higher

	Optimal effort levels 00000●	Summary 0000
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$
- Loans will only be given if they can be repaid at the optimal effort level of the manager

•
$$\pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L \ge 0$$

- $\Rightarrow \pi^{**} (1+R) \ge (1+r_L) \frac{L}{\hat{E}+L}$
- ▶ The effort when raising debt is higher, $\pi^{**} > \pi^*$

	Optimal effort levels 00000●	Summary 0000
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$
- Loans will only be given if they can be repaid at the optimal effort level of the manager

•
$$\pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L \ge 0$$

- $\Rightarrow \pi^{**} (1+R) \ge (1+r_L) \frac{L}{\hat{E}+L}$
- ▶ The effort when raising debt is higher, $\pi^{**} > \pi^*$, and as loan costs are lower than equity costs, it is easier to attract debt than equity

	Optimal effort levels 00000●	Summary 0000
Attracting funding		

- Outside equity needs to be attracted at the optimal effort level of the managers and return at least its costs
- $\Rightarrow \pi^* \left(1 + R \right) \ge 1 + r_E$
- Loans will only be given if they can be repaid at the optimal effort level of the manager

•
$$\pi (1+R) \left(\hat{E} + L \right) - (1+r_L) L \ge 0$$

- $\Rightarrow \pi^{**} (1+R) \ge (1+r_L) \frac{L}{\hat{E}+L}$
- ▶ The effort when raising debt is higher, $\pi^{**} > \pi^*$, and as loan costs are lower than equity costs, it is easier to attract debt than equity

	Risk shifting ●00	

Introduction

Optimal effort levels





Copyright (C) by Andreas Krause

Moral hazard in capital structure decisions

	Risk shifting o●o	

Copyright 🕐 by Andreas Krause

Slide 13 of 17

Moral hazard in capital structure decisions

	Risk shifting 0●0	



- Suppose a company can choose between two investments
- One investment has a low risk and a low return if successful

$$\blacktriangleright \ \Pi^i_C = \pi_i \left((1+R_i) \right)$$

Copyright 🔘 by Andreas Krause

- Suppose a company can choose between two investments
- One investment has a low risk and a low return if successful, while the other has a high risk and a high return if successful

 $\blacktriangleright \Pi^i_C = \pi_i \left((1 + R_i) \right)$

- Suppose a company can choose between two investments
- One investment has a low risk and a low return if successful, while the other has a high risk and a high return if successful
- The company uses debt and equity to finance the investment
- $\Pi_C^i = \pi_i \left((1 + R_i) \left(E + L \right) (1 + r_L) L \right)$

- Suppose a company can choose between two investments
- One investment has a low risk and a low return if successful, while the other has a high risk and a high return if successful
- The company uses debt and equity to finance the investment

$$\Pi_C^i = \pi_i \left((1 + R_i) \left(E + L \right) - (1 + r_L) L \right)$$

	Risk shifting 00●	

Companies increasing risks

Copyright () by Andreas Krause Slide 14 of 17

Moral hazard in capital structure decisions

Introduction 000		Risk shifting ○○●	
Companies increasing	risks		

Introduction	Optimal effort levels	Risk shifting	Summary
000	000000	00●	0000
Companies incre	asing risks		

- Companies will choose the low-risk investment if $\Pi_C^H \ge \Pi_C^L$ $\Rightarrow \frac{L}{E} \leq \frac{\pi_H(1+R_H) - \pi_L(1+R_L)}{\pi_L(R_L-r_L) - \pi_H(R_H-r_L)}$

Introduction 000		Risk shifting 00●	
Companies incr	reasing risks		

- \blacktriangleright Companies will choose the low-risk investment if $\Pi_C^H \ge \Pi_C^L$
- $\Rightarrow \frac{L}{E} \leq \frac{\pi_H(1+R_H) \pi_L(1+R_L)}{\pi_L(R_L r_L) \pi_H(R_H r_L)}$
- ▶ If the leverage is sufficiently low, companies will seek the low-risk investment

