

**Investors and managers demonstrates risk aversion in different ways**



**People try to avoid risk**





**Why managers invest in risky projects?**



## RISK PREMIUM

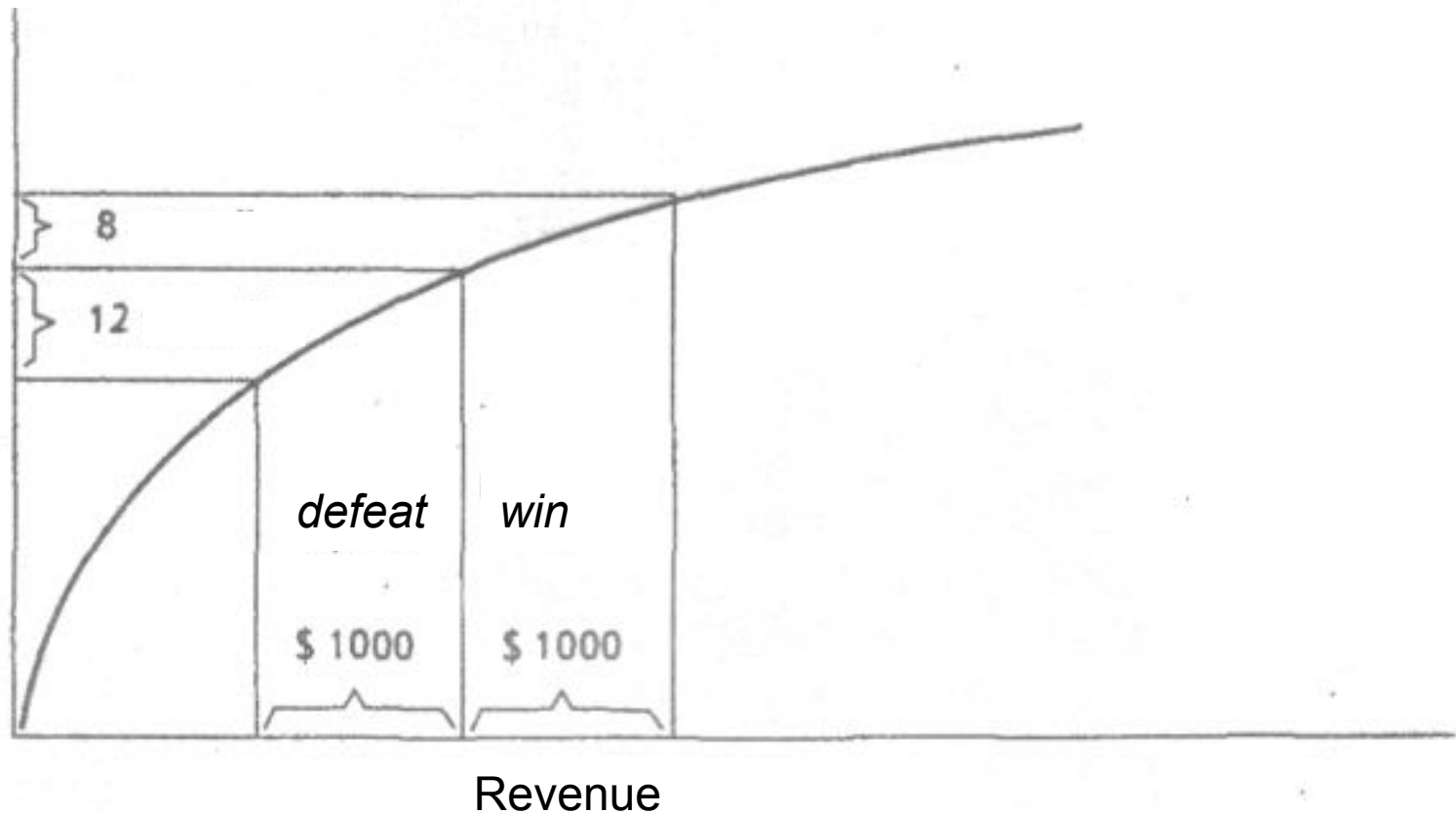
**I want to have a compensation not only for the use of my money, but for the risk to remain without them!**



