Approved Prep Provider

CFA Institute

Level III – Cases in Portfolio Management and Risk Management

Case Study in Risk Management: Private Wealth

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Risk Management for Individuals

Overview of Private Wealth Management

2. Background of Eurolandia

Eurolandia is a hypothetical country in the eurozone

Stable economy

Inflation is 1%

Risk free rate is 3%

State pension and social security benefits increase by 1% annually in real terms

1. Government Pension Plan
2. Health System
3. Unemployment Insurance
4. Disability Insurance
5. Education
6. Social Security Contributions and Tax Rates

2.1 Government Pension Plan

- All residents who are employed are enrolled in a mandatory government pension plan
- Retirement income for those who have been enrolled for most of their working lives
- 13,500 annual pension for non-government employees
- 20,000 annual pension or 55% of final salary for government employees
- Above amounts are expected to increase by 2% per year
- Surviving family members don’t get benefit when retiree dies

2.2 Health System

- Health insurance is compulsory
- Contributions are deducted from salary
- Covers majority of health care expenses
- Small co-payments

2.3 Unemployment Insurance

- Unemployment insurance is compulsory
- Premiums paid in the form of social security contributions
- Unemployment benefits capped at a low amount
- People in long-term unemployment receive means-tested income support (up to 12,000 per year)

2.4 Disability Insurance

- Social security contributions also fund disability insurance
- Program provides income if one is unable to work because of serious illness or disability
- Level is capped at 18,000 per year for non-government employees and 21,600 per year for government employees

2.5 Education

- Education is provided and funded by the government
- Education is almost free to residents of the European Economic Area
- Government funding extends to master's-level degrees

2.6 Social Security Contributions and Tax Rates

- Employees pay 9% social security contributions on gross salaries that exceed 15,000 per year
- Contribution capped at 10,000 per family per year
- Tax incentives for voluntary contributions to government-regulated defined contribution and private pension savings plans
  - Government adds 25% to a member's contribution
  - No tax on investment returns within regulated pension savings plans
- Retirement age is 65
- Tax-free lump sum withdraws of up to 25% are allowed from age 55
- Realized net capital gains on investments outside regulated pension schemes are taxed at 30% on amounts exceeding 25,000 per person per year

Yearly Taxable Income (€)	Marginal Tax Rate
0 to 15,000	0%
15,000 to 50,000	30%
Above 50,000	40%

Note: The €15,000 and €50,000 thresholds and the €10,000 cap are annually adjusted for inflation. Mortgage interest is not tax deductible.

3. The Schmitt Family in Their Early Career Stage

1. Initial Case Facts
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3. The Schmitts Purchase Their Home
4. Review of risk Management Arrangements Following the House Purchase

3.1 Initial Case Facts

Early Career → Career Development → Peak Accumulation → Early Retirement

Paul and Jessica Schmitt, both 28 years old, recently got married

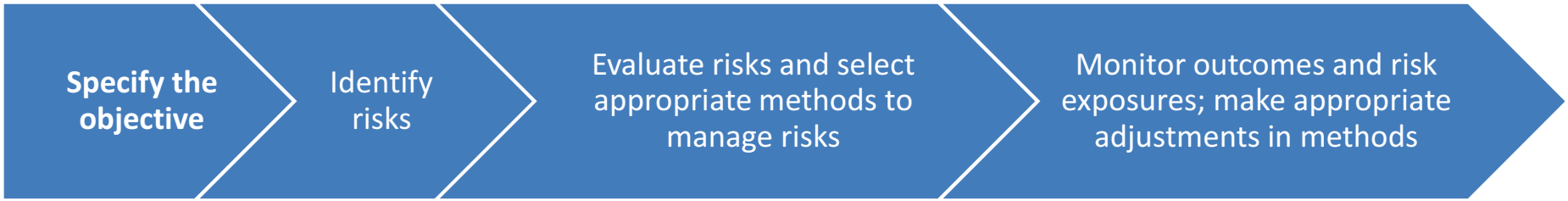
	Jessica	Paul	Combined
Annual gross income (€)	24,000	45,600	69,600
Annual net income (€)	20,490	33,670	54,160
Source of income	Information technology start up	Teaching job at state school	
Annual Living expenses (€)			34,800
Financial assets (€)			15,000
Debt (€)			0
Car (€)			7,000

The Schmitts would like to:

- Ensure long-term financial security for the family that they are hoping to start soon.
- Buy a house in an area that is very popular with young couples and has seen substantial appreciation of property values.

They approach Mr. Muller, CFA, for financial advice.

3.2 Identification and Analysis of Risk Exposures of the Schmitt Family in the Early Career Stage



Schmitts' financial objectives

- House purchase in the near future
- Long-term financial security
- Comfortable retirement

Condominium cost 270,000

Monthly payment with a 25-year mortgage is 1,360

Specify the objective → **Identify risks** → Evaluate risks and select appropriate methods to manage risks → Monitor outcomes and risk exposures; make appropriate adjustments in methods

Schmitts' have high human capital: 1) highly trained 2) young 3) work experience 4) EU citizens

$$HC_0 = \sum_{t=1}^{t=N} \frac{p(s_t)w_{t-1}(1+g_t)}{(1+r_f+y)^t}$$

	Jessica	Paul
Starting salary (net)	€20,490	€33,666
Assumed nominal salary growth rate	6%	3%
Discount rate (nominal risk-free)	3%	3%
Risk adjustment based on occupational income volatility	3%	0%
Remaining length of working life assuming retirement at age 65	37	37

