



# Profitability Assessment in Fisheries and Fish Farming

Joint FAO & UNU/FTP Project

---

Goal: To build up knowledge to so that participants will be able to assess if a given project in the field of fisheries or fish farming will be profitable, i.e. economically sustainable, or not



# Possible courses to be offered by UNU-FTP in the beginning

---

- A. Profitability Assessment
- B. Financing and Marketing
- C. Operations Management
- D. Quality Mangement
- E. Fisheries Management
- F. Data Collection for Fisheries Management



# A. Profitability Assessment

## **Fisheries and Fish Farming Worldwide** **The Supply Chain in Fisheries**

- Profitability Measures
- Investment Analysis
- Operations Planning
- Business Plans
- Balance Sheet
- Cash Flow Analysis
- Sensitivity Analysis



# B. Financing and Marketing

---

- Company Management and Strategy
- Accounting and Financial Statements
- Financial Management
- World Seafood Markets
- Marketing of Seafood Products
- Human Resources
- Natural Resources



# C. Operations Management

---

- Operations Management Fundamentals
- Strategic Planning
- Production Plans
- Inventory Control
- Information Technology
- Introduction to Quality Management
- Project Management



## D. Quality Management

---

- Biochemical composition and quality of fishery raw materials
- Handling, holding and transportation of Fishery Raw Materials
- Food Safety and Hygiene in Seafood processing
- Processing technology of some fishery products
- Quality Assessment of Fresh and Frozen Fishery Products



# E. Fisheries Management

---

- Fisheries and Economic Development
- Introduction to Bioeconomics
- The Problem of Overfishing (why is it so difficult to leave enough fish in the water...)
- Stock Assessment and Monitoring
- Main Fisheries Management Schemes (Open vs Limited access: Licences, TAC, IQ, ITQ, ...)
- The Importance of User Rights and Incentives
- Fisheries Management Successes and Failures



# F. Data Collection for Fisheries Management

---

- Collection of fisheries data
- Automation of data collection
- Catch records
- Catch data bases
- Application in Fisheries Management
- Data for stock assessment
- Catch forecasting systems



# A. Profitability Assessment

## Background and Motivation

---

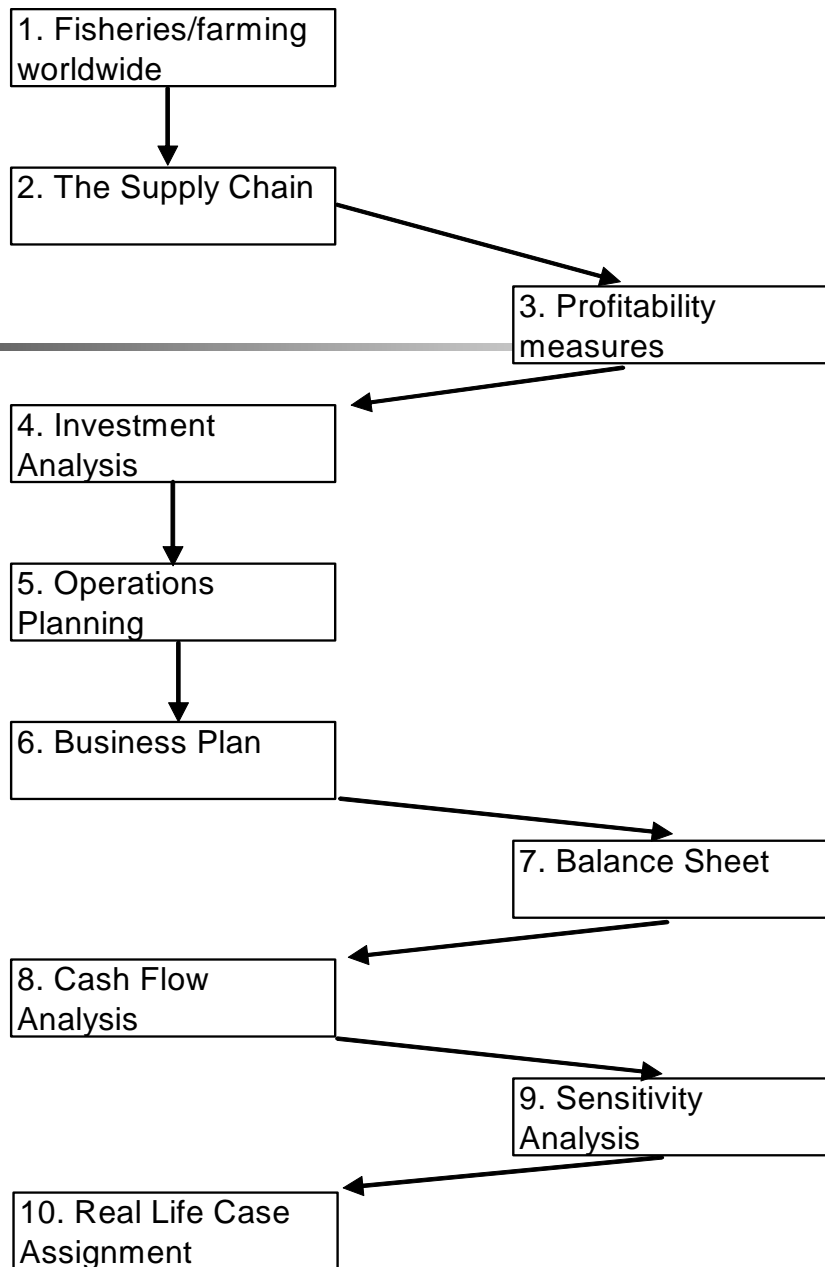
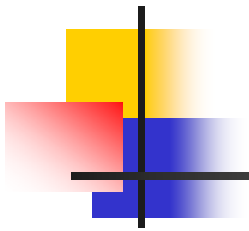
- New policy with emphasis on capacity building and education
- UNU/FTP expanding by offering a modular collection of flexible short courses to be held in the countries
- Nothing will be sustainable in the long run unless it is profitable
- Fisheries and Fish Farming should be operated as a business