*... a higher rate of profit, if there is a risk...*

Utility

win – 1000\$, defeat – 1000\$

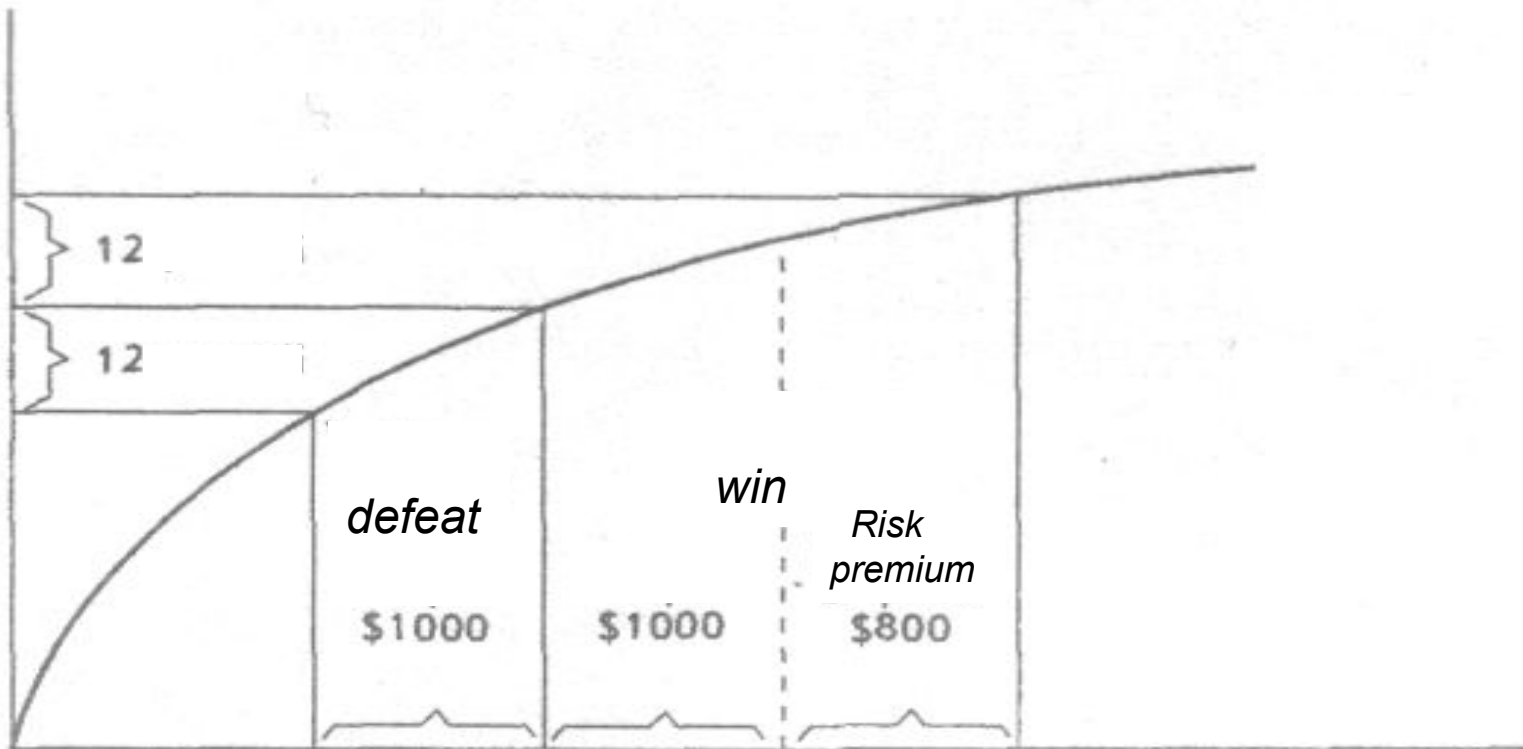


Negative expected value => investor will not bet

***Utility of revenue***

Utility

win – 1800\$, defeat – 1000\$



Revenue

**Utility of revenue**



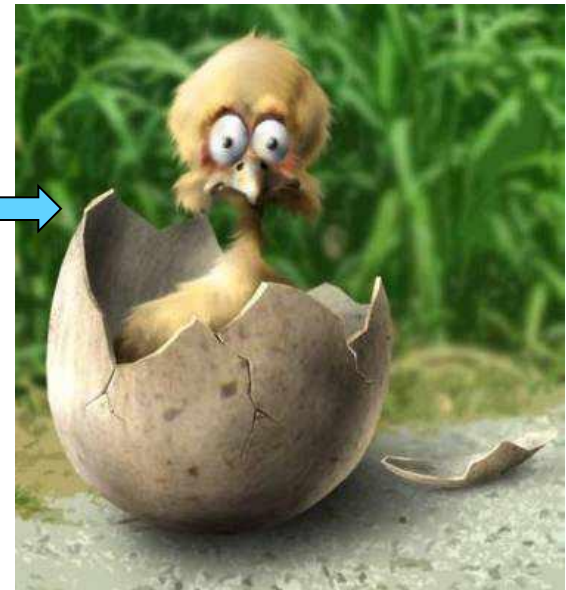
**Business risk associated with a firm decision about investment**