Assets (€)		Liabilities (€)	
Savings account	15,000	Debt	0
Accrued entitlement to state retirement benefits (Paul)	21,000		
Accrued DB government retirement plan (Jessica)	11,800		
Paul's human capital	1,174,800	PV of lifetime consumption	1,868,000
Jessica's human capital	694,700		
Total assets	**1,917,300**	**Total liabilities**	**1,868,000**
		Net wealth	**49,300**

Risks to be evaluated:

- earnings risk resulting from loss of employment
- earnings risk resulting from health and disability
- premature death risk leading to costs imposed on the surviving partner
- car accident and repair costs
- liability risk

Analysis of identified risk

Earnings risk resulting from loss of employment

Earnings risk resulting from health and disability

Premature death risk leading to costs imposed on the surviving partner

Car accident and repair costs

Liability risk

House purchase would increase the couple's vulnerability to unexpected short-term expenditures

Recommendations for managing risk

Earnings risk resulting from loss of employment → build a buffer equal to at least six months worth of normal expenditure

Earnings risk resulting from health and disability → take out a disability insurance policy

Premature death risk → take out a life insurance policy

Car accident and repair costs → self insurance

Risks to lifestyle arising from proposed house purchase

Disability Insurance Coverage Calculation

	Jessica	Paul
Annual salary income (net) to be replaced	€20,490	€33,670
Amount of annual disability coverage provided by the social security system	€18,000	€18,000
Shortfall	€2,490	€15,670
Benefit period (until retirement age)	37 years	37 years
Assumed annual benefit adjustment (nominal)	2%	2%
Discount rate	3%	3%
PV of future earnings replacement required (calculated as PV of annuity due)	€77,700	€489,000

Annual Budget of Schmitt Family at Age 28

Combined yearly gross pay	69,600
Less taxes and Social Security contributions	(15,440)
Net pay	54,160
Living costs (including rent)	(34,800)
Net cash available	19,360

Exhibit 6: Calculating the Amount of Life Insurance Coverage

Muller explains that the amount of coverage that the life insurance policy should provide can be calculated using two methods. One is based on the value of human capital (the *human life value* method), which estimates the amount of future earnings that must be replaced. The other is the *needs analysis* method, based on estimating the amount needed to cover survivor's living expenses. He adds that both methods rely on a number of assumptions that may turn out to be inaccurate.

Muller suggests focusing on the needs analysis method at this stage of the Schmitts' careers. He explains that in the absence of debts to be repaid and absence of children whose upbringing would need to be funded, the calculation is relatively simple and involves estimating only two main items:

- Cash needs required upon death of the insured person, including funeral and burial costs, any taxes or debt to be repaid, and establishment of an emergency fund. They agree on a figure of €30,000.
- The surviving spouse's ability to cope with ongoing costs. They currently spend €34,800 per year, of which about half is spent jointly on rent and general expenditures that will remain broadly unchanged in the future. They estimate that the surviving spouse would require at least €25,000 annually for ongoing costs and that those costs would, under such circumstances, grow at 2% in nominal terms. The present value of such annual flow for the rest of the person's life is then compared with the present value of the survivor's earnings.

	Paul	Jessica
Cash needs		
Funeral and burial costs plus taxes	15,000	15,000
Emergency fund	15,000	15,000
Debts to be repaid	0	0
Total cash needs	**30,000**	**30,000**
Capital needs		
PV of surviving spouse's €25,000 annual living expenses (growing at 2% until death at age 90, discounted at 3%, annuity due)	1,169,000	1,169,000
Less PV of survivor's income until retirement at 65 (annuity due, assuming 3% growth and 3% discount rate for Paul and 6% growth and 3% discount rate plus 3% risk adjustment for Jessica)	758,000	1,246,000
Total capital needs	**411,000**	**–77,000**
Total financial needs	**441,000**	**–47,000**
Capital available:		
Cash, savings, investments	15,000	15,000
PV of vested retirement accounts (attributable to surviving spouse)	11,800	21,000
Existing life insurance coverage	0	0
Total capital available	**27,000**	**36,000**
Additional life insurance needs	414,000	–83,000

3.3 The Schmitts Purchase Their Home

Total purchase costs = €285,000, including all transaction costs, financed as follows

- Personal loan from Jessica's parents = €80,000.
- Personal funds = €5,000.
- A 25-year mortgage of €200,000 at 3.6% fixed for five years → monthly payments of €1,012 consisting of both interest and capital repayment.

The Schmitts take out property insurance with a coverage of €200,000, matching the mortgage amount

3.4 Review of risk Management Arrangements Following the House Purchase

- Earnings risk from unemployment has not changed
- Earnings risk from disability or premature death has not changed
- Level of life coverage needs to be reevaluated
- Property risk and related liability risk

Example 1: Calculation of Life Insurance Required

Using the needs analysis method (Exhibit 6), recalculate the amount of life insurance coverage the Schmitts require.

Assume that the surviving spouse continues to live in the newly purchased house, and also assume the following:

- The emergency fund would need to be increased to €30,000 because of the near-zero liquid cash resources available following the house purchase.
- The mortgage (€200,000) and loan from Jessica's parents (€80,000) are to be fully repaid, in line with local customs in the country.
- The survivor's annual costs fall to only €19,000 because of the fact that mortgage repayment costs drop out and are only partly offset by maintenance and service charges. Assuming such costs are to be paid for the rest the survivor's life (a further 62 years), and assuming a discount rate of 3% and an annual living cost increase of 2%, the PV of such future costs is about €888,000.
- The PV of the survivor's income from after-tax salary is €758,000 for Jessica and €1,246,000 for Paul, as per Exhibit 6.
- Capital available is now only €12,000 and €22,000, represented by the PV of vested retirement savings accounts for Jessica and Paul, respectively.

