

# Corporate Finance Theory

## Lecture 11

## *Flip Side of Financial Synergies (2)*
## *Banal-Estanol et al.* (2013)

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# Intended outcomes for the day:

1. **To mathematically** analyze the comparative statics (empirical predictions) presented in the article

2. **To evaluate** whether the article successfully motivates the relevance of its central idea, that joint financing can generate risk-contamination losses

3. **To relate and apply** the theoretical ideas to the merger of American Airlines and US Airways

# Recap from last time

**Bankruptcy costs** can reduce an entrepreneur's payoff

Direct effect: loss in project value passed on from creditors, who demand a higher gross return (lower price of debt)

Indirect effect: higher gross return increases probability of bankruptcy, reducing project value further still

**Reduce severity of this problem**: separate financing or joint financing

Joint financing: coinsurance gains or risk-contamination losses. Depends whether project that succeeds lifts up, or is dragged down by, project that fails.

Chosing financing regime with lowest gross interest rate is not always optimal

# Comparative Statics

Recall that 1 - gamma of the cash flow is lost (dead-weight loss) in case of default.

*"Prediction 1 (Default costs). For higher default costs (lower γ ), (i) both joint and separate financing can be obtained for a smaller region of parameters and (ii) joint financing is optimal for a smaller region of the remaining parameters."*

**What exactly does this mean?** For parameter values ($r_H$, $r_L$, p, *γ):*

- -If separate financing is infeasible, it will remain infeasible after decrease in γ
- -If separate financing is feasible, it may become infeasible after decrease in γ
- -If joint financing with coinsurance is infeasible, it will remain infeasible after decrease in γ
- -If joint financing with coinsurance is feasible, it may become infeasible after decrease in γ

Hence, after a decrease in γ, the entrepreneur

-May switch from separate financing to no financing

-May switch from joint financing to no financing

-May switch from joint financing to separate financing

if only sep. financing feasible, not joint with coinsurance, was feasible.

→ if only joint fin. with coinsur. was feasible before.

# Comparative Statics

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-If joint financing with coinsurance is feasible, it may become infeasible after decrease in γ

separate 'joint, coinsurance.

In other words, a decrease in γ **makes the conditions** $r^* < r_H$ and $r_m^* < (r_H + r_L)/2$ **harder to satisfy**.

see inequalities in lecture Slides 10

# Comparative Statics

Last slide ignores joint financing with risk-contamination

Condition for joint financing with contamination: $\mathbf{r_m^{**} < r_H}$, or

$$p^2 r_H + p(1-p)\,\gamma\,(r_H + r_L) + (1-p)^2\,\gamma\, r_L \geq 1$$

Condition for separate financing: $\mathbf{r^* < r_H}$, or

$$p\, r_H + (1-p)\,\gamma\, r_L \geq 1$$

most popular answer.

**Question**: which of these two conditions is **easiest to satisfy**?

(a) $r_m^{**} < r_H$ is always easiest to satisfy

(b) $r_m^{**} < r_H$ is easiest to satisfy when γ is small, but not when γ is large

(c) $r^* < r_H$ is always easiest to satisfy

(d) $r^* < r_H$ is easiest to satisfy when γ is small, but not when γ is large

Take 5 minutes. Then go to socrative.com, room 897458, and vote for what you think is the best answer.
Hint: you can use different strategies. One is to work directly with the equations and show one left-hand side is larger/smaller than the other. Another is to consider a special case (say gamme = 1 or = 0). Yet another is to think about what the two left-hand sides represent, in terms of economics.

# Comparative Statics

Take $\gamma = 0$

Blue LHS : $p^2 r_H$

Red LHS : $p r_H > p^2 r_H$.

Last slide ignores joint financing with risk-contamination

Condition for joint financing with contamination: $\mathbf{r_m^{**} < r_H}$ , or

$$p^2 r_H + p(1-p)\,\gamma\,(r_H + r_L) + (1-p)^2\,\gamma\,r_L \geq 1$$

Expected cash flow pr project, taking into account expected default costs

Condition for separate financing: $\mathbf{r^* < r_H}$ , or

$$p\,r_H + (1-p)\,\gamma\,r_L \geq 1$$

Expected cash flow per project taking into account expected default costs

**Question**: which of these two conditions is **easiest to satisfy**?

(a) $r_m^{**} < r_H$ is always easiest to satisfy

(b) $r_m^{**} < r_H$ is easiest to satisfy when γ is small, but not when γ is large

(c) $r^* < r_H$ is always easiest to satisfy

(d) $r^* < r_H$ is easiest to satisfy when γ is small, but not when γ is large

# Discussion

Condition for joint financing with contamination: $\mathbf{r_m^{**} < r_H}$ , or

$$\mathbf{p^2 r_H + p(1-p)\,\gamma\,(r_H + r_L) + (1-p)^2\,\gamma\,r_L - 1 \geq 0}$$

Condition for separate financing: $\mathbf{r^* < r_H}$ , or

$$\mathbf{p\,r_H + (1-p)\,\gamma\,r_L - 1 \geq 0}$$

The LHS of the colored expressions is the NPV per project, taking into account expected bankruptcy costs under joint financing with risk-contamination and separate financing respectively.

