

# CASE STUDY



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# Objectives

## *Return*

It may include a required return that is critical to achieve and a higher desired return to accomplish secondary objectives:

- **Required returns:** money to fund living expenses, the associated taxes, money for new home and inflation protection
- **Desired goals:** money for gifts to the nieces, charitable giving; gifts for nieces have higher priority;

The secondary objective of charitable giving could be deferred, pending what happens with the „bonus pay-off” in year 3

The reinvestment of the \$60,000,000 net proceeds from the sale will be critical to meet return objective

# Objectives

## *Return*

- Non-recurring cash flow during the next 5 years:

Salary (after tax)	+\$3,500,000
Home sale	+\$2,000,000
Home construction	-\$10,000,000
Gifts	-\$5,000,000
<b>Net outflows</b>	<b>-\$9,500,000</b>

- Setting the outflows aside from the \$60,000,000 there is \$50,500,000 available to invest
- The required return to cover living expenses is 5,9% + expected inflation of 2%
- Total required return: 7,9% after tax**



# Objectives

## *Risk*

- Tom's **willingness to take risk** appears to be high:
  - His personality profile confirms his tolerance for risk
  - His views on international markets confirm his comfort with accepting volatility
  
- Tom's **ability to take risk** also seems high:
  - Even though he has reached the retirement stage of the lifecycle, he is young, healthy and has significant assets
  
- **The risk objective: moderately high**

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# Constraints

## *Liquidity*

- Liquidity is necessary to meet ongoing living expenses and as emergency reserve to meet unexpected events
- The need for liquidity can be met either from the portfolio's income, a reserve held in cash equivalents or asset sales
- **Because of significant non-recurring cash flows over the next 5 years, Tom should set aside \$9,500,000 in cash equivalents and short-term bonds**
- In longer term maintaining a cash reserve of up to one year's living expenses would be prudent



# Constraints

## *Time Horizon*

- Considering young age and good health, the time horizon over which the portfolio must support Tom's lifestyle is **long (25 years or more)**
- There are also **shorter horizons** over which significant changes will occur. They are addressed by the liquidity reserve and reconsidering objectives when the bonus becomes known





# Constraints

## *Taxes*

- Subject to:
  - Income tax (30%)
  - Gains tax (15%)
  
- For the fixed- income portion of the portfolio, municipal bonds should be appropriate, as in U.S. interest on such bonds is not subject to federal income tax



# Constraints

## *Legal & Regulatory*

No specific issues beyond normal duty  
to the client



# Constraints

## *Unique Circumstances*

- Tom wants to see at least 50% of equity investments in international assets, including at least 20% in emerging markets
- Significant assets are not addressed in the policy: the new home and the retirement account, that Tom wants to managed himself
- The bonus payout in 3 years and a potential charitable gifting will have to be addressed

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# Capital Market Expectations

THERE ARE FOUR PROPOSED STRATEGIC ALLOCATIONS FOR THOMPSONS

asset class	expected total return	income return	standard deviation	asset mix			
				1	2	3	4
cash equivalents	4,0%	4,0%	3,0%	25%	5%	0%	5%
domestic bonds	6,0%	6,0%	10,0%	10%	0%	5%	5%
tax-exempt bonds	7,0%	7,0%	10,0%	15%	10%	15%	25%
U.S. equities	11,0%	2,0%	16,0%	30%	35%	50%	25%
international equit.	13,0%	1,0%	20,0%	10%	20%	20%	15%
emerging markets	14,5%	0,1%	27,0%	0%	15%	0%	10%
real estate	10,0%	4,0%	13,0%	5%	10%	5%	15%
venture capital	20,0%	0,0%	50,0%	5%	5%	5%	0%



# Asset Allocation

- A process of elimination can be used to remove some unacceptable asset mix choices that do not meet minimum requirements or „safety-first” rules that have been pre-specified for the portfolio
- Suppose Mr. Thompson has indicated that he will accept high risk, but a reasonably expected worst case annual return should not exceed -17% (the worst case is defined as 2 standard deviations below the expected return)
- Based on this safety-rule, portfolio #3 should be excluded

A vertical image on the left side of the slide shows a white globe with a grid of latitude and longitude lines. The globe is resting on a desk with several financial charts and documents. One chart shows a jagged line graph with a peak and a trough. Another document has the word 'NOW' printed on it. The overall scene is a professional financial workspace.

# Asset Allocation

- Interestingly, portfolio #3 might have been naively expected to be less risky than #2 because it has more bonds (low risk assets) and no emerging markets (the higher risk assets).
- However, this type of naive-stand alone assets analysis misses the diversification benefits of the higher weightings in asset with low correlations in portfolio #2 (emerging markets and real estate)

A vertical image on the left side of the slide shows a white globe with a grid of latitude and longitude lines. The globe is resting on a desk with several financial charts and documents. One chart shows a jagged line graph, and another has the word 'NOW' visible. The background is a light, neutral color.

# Asset Allocation

- A simple deterministic approach to portfolio selection focuses only on the expected return of the portfolio (i.e. the weighted average return of portfolio assets). It ignores the risk
- Portfolio risk can be modeled using standard deviations of the assets and their return correlations
- For a more robust and complete understanding of the risk-return trade-off, **Monte Carlo simulations** should be used



# Asset Allocation

<b>Asset mix</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Pre-tax Total Return	8,8%	11,5%	11,0%	9,9%
After-tax Total Return	6,9%	9,5%	8,9%	7,9%
After-tax Income Return	2,5%	1,6%	1,9%	2,5%
Standard Deviation	11,2%	13,6%	14,7%	11,8%
Sharpe Ratio	0,39	0,55	0,48	0,50
Worst Case Return (Pre-tax)	-14%	-16%	-18%	-14%

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# Asset Allocation

- **Asset mix #2 would be suitable strategic mix**
- It emphasizes **long-term growth**
- It captures the **diversification benefits** of different assets
- Its **standard deviation** and **worst-case returns** are **consistent with the risk objectives**
- **Expected return** is somewhat above the required return of **7,9%**

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# Monte Carlo Simulation

- It is used to develop probabilistic weighted results across thousands of simulated outcomes
- Simulation allows answering „what if” questions (such as „if I lower my annual worst case return on annual standard deviation, how much do I increase my most likely 20-year ending value?”, etc.)
- Simulation is well suited to complex tax rules where the tax is dependent upon the specific events along each simulated outcome
- Simulation can be used to answer questions when the distributions of returns are not normally distributed (such as when option features are present)



# Prepare an IPS for Thompson's case