	Paul	Jessica
Cash needs		
Funeral and burial costs plus taxes	15,000	15,000
Mortgage retirement	200,000	200,000
Other debt (Jessica's parents' loan)	80,000	80,000
Emergency fund	30,000	30,000
Total cash needs	**325,000**	**325,000**
Capital needs		
PV of surviving spouse's living expenses (until death assumed at 90)	888,000	888,000
Less PV of survivor's income until retirement at 65 (annuity due, assuming 3% growth and 3% discount rate for Paul and 6% growth and 3% discount rate plus 3% risk adjustment for Jessica)	758,000	1,246,000
Total capital needs	**130,000**	**–358,000**
Total financial needs	**455,000**	**–33,000**
Capital available:		
Cash, savings, investments	0	0
PV of vested retirement accounts (attributable to surviving spouse)	12,000	21,000
Total capital available (excluding existing insurance coverage)	**12,000**	**21,000**
Insurance coverage required	**443,000**	**–54,000**

Example 2: Review and Reassessment of Methods

Identify possible upcoming events that should require a reassessment of the family's risk management methods.

Guideline answer:

Paul and Jessica are buying their first property, and they hope to start a family. The property purchase and the resulting changes to the risk management solutions have been completed. Preparing for the birth of a child would be the point at which a reassessment of risk management methods becomes highly desirable. This is mainly because a loss of earnings of either Paul or Jessica would seriously impair the Schmitts' ability to pay for the child's upbringing.

4. The Schmitts in Their Career Development Stage

1. Case Facts: The Schmitts Are 45
2. Financial Objectives in the Career Development Stage
3. Identification and Evaluation of Risks in the Career Development Stage
4. Recommendations to Manage Risk Exposures in the Career Development Stage

4.1 Case Facts: The Schmitts Are 45

Ms. Stein, CFA is the new private wealth adviser

Repaid loan from Jessica's parents

80,000 liquidity buffer

Roxane, 12

Peter, 7

Living expenses: 65,000/year

	Jessica	Paul	Combined
Yearly gross income (€)	80,000	66,000	**146,000**
Yearly after-tax income (€)	53,650	46,510	**100,160**
Source of income	Department head, IT	Teacher at state school	
Living expenses (€)			**65,000**
Pension provisions	Government pension scheme membership as mandated by law Plus Employer's DC scheme (annual contribution of €3,000 from Jessica and employer)	Government pension scheme as mandated by law. As a civil servant, enjoys better pension conditions No separate private pension fund	
Employer-provided insurance		Life, insurance lump sum coverage 3 × €66,000 = €198,000.	
Private life insurance	€200,000 life policy she took out after the birth of their first child.	Life policy of €440,000	
Disability insurance	Government insurance coverage of €25,200 per year. Private coverage of a lump sum of €112,200 (the original €80,000 policy taken out at age 28, reflecting 2% annual benefit adjustment)	Government insurance coverage of €30,245 per year (includes extra payment reflecting more than 10 years of service) Private coverage of a lump sum of €686,100 (the original €490,000 policy taken out at age 28, reflecting 2% annual benefit adjustment)	

4.2 Financial Objectives in the Career Development Stage

Updated financial objectives:

- maximize household welfare and reduce the impact of any unexpected events
- plan for future costs of support for Peter
- have a comfortable retirement

Economic Balance Sheet

Assets	€	Liabilities	€
Savings account	77,000	Mortgage debt	35,000
Shares of IT companies	130,000		
Accrued DB government retirement plan (Paul)	247,000		
Accrued DB government retirement plan (Jessica)	130,000		
Employer pension value (Jessica)	10,000		
Property (main residence)	320,000		
Paul's human capital	798,000	PV of lifetime consumption needs	2,379,000
Jessica's human capital	1,093,000		
Total assets	**2,805,000**	**Total liabilities**	**2,414,000**
		Net wealth	**391,000**

Human Capital Assumptions

	Jessica	Paul
Expected salary growth (nominal)	5%	2%
Discount rate (r_f)	3%	3%
Risk adjustment (y)	1%	0%
Length of working life (up to age 65)	20	20
Probability of surviving to age 65	92%	92%

Annual Budget of Schmitt Family at Age 28

Combined yearly gross pay	146,000
Less taxes and Social Security contributions	45,800
Net pay	**100,200**
Less living costs (including mortgage cost)	65,000
Less (house repair, maintenance, service charges)	3,500
Cash available for insurance and savings	**31,700**
Insurance premiums	3,500
Funds available to save or invest	**28,200**
Currently used primarily to:	
Fund investment portfolio	22,000
Add to savings accounts	3,200
Contribute to Jessica's employer's pension plan	3,000

Example 3: Identification of Risks

Identify financial risks the Schmitts face. Discuss each risk in turn.

