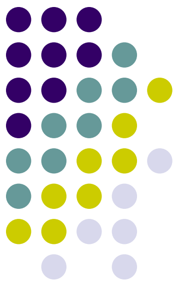

Risk Management 2009,

Risk Management in High-tech Industry-Is it Possible & How to Take Advantage of the Crisis

Prof. Dan Galai

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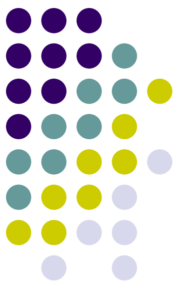
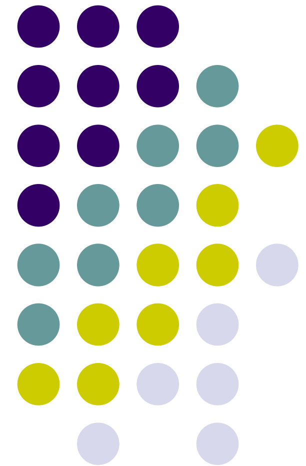
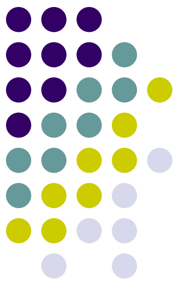


Dan Galai is the Abe Gray Professor of Finance and Business Administration at the Hebrew University, School of Business Administration, in Jerusalem. He was a Visiting Professor of Finance at INSEAD and has also taught at the University of California, Los Angeles, and the University of Chicago, as well as New York University. Dr. Galai holds a Ph.D. from the University of Chicago and undergraduate and graduate degrees from the Hebrew University. He has served as a consultant for the Chicago Board Options Exchange and the American Stock Exchange as well as for major banks. He has published numerous articles in leading business and finance journals, on options, financial assets, and corporate finance, and was a winner of the first Annual Pomeranze Prize for excellence in options research presented by the CBOE. He coauthored Risk Management and The Essentials of Risk Management, both published by McGraw-Hill. Dr. Galai is a Principal in SIMGA P.C.M., which is engaged in portfolio management and corporate finance.

I. Required Steps in Risk Management

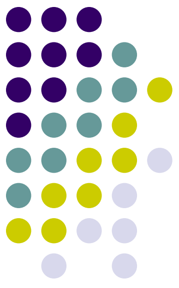


Required Steps in Risk Management



1. Determine an Objective Function, and Set Limits.
2. Map Risks.
3. Find Relevant Instruments for Risk Management.
4. Construct a Strategy.
5. Implement Strategy/Tactics.
6. Check Performance (against Objective Function).

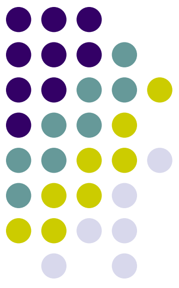
1. Determine an Objective Function



The objective function must

- Be feasible
- Define “Risk Appetite”
- Be consistent with overall strategic plan of the firm
- Take risk-return trade-offs into account
- Be reevaluated after a certain period or with changing conditions.

1. Determine an Objective Function



Some difficult issues:

How to determine the Risk-Return trade-offs

How to set risk limits

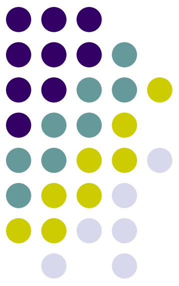
What is the relevant time horizon

Accounting vs economic profits

What risks should be taken into consideration

Top-down approach

1. Determine an Objective Function



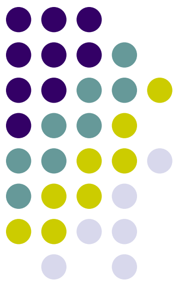
Type I vs. Type II errors:

Type I- Accept what should be rejected

Type II- Reject what should be accepted

Example: Elron and Cisco

1. Determine an Objective Function



Special issue for start-up companies:

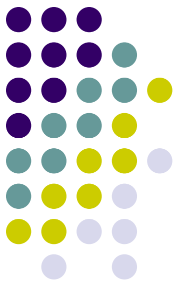
Diversification vs. Focus

(The problem of Idiosyncretic Risk)

Examples: Oridion

Nexsense

The Economists's Accepted Objective Function*:



Maximize market value of the firm/bank

Accept projects with ANPV≥0

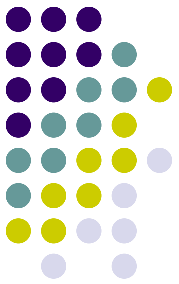
How to adjust for risks?

How to account for dependencies?

Implementation problems

All economic models are based on a Perfect Capital Markets (PCM) assumptions.

2. Map Risks



-Technological Risk vs. commercial Risk

-Business risk vs. financial risk

-Financial risks:

Market Risk

Credit Risk

-Non-financial risks:

Operational Risk

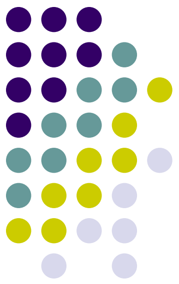
Business Risk

Reputation Risk

-Systematic vs. nonsystematic (idiosyncratic) risk.

-Insurable risk vs. hedgeable risk vs. non-insurable and non-hedgeable risk.