# Course Overview

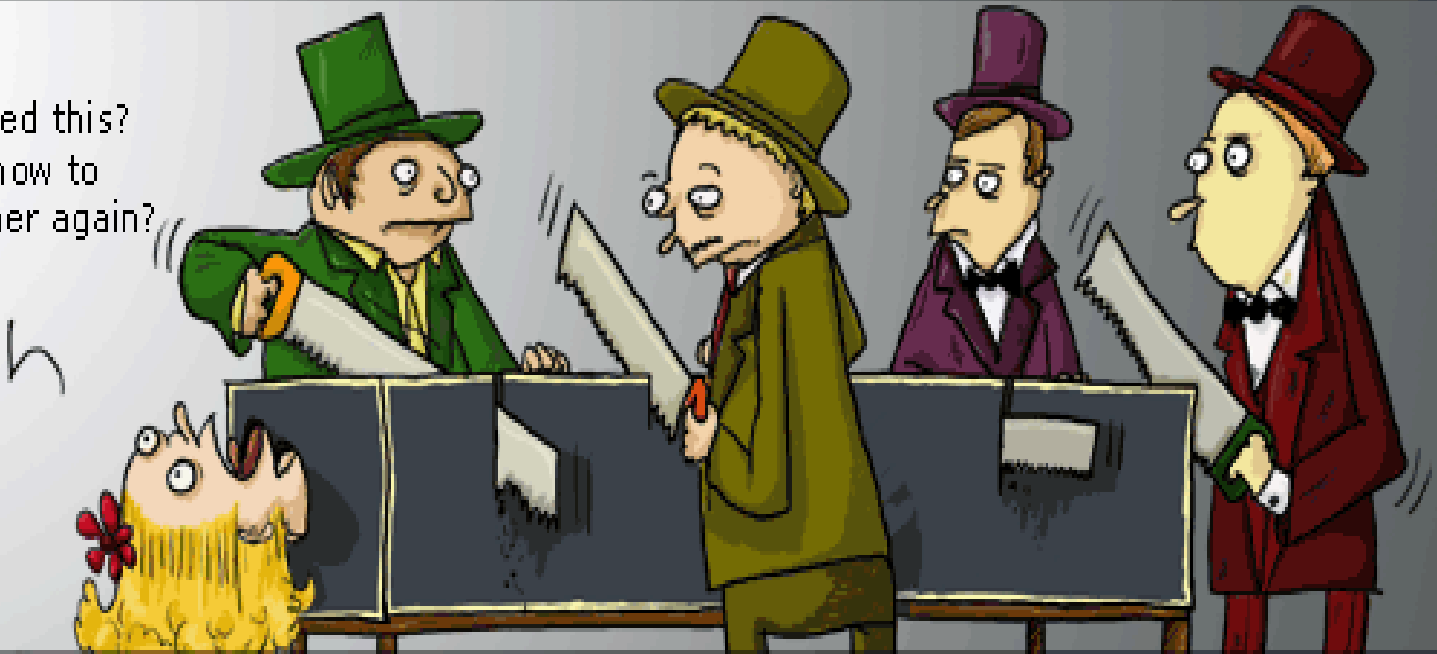
---

- Fisheries & Fish Farming worldwide
- Supply Chain in Fisheries
- Profitability Theory and Measures
- Investment Analysis
- Operations Planning
- Business Plan
- Balance Sheet and Financial Ratios
- Cash Flow and Profitability
- Sensitivity Analysis
- Real Life Case Assignment



# Plan before act!

Have you coordinated this?  
Have you planned how to  
put me back together again?



The four poor magicians each chipped in to share one woman



# 1. Fisheries & Fish Farming worldwide, objectives

---

- To give the participants an overview over the fisheries and fish farming industries in the world, including economic successes and failures, so that they understand better how the running of companies as businesses is the cornerstone of economic sustainability, while unprofitable industries will not sustain in the long run. Also, two case studies are introduced, one in fisheries and one in fish farming.

# Try to see the big picture!



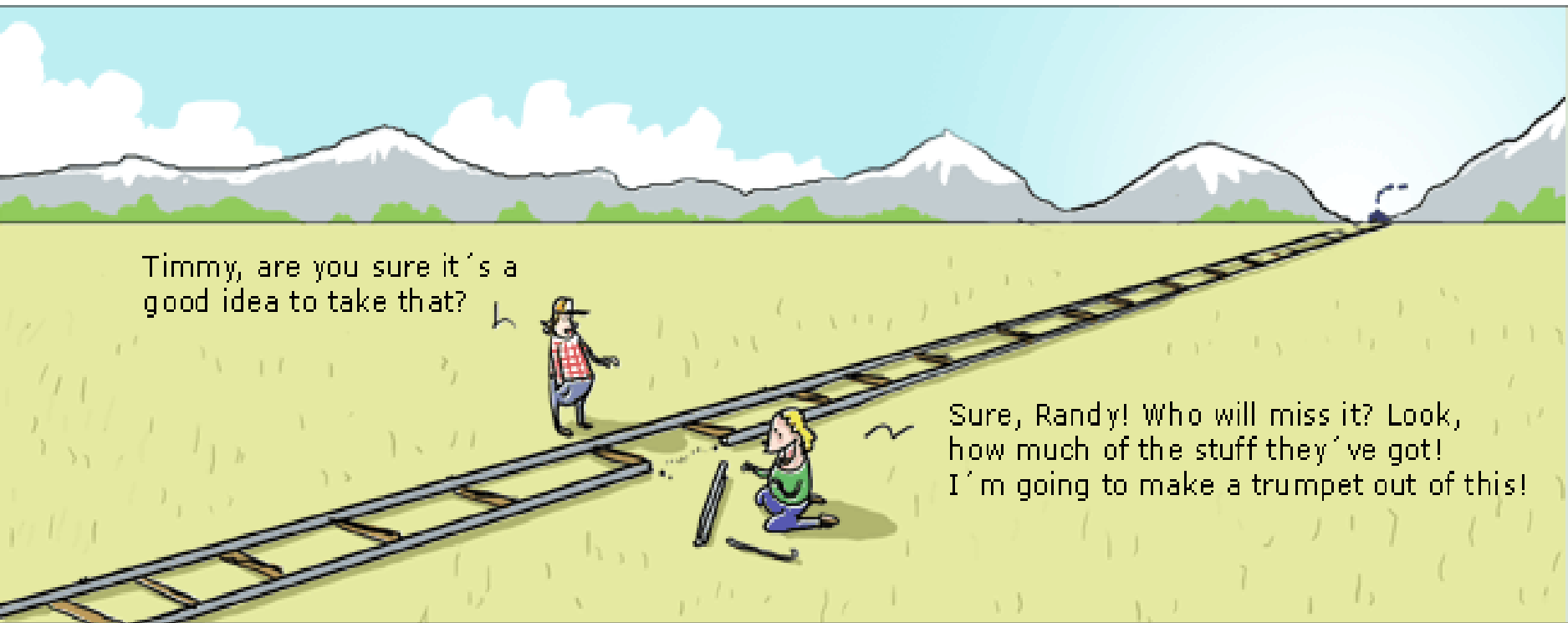


## 2. The Supply Chain in Fisheries and Fish Farming, objectives

---

- The participants will learn how to analyse the value adding along the supply chain and the build-up of costs and prices. Also this module gives an overview of the various activities of fisheries and fish farming, like fishing/farming, processing, storing, transporting, marketing etc