Guideline answer:

The Schmitts face the following main risks:

- Earnings risk resulting from potential loss of employment. The risk of involuntary unemployment remains higher for Jessica than for Paul. Jessica is the higher earner, whereas Paul, a civil servant, could be expected to lose employment only under extreme circumstances. The amount at stake is greater than before because of the salary increases Jessica has enjoyed.
- Earnings risk resulting from disability. The Schmitts remain in good health, so the likelihood of them suffering from disability remains low but is higher than the risk of dying. Their salaries, however, provide their main source of income and funding of their current lifestyles. If one of them were to become disabled, the burden on the rest of the family would not only take the form of lost earnings. It would also limit the range of activities in which the surviving partner could engage, with possible implications for income and costs.
- Premature death risk. This risk remains relevant, because early death could have serious consequences for the family now that children need to be cared for. Not only would costs of bringing up children have to be covered, the surviving spouse would potentially suffer a reduction in income because all family responsibilities would now be performed only by the surviving spouse.
- Risk to the value of their growing but concentrated investment portfolio of shares of IT companies. This is the couple's main investment vehicle but is focused on a volatile sector, whose performance is correlated with Jessica's career prospects.
- Risk to their retirement lifestyle goals. If the couple's contributions to their retirement plans are insufficient or the plans perform poorly, their retirement funding could be insufficient for the standard of living they desire.
- Other risks include property and liability risks.

4.3 Identification and Evaluation of Risks in the Career Development Stage

- Assessment of earnings risk from unemployment
- Assessment of earnings risk from disability
- Assessment of premature death risk
- Analysis of the investment portfolio risks
- Analysis of the retirement savings plans
- Other risks

4.4 Recommendations to Manage Risk Exposures in the Career Development Stage

Disability Insurance Coverage Calculation at Age 45

	Jessica	Paul
Salary income (net) to be replaced	53,650	46,510
Amount of annual disability coverage currently provided by the social security system	25,200	30,245
Annual shortfall	28,400	16,265
Benefit period (until retirement age)	20 years	20 years
Assumed annual benefit adjustment	2%	2%
Discount rate	3%	3%
PV of future earnings replacement required (annuity due)	519,000	297,000

Life Insurance

- Amount of coverage that a life insurance policy should provide can be calculated using either the human capital (the human life value method), or the needs analysis method
- The human capital method estimates the amount of earnings that must be replaced
- The needs analysis method estimates the amount needed to cover survivors' living expenses

EXHIBIT 12 LIFE INSURANCE AMOUNT REQUIRED AT AGE 45

Human life value method

Stein first works out the amount of lost income replacement, adjusting after-tax income for the amount of annual expenses and the value of the person's employee benefits. Assuming the survivors would need the lost income replacement immediately, she works out the present value of an annuity due.

	Paul	Jessica
	€	€
Pretax income	66,000	80,000
After-tax income	46,510	53,650
Less adjustment for the deceased person's annual expenses that would not exist	10,000	10,000
Add value of employee benefits (retirement contribution) that family will no longer receive	10,000	4,000
Subtotal (after taxes)	46,510	47,650
Amount of pretax income required to replace after-tax income (30% rate assumed)	66,440	68,070
Annual growth rate (to reflect career advancement)	2%	5%
Discount rate	3%	3%
Present value of annuity due	1,213,000	1,644,000
Less existing life insurance (including €198,000 provided by Paul's employer)	638,000	200,000
Recommended additional life insurance	575,000	1,444,000

Needs analysis method

	Paul	Jessica
	€	€
Cash needs		
Cash needs (funeral and burial costs & taxes)	30,000	30,000
Mortgage retirement	35,000	35,000
Total cash needs	**65,000**	**65,000**
Capital needs		
PV of surviving spouse's living costs (assumed to be currently €35,000 for 45 years)	1,281,000	1,281,000
PV of Roxane's living cost (€9,000 for 10 years until graduation at age 22)	86,000	86,000
PV of Peter's living cost (€13,000 for 83 years until age 90)	743,000	743,000
Less PV of survivor's income until retirement at 65	824,000	777,000
Total capital needs	**1,286,000**	**1,333,000**
Total financial needs	**1,351,000**	**1,398,000**
Capital available:		
Cash, savings, investments	207,000	207,000
PV of vested retirement accounts (attributable to surviving spouse)	140,000	227,000
Existing life insurance coverage (including benefit provided by Paul's employer)	638,000	200,000
Total capital available	**985,000**	**634,000**
Additional life insurance needs	366,000	764,000

Example 4: Investment Risk Recommendations

Recommend and justify changes to the Schmitts' investment portfolio.

Guideline answer:

Stein has noted the correlation of the €130,000 of investment holdings in IT companies with Jessica's human capital. They should aim to hold an investment portfolio with as low correlation to one's human capital as possible. They should also move away from the concentrated nature of holdings of which they usually hold 10. In order for the Schmitts to achieve better diversification, Stein recommends that, at a minimum, any new investments are no longer made directly into shares of IT companies. Instead, they should be making regular investments into pooled investment vehicles—such as funds that are diversified across a wide range of regions, sectors, and securities—which can be done at low cost. Cost efficiency is paramount because any amount saved from initial charges or annual costs, compounded over many years, may make significant difference to long-term returns. If an active approach to investing is chosen, the additional costs that stem from such an approach should be justified by sufficient active risk-adjusted return.

Example 5: Real Estate in Investment Portfolio

The Schmitts earlier mentioned the possibility of making speculative investment in residential property (similar in size to their existing property) in the area where IT companies, including Jessica's offices, are based. Identify issues that an adviser should consider before making a recommendation.

Guideline answer:

The issue to consider is how the prospects for the local property market depend on the performance for and employment in the local IT industry. Jessica's own employment prospects depend on this industry, and purchasing a property in the area would increase the Schmitts' exposure to the local IT industry.