**Business risk is always there - no business does not guarantee success**

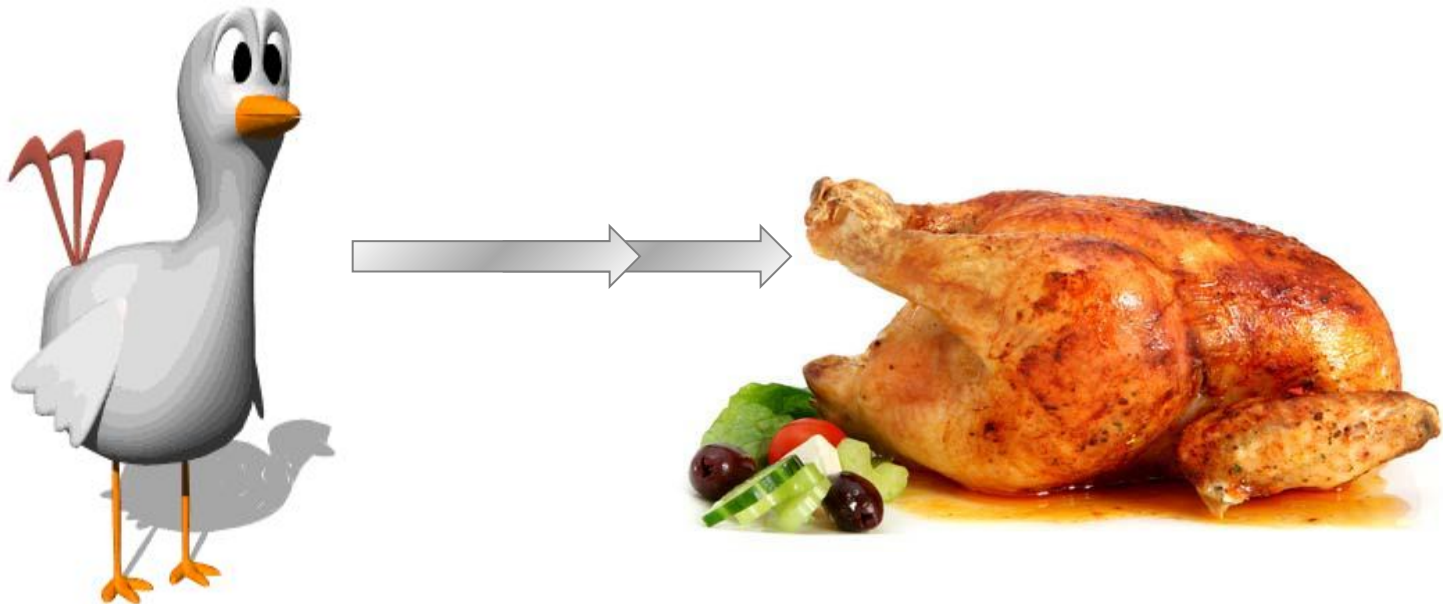



"We've considered every potential risk except the risks of avoiding all risks."

**Within one business direction, the investor usually faced with higher business risk in the newly created company**



**On the other hand, the "old" company, products or methods of entrepreneurship which are outdated, can have high enough degree of business risk**