# Every small link is important!



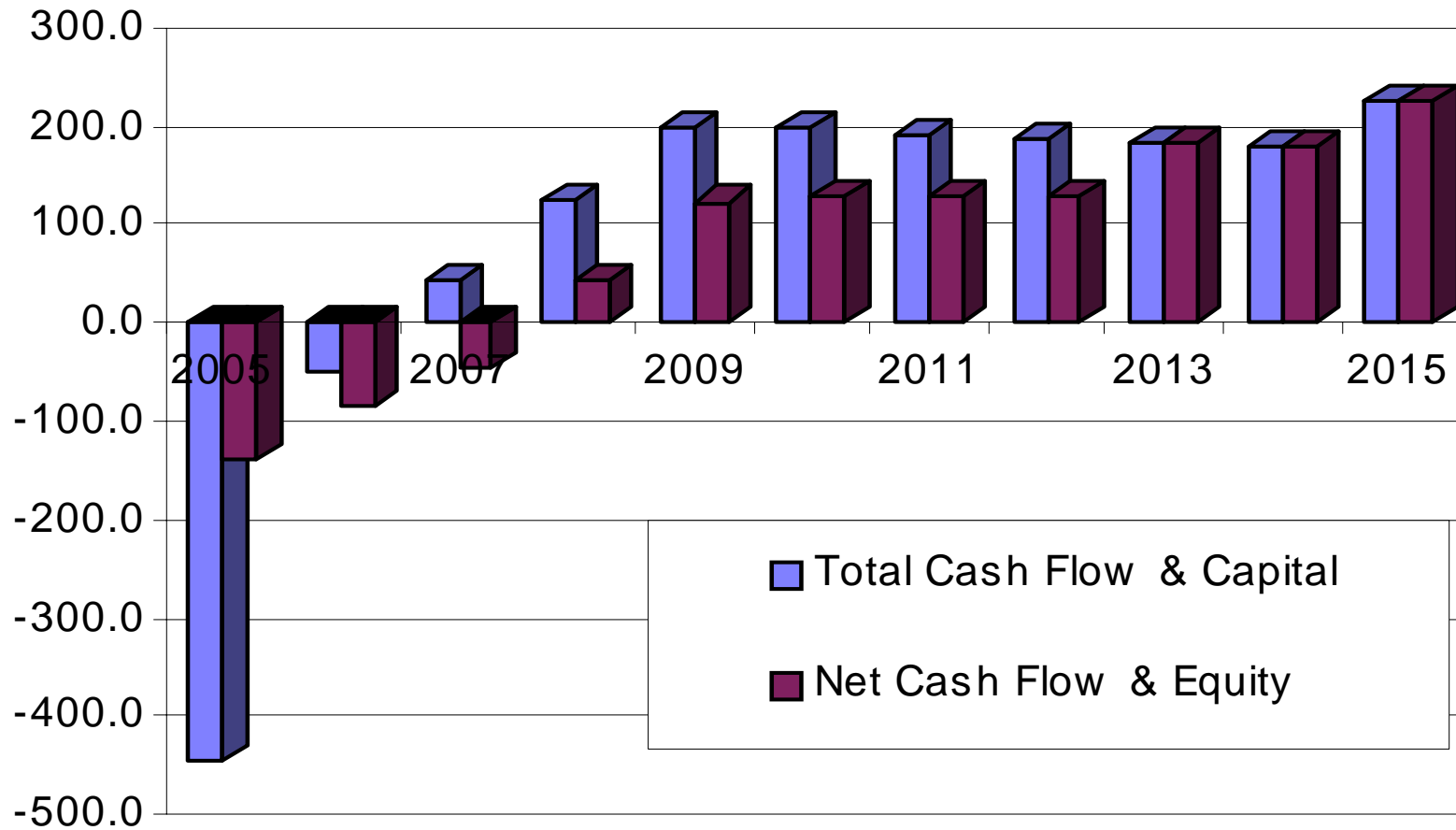


# 3. Profitability Theory and Measures, objectives

---

- This optional module is a classical short-course in standard Economic Analysis. After this part the participants should understand concepts like Net Present Value and Internal Rate of Return and be able to apply them to measure profitability of given cash flow series. This module can be skipped by those who have an economics background, like bankers and investors

# Cash Flow Series





# 4. Investment analysis, objectives

---

- After this module the participants are able to estimate the cost of initial investments, including contingencies and working capital requirement, and set up project financing with equity and loans. Also, they will learn how to calculate repayments and interests of loans. Depreciation will be addressed and annuity of capital costs will be calculated.

# Initial Costs Estimate:

## Case Study Example

### Traditional Method

estimating contingencies:

|                          | Most likely estimate |       |
|--------------------------|----------------------|-------|
| <b>Buildings:</b>        |                      |       |
| Land, roads etc          | 20                   | M USD |
| Water wells & ditches    | 5                    | "     |
| Farm house & Store       | 20                   | "     |
| Contingencies            | 5                    | "     |
| <b>Buildings Total:</b>  | <b>50</b>            | "     |
| <b>Equipment:</b>        |                      |       |
| Construct ponds          | 130                  | "     |
| Tanks                    | 10                   | "     |
| Pumps & pipes            | 15                   | "     |
| Feeding Equipment        | 25                   | "     |
| Contingencies            | 20                   | "     |
| <b>Equipment Total:</b>  | <b>200</b>           | "     |
| <b>Other Investment:</b> |                      |       |
| Consultation             | 10                   | "     |
| Design                   | 35                   | "     |
| Contingencies            | 5                    | "     |
| <b>Other Inv. Total:</b> | <b>50</b>            | "     |

|  | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|------|------|------|------|------|------|
| <b><u>Investment and Financing</u></b> |      | 1    | 2    | 3    | 4    | 5    |

**Investment:**

|                     |              |              |              |              |              |             |
|---------------------|--------------|--------------|--------------|--------------|--------------|-------------|
| Buildings           | 50.0         | 48.0         | 46.0         | 44.0         | 42.0         | 40.0        |
| Equipment           | 200.0        | 170.0        | 140.0        | 110.0        | 80.0         | 50.0        |
| Other               | 50.0         | 40.0         | 30.0         | 20.0         | 10.0         | 0.0         |
| <b>Booked Value</b> | <b>300.0</b> | <b>258.0</b> | <b>216.0</b> | <b>174.0</b> | <b>132.0</b> | <b>90.0</b> |

**Depreciation:**

|                           |            |             |             |             |             |             |
|---------------------------|------------|-------------|-------------|-------------|-------------|-------------|
| Depreciation Building: 4% |            | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         |
| Depreciation Equipm. 15%  |            | 30.0        | 30.0        | 30.0        | 30.0        | 30.0        |
| Depreciation Other 20%    |            | 10.0        | 10.0        | 10.0        | 10.0        | 10.0        |
| <b>Total Depreciation</b> | <b>0.0</b> | <b>42.0</b> | <b>42.0</b> | <b>42.0</b> | <b>42.0</b> | <b>42.0</b> |

**Financing:**

|        |     |       |
|--------|-----|-------|
|        |     | 445   |
| Equity | 30% | 133.5 |
| Loans  | 70% | 311.5 |

|                    |     |            |       |       |       |       |
|--------------------|-----|------------|-------|-------|-------|-------|
| Repayment          | 6   | <b>0.0</b> | 51.9  | 51.9  | 51.9  | 51.9  |
| Principal          |     | 311.5      | 311.5 | 259.6 | 207.7 | 155.8 |
| Interest           | 12% | 0.0        | 37.4  | 37.4  | 31.2  | 24.9  |
| Loan Managem. Fees | 2%  | 6.2        |       |       |       |       |

# Are all expenses necessary?



Milt had always dreamed about owning a sun bed



# 5. Operations Planning, objectives

---

- Here the participants are trained to plan operations over a planning horizon of 5-10 years, i.e. estimate sales and prices of products, and do a detailed breakdown of all operating expenses. The two case studies will be used here as examples.