Funding of the purchase would also need to be considered because the cost could exceed €300,000 given that the Schmitts' property, similar in size and value to the one they are considering, is worth about €320,000. The Schmitts do not have sufficient resources available. Devoting a large proportion of their investment portfolio to a deposit and funding the rest of the purchase price using a loan would expose them to risks such as interest rate risk. A greater share of their wealth would be tied to the prospects of the local IT industry as they would no longer hold exposure to equities, foregoing benefits from diversification. They should be made aware of the fact that holding an investment property would represent a large, concentrated, illiquid position and that there are costs associated with owning and managing rental property.

Example 6: Recommendation for Retirement Saving at the Career Development Stage

Recommend methods to manage risk to retirement lifestyle goals.

Guideline answer:

Analysis of retirement plans identified a significant shortfall in the Schmitts' projected retirement income. To address the risk of having insufficient funds to maintain their lifestyle in retirement, the couple should give serious consideration to increasing the amount dedicated to retirement needs. Their monthly after-tax income of €8,350 exceeds their monthly expenditures by about €2,700, which even after the payment of insurance premiums leaves them with €2,350 (€28,200 per year) to invest. This provides them with an opportunity to boost retirement savings and build up their investment portfolio instead of continuing to build up their liquidity buffer, which is now approaching €80,000 (invested in a low-interest, instant-access bank account). The Schmitts should instead increase contributions into Jessica's pension scheme or open separate private pension plans. Doing so would also allow them to take advantage of the tax benefits of retirement saving because income and capital gains within the regulated plans are tax free, and contributions into the plans are supplemented with the 25% top-up payments from the state. Although the funds from pension plans are normally inaccessible before retirement, the tax advantages, compared with investing outside such plans, can be significant.

Additional Suggestions

- Update property insurance coverage to reflect current market value
- Consider supplementary private health insurance
- Avoid speculative real estate investment
- Stop adding to instant access savings
- Increase contributions to Jessica’s employer pension plan
- Diversify investment portfolio

5. The Schmitts in Their Peak Accumulation Stage (1/2)

- The Schmitts are 55
- Jessica's company faces an uncertain future
- Diversified investment portfolio (70% equity, 30% fixed income)
- Concerned about retirement planning

5. The Schmitts in Their Peak Accumulation Years (2/2)

	Jessica	Paul	Combined
	€	€	€
Yearly gross income	120,000	80,000	200,000
After-tax income	77,888	53,888	131,776
Source of income	Department head, IT	State teaching job	
Living expenses			75,000
Property			340,000
Bank accounts			80,900
Investment portfolio			611,400
Pension provisions	As mandated by law (state pension), plus a company-sponsored pension scheme €113,000 plus €15,000 in private pension savings	As mandated by law. Paul, as a civil servant, plus €47,500 in private pension savings	
Disability insurance	Government insurance coverage of €30,805 per year Private coverage of a lump sum of €633,900 (policy benefit was increased to €520,000 at age 45, adjusted for 2% annual benefit adjustment)	Government insurance cover of €36,966 per year (includes extra payment reflecting more than 10 years of service) Private coverage of a lump sum of €365,700 (policy provided €300,000 at age 45, adjusted for 2% annual benefit adjustment)	
Life insurance coverage (up to age 65)	€1,000,000 private policy *Note*: This amount reflects the recommendation given at age 45.	€900,000 private policy plus 3× salary insurance coverage of €240,000 provided by the employer	

5.1 Review of Objectives, Risks, and Methods of Addressing Them

Financial objectives

- Provide financial security for the family in the next 10 years while they remain in full-time employment
- Have a comfortable retirement
- Be in a position (after their retirement) to provide long-term support and assistance for Peter for the rest of his life
- Leave a meaningful inheritance for Roxane

Human Capital Assumptions at 55

	Jessica	Paul
Expected salary growth (nominal)	2%	2%
Discount rate (r_f)	3%	3%
Risk adjustment (y)	1%	0%
Remaining length of working life (up to age 65)	10	10

Economic Balance Sheet at 55

Assets		Liabilities	
Savings account	80,900	Mortgage debt	0
Investment portfolio	611,400		
Accrued DB government retirement plan (Paul)	457,000		
Accrued DB government retirement plan (Jessica)	263,000		
Employer pension value (Jessica)	113,500		
Private pension fund (Jessica)	15,000		
Private pension value (Paul)	47,500		
Property (main residence)	340,000		
Paul's human capital	486,600	PV of lifetime consumption needs	2,235,000
Jessica's human capital	668,100		
Total assets	**3,083,000**	**Total liabilities**	**2,235,000**
		Net wealth	**848,000**

Example 7: Comparison of Economic Balance

Compare the economic balance sheet at age 55, shown in Exhibit 14, with the one produced 10 years ago, shown in Exhibit 9.

Economic Balance Sheet at 45

Assets	€	Liabilities	€
Savings account	77,000	Mortgage debt	35,000
Shares of IT companies	130,000		
Accrued DB government retirement plan (Paul)	247,000		
Accrued DB government retirement plan (Jessica)	130,000		
Employer pension value (Jessica)	10,000		
Property (main residence)	320,000		
Paul's human capital	798,000	PV of lifetime consumption needs	2,379,000
Jessica's human capital	1,093,000		
Total assets	**2,805,000**	**Total liabilities**	**2,414,000**
		Net wealth	**391,000**

Economic Balance Sheet at 55

Assets		Liabilities	
Savings account	80,900	Mortgage debt	0
Investment portfolio	611,400		
Accrued DB government retirement plan (Paul)	457,000		
Accrued DB government retirement plan (Jessica)	263,000		
Employer pension value (Jessica)	113,500		
Private pension fund (Jessica)	15,000		
Private pension value (Paul)	47,500		
Property (main residence)	340,000		
Paul's human capital	486,600	PV of lifetime consumption needs	2,235,000
Jessica's human capital	668,100		
Total assets	**3,083,000**	**Total liabilities**	**2,235,000**
		Net wealth	**848,000**

Example 8: Liquidity Needs

Discuss the Schmitts' financial position with regard to their ability to meet any unexpected liquidity needs.