Map Risks

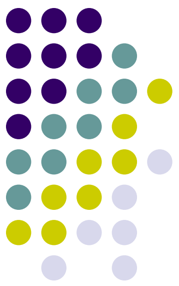


- Size of investment
- Time Horizon
- Regulatory environment

e.g. Cleantech, Chemistry, Pharma. Medical devices vs. Internet

Schematic presentation, by categories, of the risk exposures.

(need to made comprehensively disclosed Risks in Pillar 3)



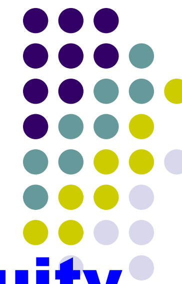
One can “slice and dice” these multiple dimensions of risk

- Risks
  - Market Risk
    - Equity Risk
    - Interest Rate Risk
      - Trading Risk
        - “Specific Risk”
        - General Market Risk
      - Gap Risk
    - Currency Risk
    - Commodity Risk
  - Credit Risk
    - Transaction Risk
    - Portfolio Concentration Risk
      - Counterparty Risk
      - Issuer Risk
      - Issue Risk
  - Operational Risk
  - Business Risk
  - Reputation & Strategic risks

•For more details, see “Essentials of Risk Management”

• by Crouhy, Galai and Mark (McGraw Hill)

Firm-wide Approach to Risk Management



Assets	Liabilities + Equity
Risky Assets	Debt
Riskless Assets	Equity
Total Assets	Total Liabilities + Equity

Assets:

Business Risk
- demand/supply
- competition
- efficiency of factors of production

Operational Risk
- human
- technology
- model

Market Risk
- stocks
- bonds
- FX
- commodities

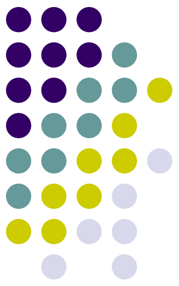
Liquidity Risk
- efficiency of markets

Credit Risk
- loans
- counter party
- guarantees

Liabilities + Equity:

Market Risk
- interest rate
- FX
- Inflation
- Stock Market

3. Instruments for Risk Management



Internal instruments

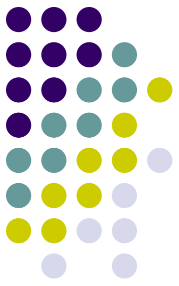
External instruments:

market traded vs. OTC

Accounting and tax treatment

Time horizon

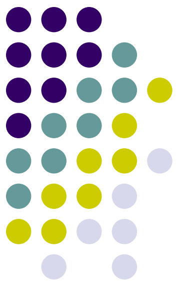
3. Instruments for Risk Management



- What about buying a put option on the company's shares? –Cephalon's example

- Budget vs. Actual expenses

- Timetable & Milestones



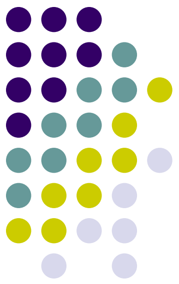
4. Construct a Strategy

Determine risks to mitigate

Determine time horizon for hedging

Budget risk management

What is the Business Model



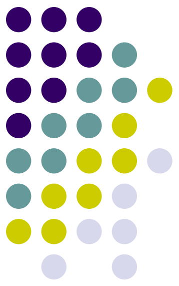
5. Implement Strategy

Consistency of Risk Management with Business Strategy of the Bank.

Timetable: Actual vs. Planned

Costs/Benefits Considerations.

Synchronization of Various Systems in the Firm



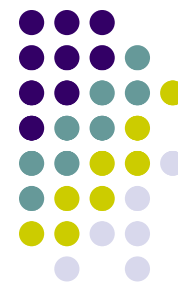
6. Check Performance

Continuous Process.

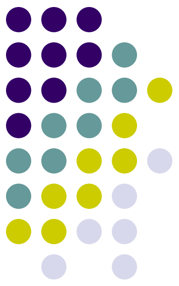
Always, check against Objectives.

Importance of changing directions if circumstances change

What firms should do?



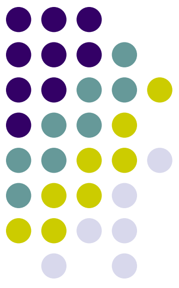
- Define a clear strategy now, facing the new business environment and the enhanced risks.
- Define your “Risk Appetite”
- Stress test the business and locate the major exposures that can affect the business in the next year, and over longer horizons.
- Find out whether you can raise money and at what cost?
- Define whether you currently want to preserve the existing business, or do you want to down-size it, or whether you want to look for business opportunities.



What firms should do?

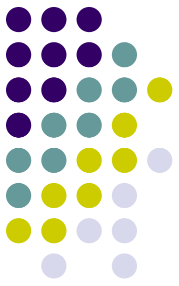
- Define simple exposure limits- it is effective.
- “Hit Parade” of major risks.
- Try to analyze the risk exposures of your suppliers and competitors.
- Check in-house incentives to key people to see that they are aligned with the firm’s objectives and do not encourage risk taking behavior.

Investment opportunities



- Recession is the only time a company can take real measures to become more effective- do it!
- Crisis creates excellent investment opportunities. Prices are affordable. Locate, identify and analyze business opportunities.
- Don’t save on due diligence- it is even more important during tough times.

Incentives and Risk Management



- Spread bonuses over a long enough period.
- Adjust bonuses for risks associated with the activities.
- Should you use options plans (ESOPs)?