# Operational Costs Estimates

## Case Study Example

### Variable Costs:

|                            |          |          |
|----------------------------|----------|----------|
| Raw Materials              | 1.4      | KUSD/ton |
| Labour Cost                | 1.2      | "        |
| Transportation             | 0.4      | "        |
| <b>Variable Cost Total</b> | <b>3</b> | <b>"</b> |

### Fixed Costs:

|                          |           |           |
|--------------------------|-----------|-----------|
| Maintenance              | 5         | MUSD/year |
| Housing                  | 3         | "         |
| Management               | 9         | "         |
| Sales                    | 3         | "         |
| <b>Fixed Costs Total</b> | <b>20</b> | <b>"</b>  |

### Break Even Analysis:

|                                |           |          |
|--------------------------------|-----------|----------|
| Future Sales Price             | 15        | KUSD/ton |
| <b>Net Profit Contribution</b> | <b>12</b> | <b>"</b> |

**Break Even Quantity**                      **1.7** Ktons/year

# Using models is like using glasses to see things better!



Charlie's aversion to wearing glasses led to one of the most pathetic moments ever for a criminal



## 6. Business plan, objectives

---

- To train participants in setting up a simple business plan including a planned operations statement based on the operations planning, and including calculations of taxes and duties. In this module, the participants will do drafts of business plans for the two case studies

**2005    2006    2007    2008    2009    2010**

**Operations Statement**

|                |  |            |             |              |              |              |              |
|----------------|--|------------|-------------|--------------|--------------|--------------|--------------|
| Sales          |  | 0.0        | 5.0         | 10.0         | 15.0         | 20.0         | 20.0         |
| Price          |  |            | 6.0         | 12.0         | 14.0         | 15.0         | 15.0         |
| <b>Revenue</b> |  | <b>0.0</b> | <b>30.0</b> | <b>120.0</b> | <b>210.0</b> | <b>300.0</b> | <b>300.0</b> |

|                          |    |            |              |             |              |              |              |
|--------------------------|----|------------|--------------|-------------|--------------|--------------|--------------|
| Variable Cost            | 3  | 0.0        | 60.0         | 30.0        | 45.0         | 60.0         | 60.0         |
| Fixed Cost               | 20 | 0.0        | 20.0         | 20.0        | 20.0         | 20.0         | 20.0         |
| Diverse Taxes            | 0% | 0.0        | 0.0          | 0.0         | 0.0          | 0.0          | 0.0          |
| <b>Operating Surplus</b> |    | <b>0.0</b> | <b>-50.0</b> | <b>70.0</b> | <b>145.0</b> | <b>220.0</b> | <b>220.0</b> |

|                            |  |            |              |             |              |              |              |
|----------------------------|--|------------|--------------|-------------|--------------|--------------|--------------|
| Inventory Movement         |  |            | 45.0         |             |              |              |              |
| Depreciation               |  | 0.0        | 42.0         | 42.0        | 42.0         | 42.0         | 42.0         |
| <b>Operating Gain/Loss</b> |  | <b>0.0</b> | <b>-47.0</b> | <b>28.0</b> | <b>103.0</b> | <b>178.0</b> | <b>178.0</b> |

|                          |  |             |              |             |             |              |              |
|--------------------------|--|-------------|--------------|-------------|-------------|--------------|--------------|
| Interest                 |  | 6.2         | 37.4         | 37.4        | 31.2        | 24.9         | 18.7         |
| <b>Profit before Tax</b> |  | <b>-6.2</b> | <b>-84.4</b> | <b>-9.4</b> | <b>71.9</b> | <b>153.1</b> | <b>159.3</b> |

|                         |     |             |              |             |             |              |              |
|-------------------------|-----|-------------|--------------|-------------|-------------|--------------|--------------|
| Loss Transfer           | 0   | -6.2        | -90.6        | -100.0      | -28.1       | 0.0          | 0.0          |
| Taxable Profit          |     | 0.0         | 0.0          | 0.0         | 0.0         | 124.9        | 159.3        |
| Income Tax              | 18% | 0.0         | 0.0          | 0.0         | 0.0         | 22.5         | 28.7         |
| Net Worth Tax           | 0%  | 0.0         | 0.0          | 0.0         | 0.0         | 0.0          | 0.0          |
| <b>Profit after Tax</b> |     | <b>-6.2</b> | <b>-84.4</b> | <b>-9.4</b> | <b>71.9</b> | <b>130.6</b> | <b>130.6</b> |
| Dividend                | 30% | 0.0         | 0.0          | 0.0         | 21.6        | 39.2         | 39.2         |
| <b>Net Profit/Loss</b>  |     | <b>-6.2</b> | <b>-84.4</b> | <b>-9.4</b> | <b>50.3</b> | <b>91.4</b>  | <b>91.4</b>  |

# We have built a great model!



The pyramids were the result of a 3-day bender



## 7. Balance sheet, objectives

---

- This module is not absolutely necessary for making profitability assessments, however it gives the participants insight into how operating statements, cash flows and balance sheets are linked together. Furthermore, it is the basis for calculating financial ratios, like liquid current ratio etc

**2005    2006    2007    2008    2009    2010**

**Balance Sheet**

**Assets**

|              |     |       |      |      |      |       |       |
|--------------|-----|-------|------|------|------|-------|-------|
| Cash Account | 0   | 138.8 | 52.9 | 6.6  | 48.3 | 149.6 | 237.4 |
| Debtors      | 25% | 0.0   | 7.5  | 30.0 | 52.5 | 75.0  | 75.0  |
| Stock        | 0   | 0.0   | 45.0 | 45.0 | 45.0 | 45.0  | 45.0  |

---

**Current Assets                    138.8    105.4    81.6    145.8    269.6    357.4**

|              |  |       |       |       |       |       |      |
|--------------|--|-------|-------|-------|-------|-------|------|
| Fixed Assets |  | 300.0 | 258.0 | 216.0 | 174.0 | 132.0 | 90.0 |
|--------------|--|-------|-------|-------|-------|-------|------|

---

**Total Assets                    438.8    363.4    297.6    319.8    401.6    447.4**

---

**Debts**

|                     |     |     |      |      |      |      |      |
|---------------------|-----|-----|------|------|------|------|------|
| Dividend Payable    |     | 0.0 | 0.0  | 0.0  | 21.6 | 39.2 | 39.2 |
| Taxes Payable       |     | 0.0 | 0.0  | 0.0  | 0.0  | 22.5 | 28.7 |
| Creditors           | 15% | 0.0 | 9.0  | 4.5  | 6.8  | 9.0  | 9.0  |
| Next Year Repayment |     | 0.0 | 51.9 | 51.9 | 51.9 | 51.9 | 51.9 |