Guideline answer:

The level of their financial assets provides sufficient liquidity if their circumstances were to change. The Schmitts are now significantly richer in financial assets than they were 10 years earlier. They have a balance of almost €81,000 in their instant-access savings account and more than €600,000 in diversified funds that they should be able to easily exit if such need arose.

Review of Risks and Related Risk Management Methods

- Earnings risk due to disability
- Earnings risk due to unemployment
- Premature death risk
- Risk to retirement lifestyle goal
- Analysis of investment portfolio
- Analysis of asset allocation

Example 9: Analysis of Earnings Risk during Peak Accumulation Stage (1/2)

Using the information provided by the Schmitts to their adviser and the information in Exhibits 13, 15, and 16, analyze the earnings-related risks arising from unemployment and disability that the Schmitts face now that they are in the peak accumulation life stage.

Earnings Shortfall in Case of Disability at Age 55

	Jessica	Paul
Salary income (net) to be replaced	€77,900	€53,900
Amount of annual disability coverage currently provided by the social security system	€30,720	€36,870
Annual shortfall	€47,180	€17,030

Disability Insurance Coverage Assumptions

Benefit period (until retirement age)	10 years	10 years
Assumed annual benefit adjustment	2%	2%
Discount rate	3%	3%
PV of future earnings replacement required	€452,000	€163,000

	Jessica	Paul	Combined
	€	€	€
Yearly gross income	120,000	80,000	200,000
After-tax income	77,888	53,888	131,776
Source of income	Department head, IT	State teaching job	
Living expenses			75,000
Property			340,000
Bank accounts			80,900
Investment portfolio			611,400
Pension provisions	As mandated by law (state pension), plus a company-sponsored pension scheme €113,000 plus €15,000 in private pension savings	As mandated by law. Paul, as a civil servant, plus €47,500 in private pension savings	
Disability insurance	Government insurance coverage of €30,805 per year Private coverage of a lump sum of €633,900 (policy benefit was increased to €520,000 at age 45, adjusted for 2% annual benefit adjustment)	Government insurance cover of €36,966 per year (includes extra payment reflecting more than 10 years of service) Private coverage of a lump sum of €365,700 (policy provided €300,000 at age 45, adjusted for 2% annual benefit adjustment)	
Life insurance coverage (up to age 65)	€1,000,000 private policy *Note*: This amount reflects the recommendation given at age 45.	€900,000 private policy plus 3× salary insurance coverage of €240,000 provided by the employer	

Example 9: Analysis of Earnings Risk during Peak Accumulation Stage (2/2)

Guideline answer:

The Schmitts continue to face earnings risk resulting from unemployment. Jessica continues to work in a sector that shows volatile profitability. A loss of her job at her current age of 55 could make it difficult for her to find alternative employment at significantly above-average salary and level of seniority. Two facts mitigate the seriousness of this concern. First, the Schmitts have a substantial amount of savings and investments to buffer any loss of earnings. Second, Paul's employment appears secure.

The risk to their earnings from disability remains, but the level of coverage should be reassessed because their circumstances have changed and they are closer to retirement.

The amount of annual earnings not protected by the social security system is higher than was the case at age 45 for Jessica because of her salary growth. But the fact that the period over which they would rely on such benefit payments is now only 10 years means that the present value of the disability protection needed is now lower: €452,000 for Jessica and €163,000 for Paul, well below the level of their existing coverage (€633,900 and €365,700).

Exhibit 17 Human Life Method Insurance Coverage Calculation at Age 55

	Paul	Jessica
	€	€
Pretax income	80,000	120,000
After-tax income	53,900	77,900
Less adjustment for the deceased person's annual expenses that will not exist	10,000	10,000
Add value of employee benefits that the family will no longer receive	10,000	4,000
Subtotal (after taxes)	53,900	71,900
Amount of pretax income required to replace after-tax income (30% tax rate)	77,000	102,700
Annual growth rate	2%	2%
Discount rate	3%	3%
Present value of pretax income to be replaced (annuity due, 10 years)	737,000	983,000
Less existing life insurance (including current benefit €240,000 provided by Paul's employer)	1,140,000	1,000,000
Recommended additional life insurance	–403,000	–17,000

Exhibit 18 Needs Analysis Method Insurance Coverage Calculation at Age 55

	Paul	Jessica
Cash needs	€	€
Funeral and burial costs plus taxes	35000	35000
Total cash needs	**35000**	**35000**
Capital needs		
PV of surviving spouse's living expenses (until age 90)	1,191,800	1,191,800
PV of Peter's living cost (€13,000 per year, growing at 2%, until age 90)	682,000	682,000
Less PV of survivor's income until retirement at 65	685,000	494,000
Total capital needs	**1,188,800**	**1,379,800**
Total financial needs	**1,223,800**	**1,414,800**
Capital available:		
Cash, savings, investments	692,300	692,300
PV of vested retirement accounts (attributable to surviving spouse)	392,000	505,000
Existing life insurance coverage (including current benefit €240,000 provided by Paul's employer)	1,140,000	1,000,000
Total capital available	**2,224,300**	**2,197,300**
Additional life insurance needs	–1,000,500	–782,500