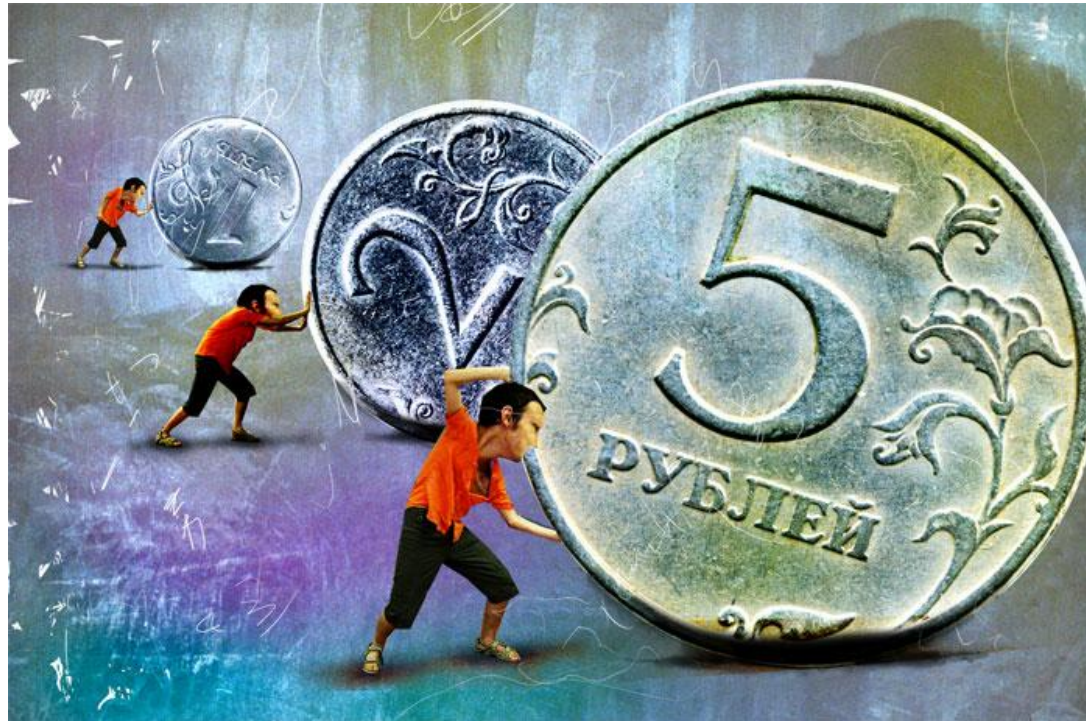




**Financial risk is determined by the financial decisions of the firm (the risk of possible insolvency)**



**The income of the company must first of all go to debt service**



## Adjustment of risk



# Discounted value of future profit

15

## Degree of risk

### Valuation model:

The diagram illustrates the NPV valuation model with the following equation and annotations:

$$\text{NPV}_I = \sum_{t=1}^n \frac{R_t}{(1+r)^t} - I_o$$

Annotations:

- The number of periods*: Points to the variable  $n$  in the summation.
- Estimated profit*: Points to the variable  $R_t$  in the numerator of the summation.
- The present value of the cash flow associated with investments*: Points to the entire summation term  $\sum_{t=1}^n \frac{R_t}{(1+r)^t}$ .
- The required rate of profit, taking into account the level of business and financial risk*: Points to the variable  $r$  in the denominator of the summation.
- The amount of initial investment*: Points to the variable  $I_o$ .

**Methods of risk account :**

✓ ***The rate method, corrected for risk***

✓ ***Method of certainty equivalent***



## ✓ The rate method, corrected for risk

### *The rate, corrected for risk*

-the required rate of profit from prospective investments after due consideration of the existing risk

**Ex:**



✓ **Method of certainty equivalent**

The diagram illustrates the Method of Certainty Equivalent for NPV calculation. It features the following equation and annotations:

$$NPV_I = \sum_{t=1}^n \frac{\alpha_t R_t}{(1+i)^t} - I_o = \sum_{t=1}^n \frac{R_t^*}{(1+i)^t}$$

Annotations and their corresponding parts in the equation:

- The number of periods**: Points to the upper limit  $n$  of the summation.
- The coefficient of certainty equivalent for period  $t$** : Points to  $\alpha_t$ .
- The expected cash flow in the period  $t$  at risk**: Points to  $R_t$ .
- Free from the risk equivalent amount of cash in the period  $t$** : Points to  $R_t^*$ .
- The present value of the cash flow associated with investments**: Points to the entire first summation term  $\sum_{t=1}^n \frac{\alpha_t R_t}{(1+i)^t}$ .
- Risk-free rate of profit or the interest rate for calculating the value of money**: Points to  $i$  in the denominator  $(1+i)^t$ .
- The amount of initial investment**: Points to  $I_o$ .

The coefficient of certainty equivalent  $\alpha$  is a number between 0 and 1, which reflects the function of risk of the decision maker.

Ex:

$$\alpha_t = \frac{\text{Free from the risk equivalent amount of cash in the period } t}{\text{The expected cash flow in the period } t \text{ at risk}}$$

*It varies inversely with the degree of risk  
(the higher the risk, the lower should be the factor)*

$\alpha = 1$  –the project is risk free

$\alpha = 0$  – the project is too risky  
to expect profit



Risk is anyway evaluated by one Manager or team of experts

And most often for any specific period:

$$\frac{\alpha_t R_t}{(1+i)^t} = \frac{R_t}{(1+r)^t}$$

$$\alpha_t = \frac{(1+i)^t}{(1+r)^t}$$



# *East-West Trading Company*