---

**Current Liabilities                0.0    60.9    56.4    80.2    122.6    128.8**

|                 |  |       |       |       |       |       |      |
|-----------------|--|-------|-------|-------|-------|-------|------|
| Long Term Loans |  | 311.5 | 259.6 | 207.7 | 155.8 | 103.8 | 51.9 |
|-----------------|--|-------|-------|-------|-------|-------|------|

---

**Total Debt                    311.5    320.5    264.1    236.0    226.4    180.7**

|        |  |       |       |       |       |       |       |
|--------|--|-------|-------|-------|-------|-------|-------|
| Equity |  | 133.5 | 133.5 | 133.5 | 133.5 | 133.5 | 133.5 |
|--------|--|-------|-------|-------|-------|-------|-------|

|                      |   |      |       |        |       |      |       |
|----------------------|---|------|-------|--------|-------|------|-------|
| Profit & Loss Balanc | 0 | -6.2 | -90.6 | -100.0 | -49.7 | 41.7 | 133.2 |
|----------------------|---|------|-------|--------|-------|------|-------|

---

**Total Capital                    127.3    42.9    33.5    83.8    175.2    266.7**

---

**Debts and Capital                438.8    363.4    297.6    319.8    401.6    447.4**

---

Páll Jensson, Professor University  
of Iceland

# Sure your model is debugged?



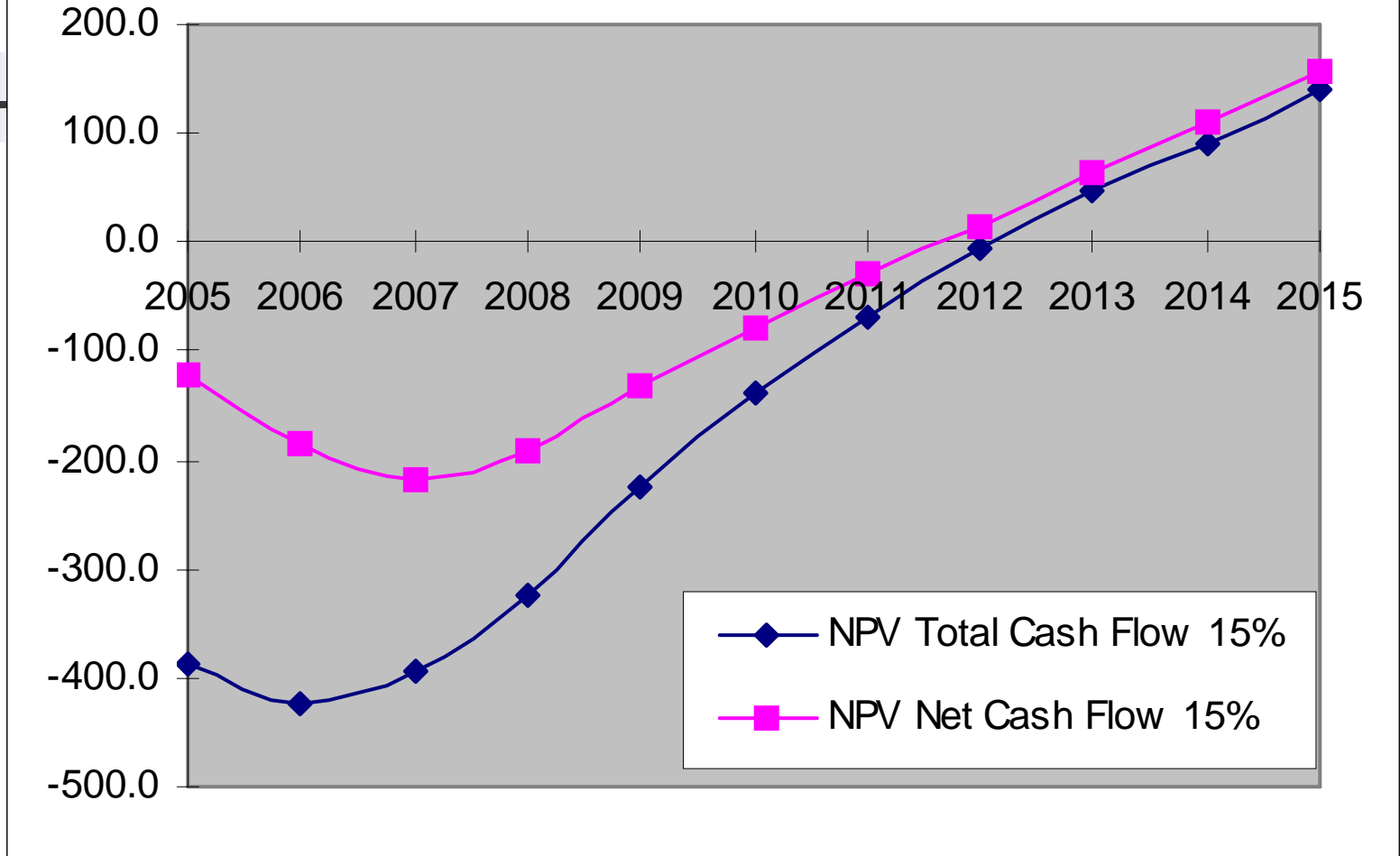


# 8. Cash flow Analysis, objectives

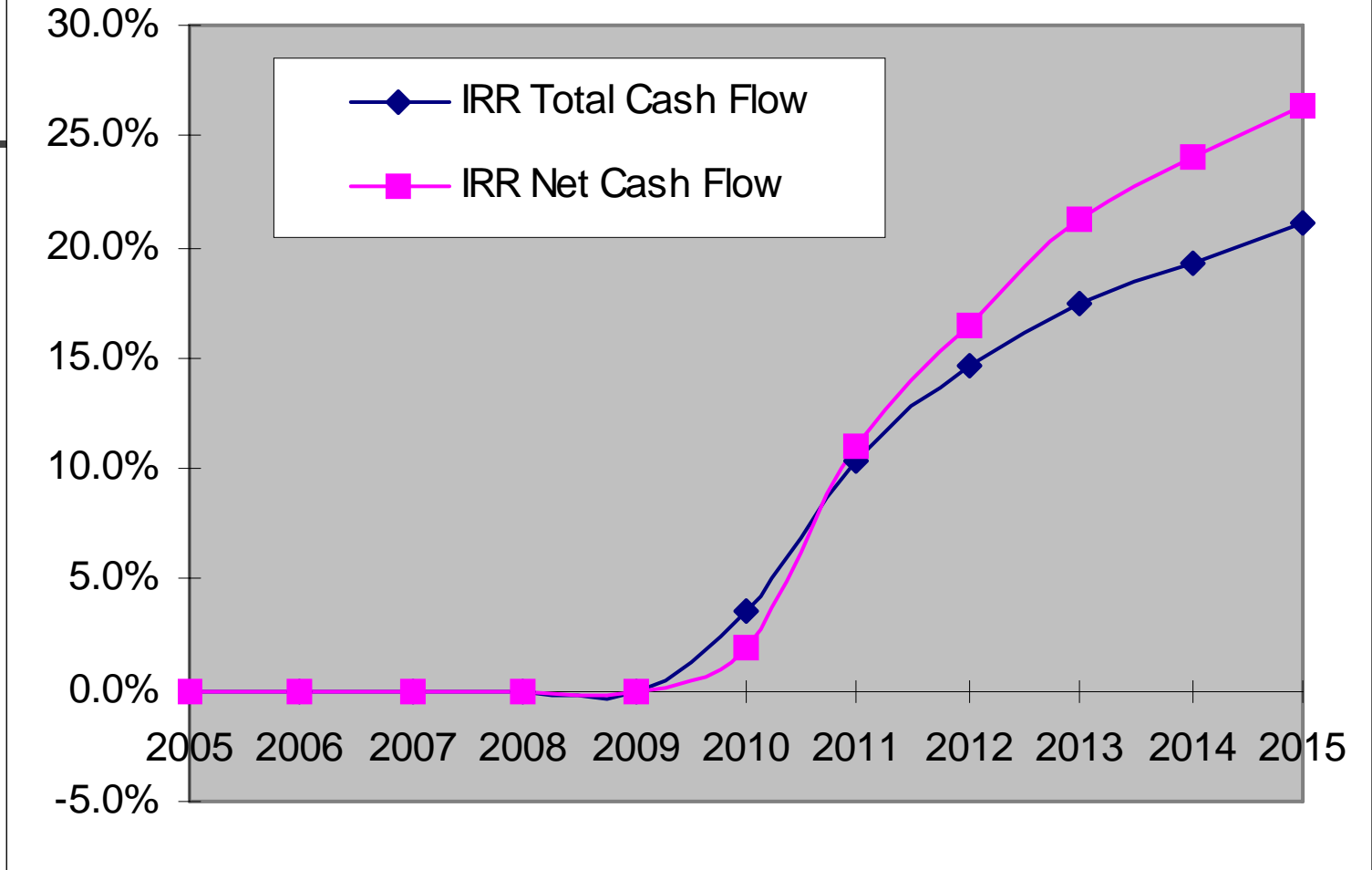
---

- To learn how to build up cash flow plans on the basis of operating statements and how to calculate profitability. This module together with modules 4-6, provides the basis for profitability assessment. Profitability for the two case studies will be calculated.