Assessment of Risk to Retirement Lifestyle Goal

Assets	Type and Current Value	Expected Growth Rate	Expected Value at Age 65	Expected Annual Gross Pension Benefit (€)	Risks
Paul's mandatory government pension plan	DB pension plan	—	—	€48,950 (55% of the estimated final salary)	Government may reduce retirement benefits due to fiscal pressures
Jessica's mandatory government pension plan	DB pension plan	—	—	€28,191	As above
Jessica's company pension	DC plan, Current value €113,500 Balanced fund	Annual contributions of €14,000, growing at 2% 4% annual investment returns	€350,000	€17,515	Investment risk and interest rate risk that could result in lower annuity income yield
Paul's private pension savings plan	DC plan currently valued at €47,500 Balanced fund	€6,000 annual contributions growing at 2% 3% investment returns	€135,900	€6,795	As above
Jessica's private pension savings plan	DC plan opened recently Valued at €15,000 Uses aggressive, actively managed investment strategy with high risk	€10,000 annual contributions growing at 2%. 8% investment returns	€201,600	€10,080	As above

Example 10: Withdrawal of Tax-Free Lump Sum

Regulations in Eurolandia allow members of private pension schemes to withdraw 25% of their retirement assets as a tax-free lump sum from the age of 55, the Schmitts' current age. Taking into account the analysis of their retirement assets, discuss the merits of withdrawing the tax-free lump sum at this stage.

Guideline answer:

The potential logic of withdrawing 25% of the DC funds tax free should be assessed in a broad context. The Schmitts have sufficient cash flows from earnings to be able to fund their ongoing expenses and keep adding to their investment portfolio. They are in their peak accumulation stage of their careers and are accumulating assets rather than spending. There appears to be no need for them to access the funds at this stage.

If they were to withdraw the funds now in order to invest outside their retirement programs, the couple would no longer benefit from the fact that they are accumulating assets without having to pay any capital gains or income taxes within the retirement schemes. Not withdrawing the 25% lump sum now, however, still provides them with the option of withdrawing the tax-free lump sum at a later stage.

Analysis of Investment Portfolio

Goal	NPV	Notes	Time Horizon	Required Probability of Success
Having a comfortable retirement	Not applicable	Goal is already covered by existing pension arrangements, assuming projected earnings growth rates and fund contributions are realized.	10 years	High
Providing for Peter's care	Approximately €500,000	NPV is assumption-dependent	Approximately 20 years	Nearly 100%
Leaving an inheritance for Roxane	As much as possible		>30 years	Around 60%

Analysis of Asset Allocation

Using MVO is problematic because it is a single-period framework; goals-based approach is more suitable

Peter's care: need to have at least 500,000 at the end of 20 years; volatility before that is not a major concern

- Initially 70% equities and 30% bonds
- Increase allocation to inflation-linked bonds over time

Inheritance for Roxane: Invest 110,000 in diversified global equity fund

5.2 Recommendations for Risk Management at Peak Accumulation Stage

Risk to earnings

- Risk of unemployment can not be avoided or insured against
- Disability insurance and life insurance are in place

Recommendations for retirement savings

- Continue contributing to private pension savings plans up to legally specified maximum
- Over time move to lower-risk asset allocation

Recommendations for the investment portfolio

- Continue adding 33,000 per year to investment portfolio
- For portfolio allocated to Peter's care goal, increase allocation to inflation-linked bonds
- Take advantage of 25,000 tax-free capital gains per year

Example 11: Reduction of Risk to Retirement Lifestyle Goals

Recommend and justify methods for reducing risk to retirement lifestyle goals.

Guideline answer:

The Schmitts are in a good position to retire comfortably. They should continue contributing to their private pension savings plans up to the legally specified maximum, thereby obtaining the corresponding tax advantage whereby the government adds 25% to their own contributions. Two of their private pension plans are invested in a portfolio that is diversified across asset classes and regions. Over time, the fund holdings are being gradually moved to a lower-risk asset allocation with an increasing proportion of fixed-income government securities.

Jessica's recently opened private pension plan, however, is managed aggressively at the extreme end of what regulated schemes allow. Stein explains that such a high-risk addition to their substantial retirement savings is not necessarily a cause for concern, but she urges the Schmitts to consider moving the fund choice within the scheme to a less risky, more balanced alternative.

6. The Schmitts Are about to Retire

Early Career → Career Development → Peak Accumulation → Early Retirement

	Jessica	Paul	Combined
Yearly gross income (€)	90,000	89,000	179,000
Source of income	Senior IT consultant	State teaching job	
Living expenses (€)			70,000
Property (€)			420,000
Investment portfolio (€)			1,511,000

Asset	Current Value at Age 65
Paul's mandatory government pension plan	Annual pension of €48,950 (55% of final salary of €89,000)
Jessica's mandatory government pension plan	Annual pension of €28,190
Jessica's company pension	DC plan. Fund value of €350,000 corresponding to an annual pension of €17,500
Paul's private pension savings plan	€135,000 corresponding to annual pension of €6,750
Jessica's private pension savings plan	€175,000 corresponding to annual pension of €8,750

6.1 Key Issues and Objectives

- Retire shortly with a comfortable level of secure, predictable retirement income for the rest of their lives, and avoid a situation in which they outlive their assets. The Schmitts consider themselves to be healthy and expect to live longer than the average life expectancy. They also state that they wish to make sure to maintain the purchasing power of their retirement income.
- Continue to provide ongoing financial support for Peter, raising the amount devoted to this purpose in 10 years to what they now estimate will need to be €35,000 per year at today's prices.
- Leave a meaningful but as yet unquantified inheritance for Roxane, over and above their residence.
- Help their daughter Roxane with the purchase of her first property in the very near future, up to €150,000.
- The Schmitts would also like to have the option to retire in another country.