Introduction 000		Risk shifting 00●	
Companies increasing	risks		

- ▶ If the leverage is sufficiently low, companies will seek the low-risk investment
- Higher leverage will induce companies to take the more risky investment

Introduction 000		Risk shifting 00●	
Companies increasing	risks		

- ▶ If the leverage is sufficiently low, companies will seek the low-risk investment
- Higher leverage will induce companies to take the more risky investment
- This is known as the risk shifting property of debt

		Risk shifting oo●	
Companies increasing	risks		

- ▶ If the leverage is sufficiently low, companies will seek the low-risk investment
- Higher leverage will induce companies to take the more risky investment
- This is known as the risk shifting property of debt
- Lenders may seek to limit the amount of lending such that the company does not choose the high-risk investment

Introduction 000		Risk shifting ○○●	
Companies increasi	ing risks		

- ▶ If the leverage is sufficiently low, companies will seek the low-risk investment
- Higher leverage will induce companies to take the more risky investment
- This is known as the risk shifting property of debt
- Lenders may seek to limit the amount of lending such that the company does not choose the high-risk investment

Introduction

Optimal effort levels

Risk shifting



Copyright (C) by Andreas Krause

Moral hazard in capital structure decisions

Optimal effort le 000000

Risk shifting

Debt increases efforts and risks

Copyright (C) by Andreas Krause

Optimal effort le 000000 Risk shifting

Debt increases efforts and risks



Copyright 🔘 by Andreas Krause

Risk shifting

Debt increases efforts and risks

 Using debt to finance investment increases effort levels, making companies more valuable



Risk shifting

Debt increases efforts and risks

- Using debt to finance investment increases effort levels, making companies more valuable
- Debt is easier to attract than outside equity

Copyright 🔘 by Andreas Krause

- Using debt to finance investment increases effort levels, making companies more valuable
- Debt is easier to attract than outside equity
- Higher debt levels also provide managers with incentives to increase risks

- Using debt to finance investment increases effort levels, making companies more valuable
- Debt is easier to attract than outside equity
- ▶ Higher debt levels also provide managers with incentives to increase risks
- This might make debt unattractive to lenders

- Using debt to finance investment increases effort levels, making companies more valuable
- Debt is easier to attract than outside equity
- ▶ Higher debt levels also provide managers with incentives to increase risks
- This might make debt unattractive to lenders and the company has to finance itself through outside equity

- Using debt to finance investment increases effort levels, making companies more valuable
- Debt is easier to attract than outside equity
- ▶ Higher debt levels also provide managers with incentives to increase risks
- This might make debt unattractive to lenders and the company has to finance itself through outside equity

Risk shifting

Optimal capital structure

Copyright 🔘 by Andreas Krause

The optimal capital structure would balance the increased risks arising from debt with the increased effort

- The optimal capital structure would balance the increased risks arising from debt with the increased effort
- The optimal leverage would be where the overall value of the company to the manager is highest



- The optimal capital structure would balance the increased risks arising from debt with the increased effort
- The optimal leverage would be where the overall value of the company to the manager is highest
- As the manager bears the costs of effort, this leverage will not necessarily be maximizing company value

- The optimal capital structure would balance the increased risks arising from debt with the increased effort
- The optimal leverage would be where the overall value of the company to the manager is highest
- As the manager bears the costs of effort, this leverage will not necessarily be maximizing company value



Copyright ⓒ by Andreas Krause

Picture credits:

Cover: Prenier regard, Public domain, via Wikimedia Common, Hittp://common.wikimedia.org/wiki/File:DALLE_r-Faracital_markst.2[].jpg Back: Rhododnetins, CC BY SA & Dhtp://craitecommon.org/Ricenses/by-1a/0. via Wikimedia Common, http://uplada/Wikimedia/commons/0/04/Manhattan_ataight.aouth.of.Rockefeller.Center.panorama.[1205]p].jp

Andreas Krause Department of Economics University of Bath Claverton Down Bath BA2 7AY United Kingdom

E-mail: mnsak@bath.ac.uk