# Accumulated Net Present Value

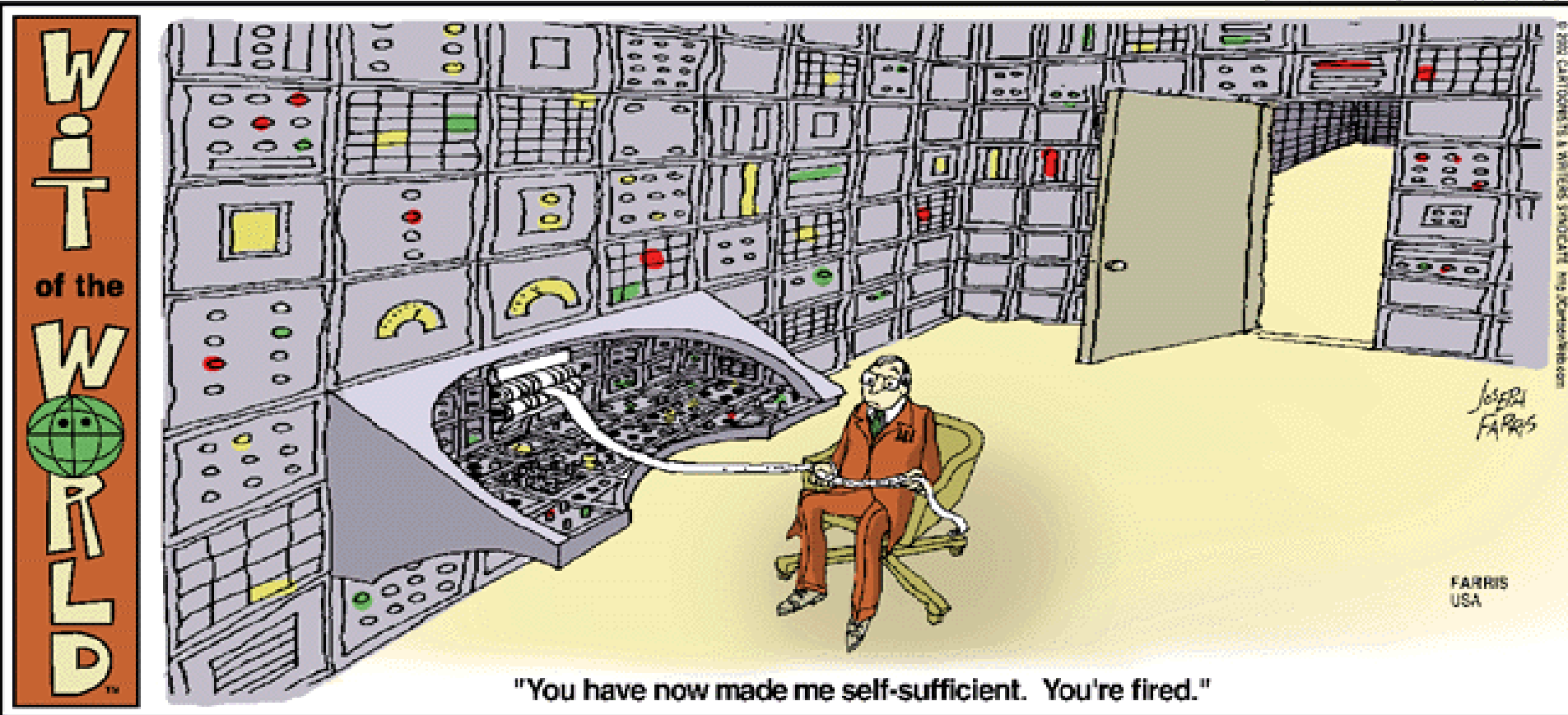


# Internal Rate of Return



# Computer models are powerful!

RELEASE WEEK OF: 06/23/02



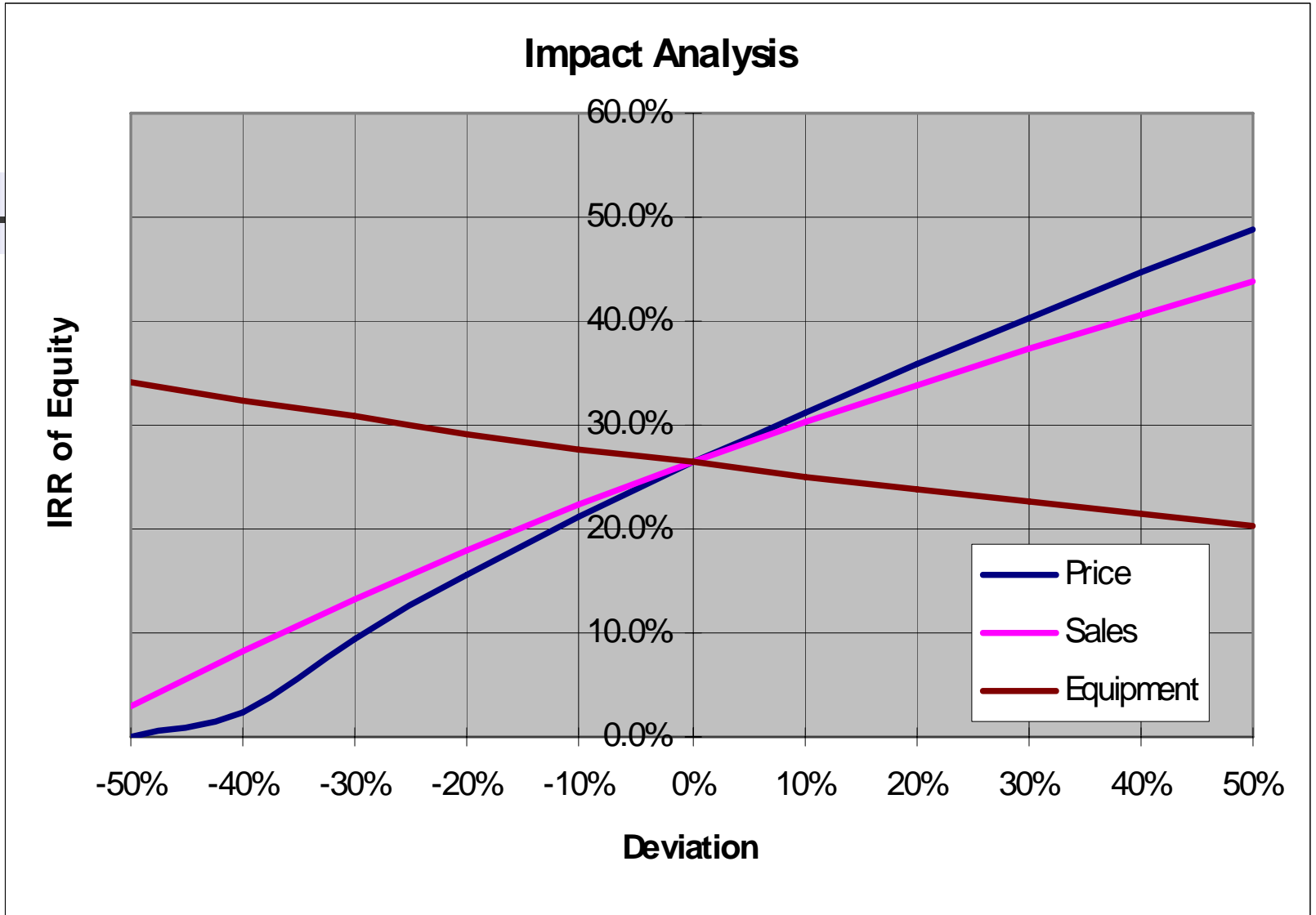
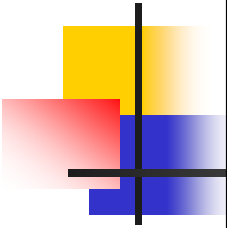
"You have now made me self-sufficient. You're fired."

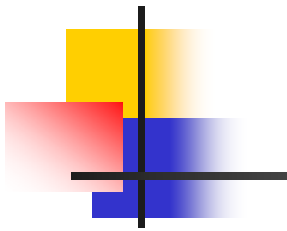