6.2 Analysis of Retirement Assets and Drawdown Plan (1/2)

No need for life or disability insurance coverage; pension income amount known with certainty

Employer and private pension options

- Purchase annuities that would provide a stream of income for the rest of their lives
- Withdraw lump sums to use as they wish
- Leave the funds invested in the retirement schemes

Jessica's company pension	DC plan. Fund value of €350,000 corresponding to an annual pension of €17,500	→ Up to one-third can be withdrawn as a lump sum.
Paul's private pension savings plan	€135,000 corresponding to annual pension of €6,750	⇒ Option of using all or part of them to buy a stream of payments (an annuity) while withdrawing the rest as a lump sum.
Jessica's private pension savings plan	€175,000 corresponding to annual pension of €8,750	

6.2 Analysis of Retirement Assets and Drawdown Plan (2/2)

Lump Sum	Annuity
Beneficiary takes longevity risk	Annuity paid for main beneficiary's entire lifetime; residual rights for spouse
Flexibility	Ordinary retirement fixed-payment annuities guarantee a nominal amount of regular income
Tax is known Tax treatment varies across jurisdictions; in Eurolandia 25% can be withdrawn tax free	Tax liability cannot be fully estimated in advance
No counterparty risk	Counterparty risk

Example 12: Addressing longevity risk

Identify an option that would most likely address the Schmitts' concern about outliving their assets.

a Purchase annuities.

b Withdraw lump sums.

c Leave funds invested in the retirement plans.

6.3 Retirement Income Recommendations

Current expenditure level is 70,000

Exhibit 24 Retirement Income Proposal

€	
State pension Jessica	28,200
State pension Paul	48,950
Total pretax income from state pension	**77,150**
Annuity purchased using 75% of Jessica's company pension plan	11,800
Annuity purchased using 75% of Paul's private pension plan	4,600
Total pretax income from pensions/annuities	**93,600**
Less tax	21,600
After-tax income	**72,000**

Note: Assumes 4.5% annuity yield. Purchased annuities would provide inflation protection.

Take out 25% as lump sum → 121,250

Suggestion with respect to Jessica's private pension plan:

Take out 25% → 43,750. Leave the rest invested in the plan.

Moving to a Mediterranean County

The Schmitts are considering reducing their current living expenses by moving to a Mediterranean country, at the same time benefiting from the available tax break there. Stein provides them with a number of recommendations.

The prospect of retiring to another country has many financial and non-financial implications. It is necessary to consult with experts before making any decisions that are difficult or costly to reverse.

a A tax expert with up-to-date country knowledge must assess whether the claimed tax advantages really hold.

b There are estate planning implications, as it must be understood what the applicable laws are (those of the retirement country, those of Eurolandia, or a combination thereof) and the relevant tax regime for estate taxes.

c The option of moving back to Eurolandia, should the Schmitts wish or need to do so at a later stage, must be examined.

d If the target retirement country is not in Eurozone and hence does not use the euro (€), currency risk must be assessed and managed.

e Efficient and inexpensive arrangements must be made for money transfers and currency conversion (if currency conversion is needed).

f Provision of support for Peter must be assessed.

6.4 Investment Portfolio Analysis and Recommendations

Current situation:

- Investment portfolio = 1,511,000
- Tax-free pension lump sum = 165,000
- Jessica's private pension plan = 131,250

Total = 1.8 million

The main objectives for the portfolio are to do the following:

- Provide financial assistance for Peter—a top priority
- Leave an inheritance for the children, particularly Roxane
- Provide Roxane with a deposit for her house purchase in the very near future
- Be able to draw on the investment portfolio to cover unexpected expenses or if a need arises

Paul and Jessica explain that they:

- Do not want to see their overall investment portfolio fall in value by more than 20% in any given year
- Wish to invest in instruments that can easily be liquidated, because they like to feel that they are in control
- Worry about inflation despite Eurolandia's stability
- Do not wish to invest in real estate funds

6.5 The Advisor's Recommendations for Investment Portfolio in Retirement

Exhibit 26 Goals and Investment Portfolio as the Schmitts Enter Retirement

Existing Assets	Current Allocation	Goals	Time Horizon	Recommended Asset Allocation
Liquid funds (cash proceeds from pension lump sum)	€165,000	Help Roxane with property purchase deposit	<1 year	Keep funds in cash
Investment portfolio for long-term goals				
Inflation-protected government bond funds	€380,000	Care for Peter (PV of €800,000)	10 years	Inflation-protected government bonds 45% (€739,000)
Corporate bond funds	€370,000	Inheritance for Roxane (amount unspecified) and funding for unexpected expenses	Up to 25 years	Corporate bond funds 10% (€164,000)
Passively managed equity funds	€750,000			Global equities 35% (€575,000), including the actively managed equity funds in Jessica's private pension plan
Jessica's private pension plan	€131,250			Eurolandia equities 10% (€164,000)
Total	Approximately €1.8 million			

Note: In addition to these holdings, the Schmitts keep a cash balance of €85,000 in their bank account and do not expect this to change.

Summary

- Economic environment
- Family situation and circumstances
- Financial objectives
- Economic balance sheet
- Risk exposures
- Insurance calculations
- Goals-based planning
- Asset allocation
- Annuity versus lump sum