Expected bankruptcy costs are highest under contamination, so $\mathbf{r^* < r_H}$, is easiest to satisfy. We can forget about joint financing with contamination!

**The entrepreneur never chooses joint financing with contamination. Whenever it is feasible, separate financing is feasible as well!**

# Comparative Statics

The relevant constraints are $\mathbf{r^* < r_H}$ (separate),

$$\mathbf{p\, r_H + (1-p)\, \gamma\, r_L - 1 \geq 0}$$

and $\mathbf{r_m^* < (r_H + r_L)/2}$ (joint, coinsurance)

$$\mathbf{(1-(1-p)^2)\,(r_H + r_L)\,/2 + (1-p)^2\, \gamma\, r_L - 1 \geq 0}$$

"***Prediction 1 (Default costs).*** *For higher default costs (lower γ ), (i) both joint and separate financing can be obtained for a smaller region of parameters and (ii) joint financing is optimal for a smaller region of the remaining parameters."*

This means that a decrease in *γ* will decrease the left-hand-sides of both inequalities

# Comparative Statics

The relevant constraints are $\mathbf{r^* < r_H}$ (separate),

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$$(1-(1-p)^2)\, (r_H + r_L)\, /2 + (1-p)^2\, \gamma\, r_L - 1 \geq 0$$

"***Prediction 2 (Mean).*** *For higher probability of a high return (higher p), (i) both joint and separate financing can be obtained for a larger region of parameters and (ii) joint financing is optimal for a larger region of the remaining parameters."*

This means that an increase in p will increase the left-hand-sides of both inequalities

# Comparative Statics

$$r_H = \frac{1 - (1-p)\gamma r_L}{p}$$

The relevant constraints are $\mathbf{r^* < r_H}$ (separate),

$$p\, r_H + (1-p)\, \gamma\, r_L - 1 \geq 0$$

and $\mathbf{r_m^* < (r_H + r_L)/2}$ (joint, coinsurance)

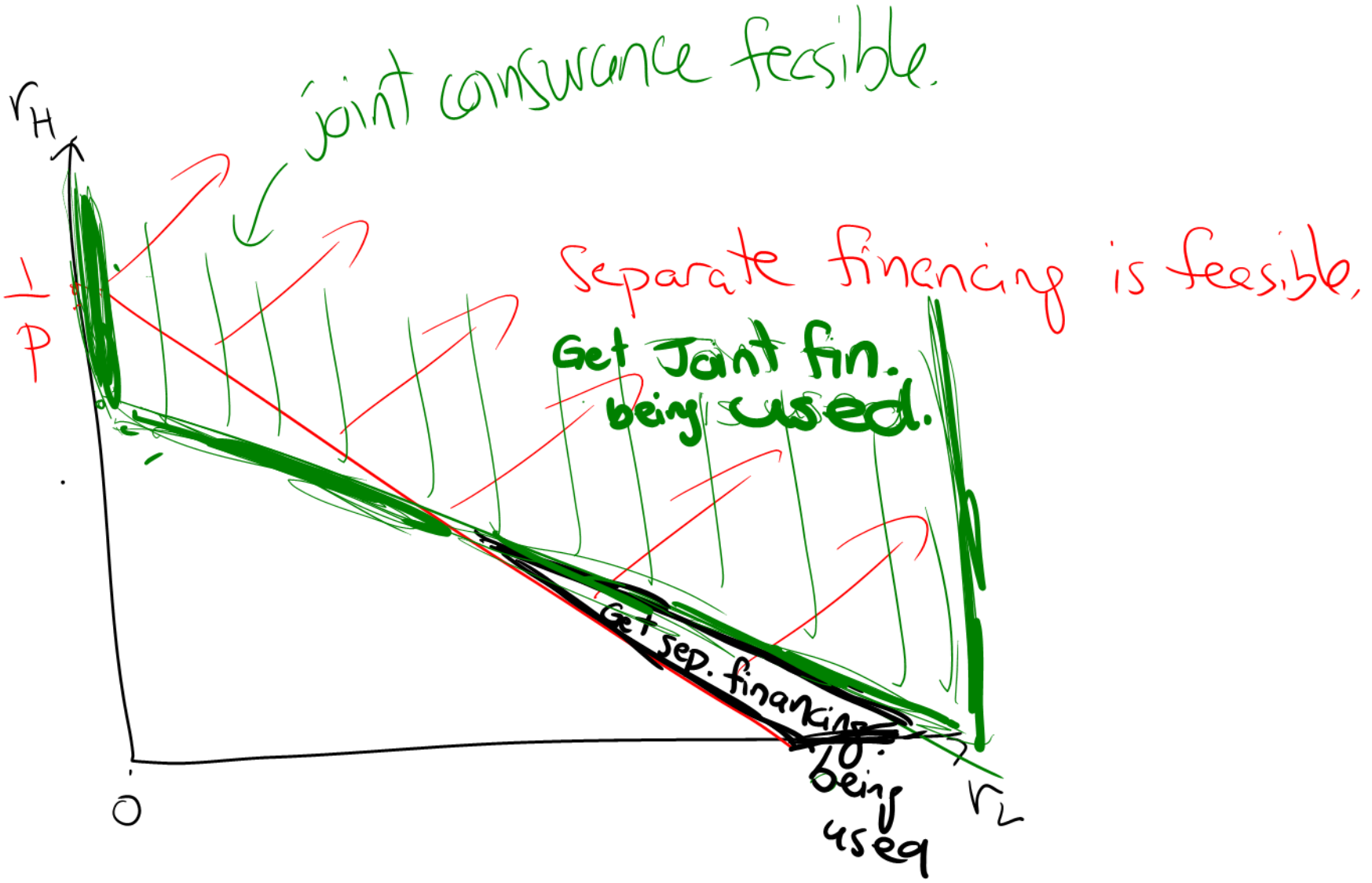
$$(1-(1-p)^2)\,(r_H + r_L)\,/2 + (1-p)^2\, \gamma\, r_L - 1 \geq 0$$