# 9. Sensitivity analysis, objectives

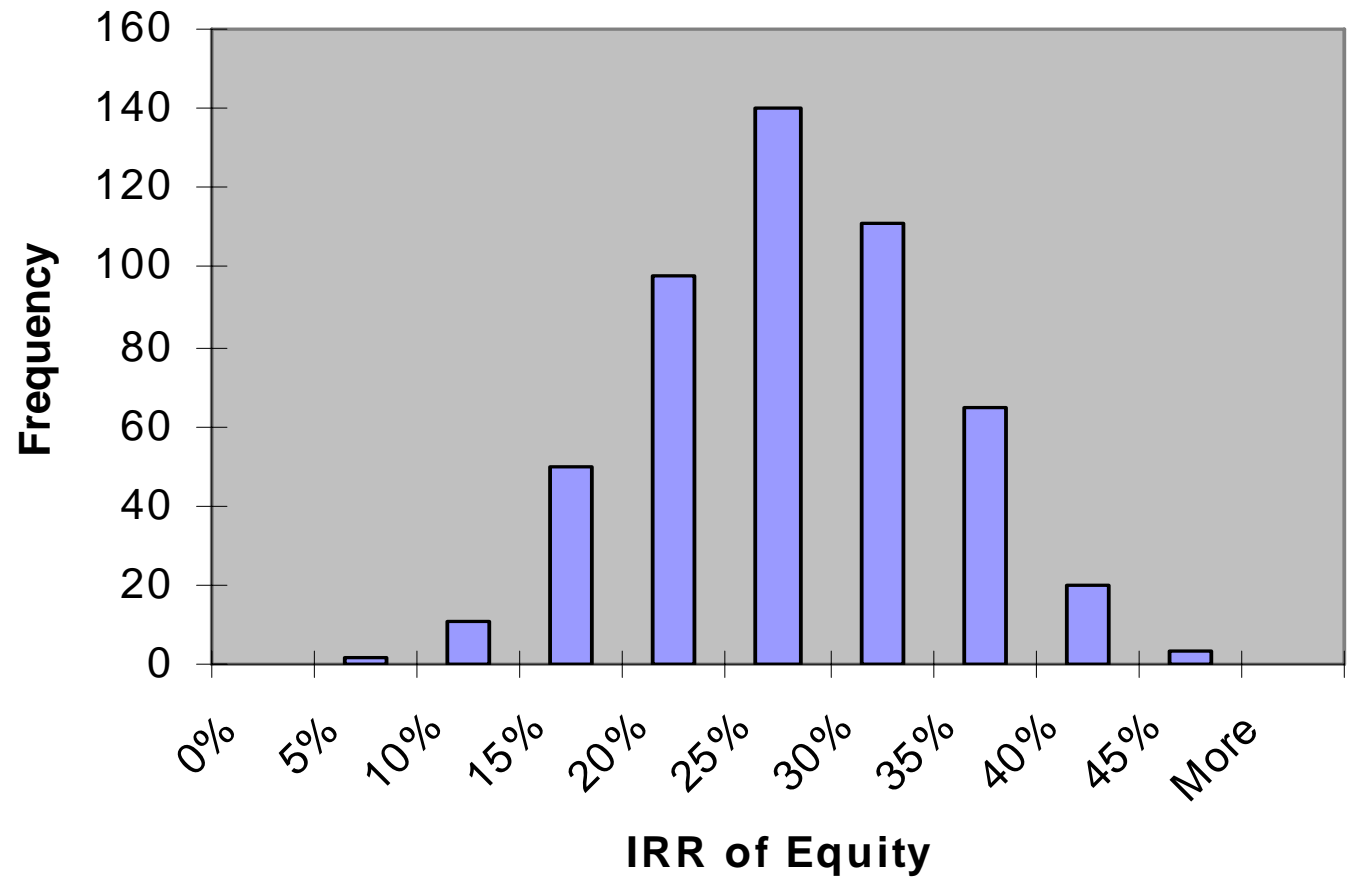
---

- To learn how to analyse uncertainty factors and their impact on project outcome. After this module the participants will be able to do risk assessment in a simple way with sensitivity calculations and scenario analysis, and in a more advanced way with Monte Carlo Simulations