The left-hand-sides of both inequalities are linear in $r_H$ and $r_L$.

For fixed p and γ, each inequality can be plotted as a region of $(r_H, r_L)$ space.

In each case, it is the region above and to the right of a straight line which is defined by the above constraint holding with equality.

A drop in p or γ will shift both lines up and to the right


joint consurance fesible.
Separate financing is feasible,
Get Jant fin. being used.
Get sep. financing to being used
$r_H$
$\frac{1}{P}$
O
$r_L$

# Question: Motivating examples, empirical support

Last time, I asked you:

*Banal Estanol et al. emphasize how joint financing can generate risk-contamination losses ("contrary to popular wisdom"). Yet they only mention one motivating example for possible risk-contamination, that of UBS, on p.2. Is this a weakness of the paper? Why or why not? Be ready to share your ideas next time.*

More generally, should we conclude that the theoretical ideas in the paper lack empirical support?

**Discuss in groups. Nominate one person in your room to speak on your behalf.**

# Discussion

*Banal et al. emphasize how joint financing can generate risk-contamination losses ("contrary to popular wisdom"). Yet they only mention one motivating example for possible risk-contamination, that of UBS, on p.2. Is this a weakness of the paper? Why or why not? Should we conclude from this that the theoretical ideas in the paper lack empirical support?*

"The losses in the investment banking unit have prompted clients to withdraw cash from UBS's core wealth management business"

-Not a weakness: article presents many **empirical predictions** as to when mergers should or should not occur, based on their economic mechanism

-Weakness: the lack of motivating examples makes it **difficult to evaluate** whether their economic mechanism is "really what's going on"

-For their baseline analysis, in situations where joint financing would yield risk contamination, the entrepreneur will choose separate financing. Not clear **how much risk contamination we are likely to observe** in practice!

# Question: Application to a case

Last time, I asked you:

*Read the two Bloomberg articles posted in the folder for Lecture 11, regarding the recent merger between American Airlines and US Airways. In your view, what are the likely reasons for this merger? Are any of them related to the ideas in Banal-Estanol et al.? Be ready to share your ideas next time.*

**Discuss in groups. Then go to socrative.com, room 897458, and write a short answer.**

# Discussion

Last time, I asked you:

*Read the two Bloomberg articles posted in the folder for Lecture 11, regarding the recent merger between American Airlines and US Airways. In your view, what are the likely reasons for this merger? Are any of them related to the ideas in Banal-Estanol et al.? Be ready to share your ideas next time.*

-Partly motivated by **reducing bankruptcy costs**: "500,000 in bankruptcy-related professional fees alone every day that the bankruptcy continues"

-Difference: immediate goal is not to avoid bankrutpcy, but to quickly **emerge from bankruptcy**

-Alternative motivation: **reducing competition**, concerns of Justice Depart

-Alternative motivation: **economies of scale**, become large player in the global market, in principle might also relate to future solvency

# Intended outcomes revisited

1**. To mathematically** analyze the comparative statics (empirical predictions) presented in the article

Relevant constraints are for separate financing and joint financing with coinsurance. Can be represented mathematically but also graphically.

**3. To evaluate** whether the article successfully motivates the relevance of its central idea, that joint financing can generate risk-contamination losses.

More motivating examples would be better; but theory suggests risk contamination may rarely occur, and the article has many empirical predictions.

**4. To relate and apply** the theoretical ideas to the recent merger of American Airlines and US Airways

Bankrutpcy costs matter; but likely so do economics of scale, competition

# For next time

We will take a first look at *Bayar and Chemmanur* (2011), which considers *IPOs versus acquisitions.*

Focus on the first part of the paper: up to and including Proposition 1, and the discussion that follows.

Pay particular attention to the mixed strategy equilibrium described in this proposition.

Think about the following: which model assumptions are most important in deriving this particular equilibrium?