## Histogram for Risk Assessment



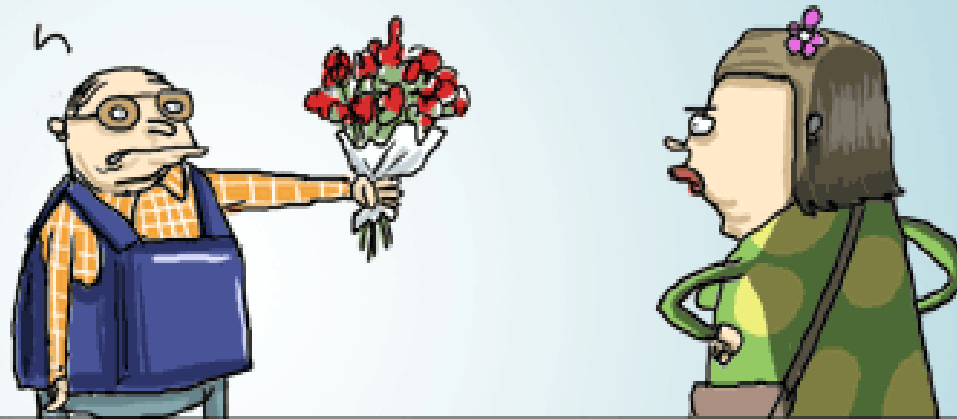


## Scenario Summary

|                               | <u>Current Values:</u> | <u>Optimistic</u>   | <u>Pessimistic</u> |
|-------------------------------|------------------------|---------------------|--------------------|
| <b><u>Changing Cells:</u></b> |                        |                     |                    |
| <b><u>Equipment</u></b>       | <b><u>100%</u></b>     | <b><u>90%</u></b>   | <b><u>120%</u></b> |
| <b><u>Sales Quantity</u></b>  | <b><u>100%</u></b>     | <b><u>120%</u></b>  | <b><u>90%</u></b>  |
| <b><u>Sales Price</u></b>     | <b><u>100%</u></b>     | <b><u>130%</u></b>  | <b><u>80%</u></b>  |
| <b><u>Result Cells:</u></b>   |                        |                     |                    |
| <b><u>IRR Total</u></b>       | <b><u>19.2%</u></b>    | <b><u>33.4%</u></b> | <b><u>9.5%</u></b> |
| <b><u>IRR Equity</u></b>      | <b><u>23.7%</u></b>    | <b><u>48.1%</u></b> | <b><u>7.4%</u></b> |

# Pessimistic scenarios are more common than optimistic!

Sorry, but I've been hurt before ...



Alvin always wore a bulletproof vest on dates



# 10. Real life exercise assignment, objectives

---

- The modular Excel model that was developed by the participants in parts 4-8 will now be used to evaluate the profitability of a real life project preferably selected by the participants themselves. This is considered very important in order to ensure that what was learned will stay

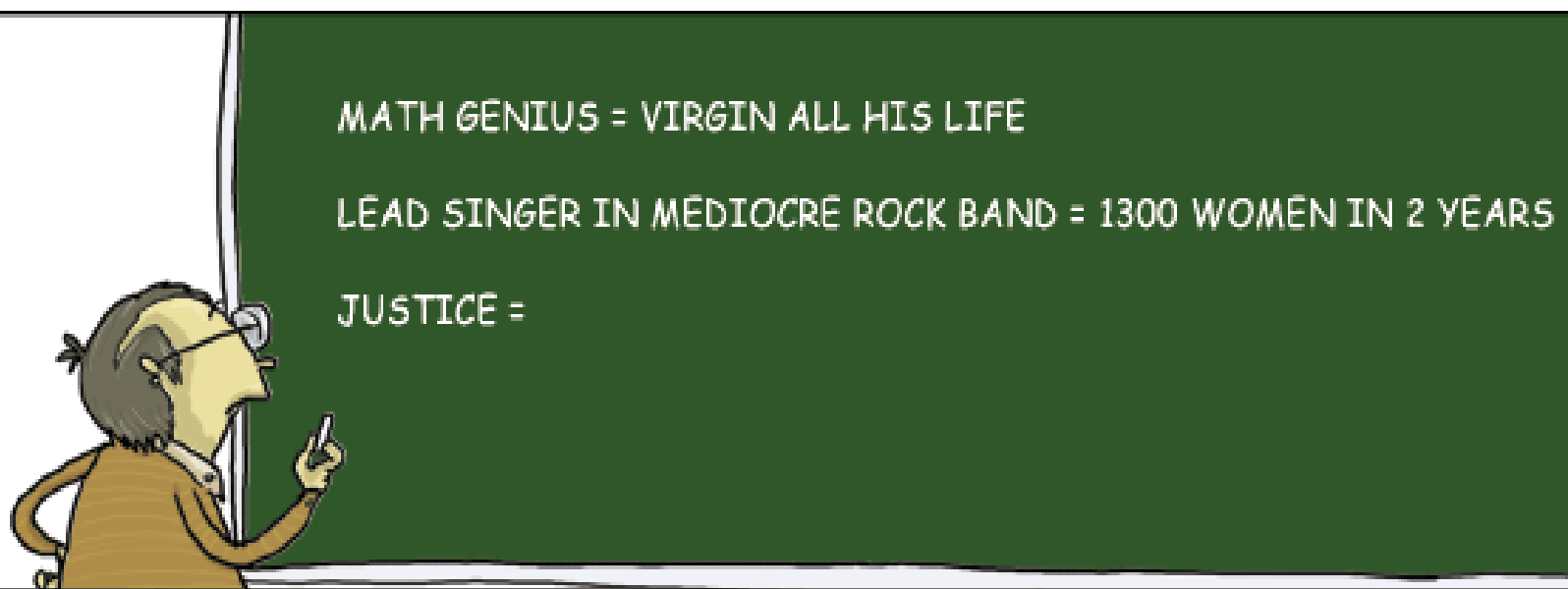


# 10. Real life exercise assignment, content

---

- Data Collection, Assumptions and Estimations
- Adapting the Profitability Model to the Assignment Case
- Analysis of Results
- Other views and considerations than economical
- Final Report on Feasibility Study

# Remember, there is more to life than numbers!



Math genius tries to solve his hardest calculation ever



# Course Form

---

- Hands-on work in Excel gradually building up a profitability model
- The course will end with a report describing a real life case assignment
- Typical time span 8-10 days
- Assignment project work either individually or in small groups



# Feasibility Study Final Report

---

- Writing final report:
  - Background of the proposed project
  - Main assumptions and data
  - Main results and findings
  - Sensitivity analysis and scenarios
  - Discussion and conclusion
  - Appendices: Tables etc
- Also group presentations

# Will we achieve anything?

You've been gone for four years! And according to this you've only travelled eleven inches! Eleven in four years! And you call yourself an explorer!



Columbus and his mum