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# Case Study 5

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Aidan and Louise  
Gallagher

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CFP Examination Paper

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You are asked to meet with potential clients Aidan and Louise Gallagher. The meeting takes place in early January 2018. All asset values given are as at 31/12/2017.

Aidan and Louise Gallagher, new clients, have requested that a CFP® professional assist them in evaluating and planning the family's financial future.

Aidan is married to Louise, and they are both aged 45. The couple have two children, Laura and Finn, aged 18 and 10, respectively.

Aidan owns his own company, Gallagher Medical Devices Limited, from which he is currently drawing a salary of €120,000 per annum. Louise cares for the children, and also works part time with a local school, on an annual salary of €10,000. Aidan also owns an investment property in Dublin which provides additional income to the family.

Laura and Finn are in fulltime education. Laura has just started college on a four year course, with fees of €6,000 per annum. Finn is expected to go to college when he reaches 18 years of age.

The couple have a low risk tolerance.

### 1. Personal Information

<b>Name:</b>	Aidan	Louise
<b>Age:</b>	45	45
<b>Marital Status:</b>	Married	Married
<b>Health:</b>	Good	Good
<b>Occupation</b>	Company Director & Shareholder	Housewife; also works part-time
<b>Dependents</b>	<ol style="list-style-type: none"> <li>1. Laura, 18 – is financially dependent on her parents (college fees)</li> <li>2. Finn, 10 – is financially dependent on his parents</li> </ol>	

### 2. Economic & Tax Environment

Currently, the economy is challenging, but the medical sector continues to grow. Inflation and interest rates are currently low and are expected to remain low for the foreseeable future.

No changes to tax rates are expected in future years.

*Aidan* and *Louise* have asked that your advice on their retirement plans be framed ignoring Social Welfare entitlements. They prefer that their financial plans are based solely on the use of their own resources.

### 3. Client Objectives

1. To both retire at age 60. A budgeting exercise has indicated that they will require a net income of €50,000 in retirement. They have indicated to you that they intend selling the property and business on retirement.
2. *Aidan* and *Louise* wish to create an education fund to provide for their children's 3<sup>rd</sup> level education.
3. To reduce the term on their mortgage by so that it is cleared by retirement.
4. Aidan and Louise have indicated to you that they feel they have enough life insurance in place, and do not wish you to consider this area as part of your planning.

#### 4. Financial Information

- Aidan is the sole (100%) shareholder in Gallagher Medical Devices. The company was set up 5 years ago, and has been independently valued at €250,000. He currently earns a salary of €120,000 per annum as a director. He conservatively expects the company to be valued at €1.0 million (after tax) when he retires. He intends selling the company at aged 60.
- *Aidan* has shares with current market value of €100,000, which, if disposed of now would result in a capital loss of €30,000.
- *Aidan* has a personal pension fund of €60,000 but has not contributed to the fund in several years.
- *Louise*, currently on a salary of €10,000 per annum, has no pension.
- *Aidan* has life cover of €800,000, the detail of which is below.
- *Aidan* and *Louise's* domestic residence is valued at €700,000 and has an outstanding mortgage of 800,000. The mortgage is a capital and interest loan, and the rate is currently 4.1%. The couple have been advised that rate will increase to 4.5% from January 2018.
- As at 31 December 2017, Aidan and Louise have a joint bank account with a balance of €45,000 earning interest at an annual rate of 2.5% gross. The balance is unchanged since January 2017, and interest for the year-ended December 2017 is not included in the €45,000.
- *Aidan* and *Louise* intend selling the investment property assets at retirement as they would prefer not to have the hassle of managing the properties.
- Current lifestyle/living expenses are €3,500 per month. This is exclusive of life insurance costs. Current college fees are €6,000 per annum for Laura but are expected to rise with inflation

**5. Property Portfolio Detail – All Figures in € Euro**

	Owner	Location	Est Value as at 31/12/17	Loan Details	Annual Income	Lease
Commercial Property	Aidan	Dublin purchased in 2005 at a cost of €650,000	€400,000	€200,000 – term remaining 20 years – interest only; variable rate is 4.1%; principal to be repaid at maturity	€30,000	2 years into a 5-year lease
PPR	Joint	Purchased in 2005	€700,000	€800,000 – term remaining 18 years – capital and interest - variable rate is 4.1%;		

**6. Life Insurance Detail**

Life Insured	Owner	Beneficiary	Sum	Premium p.a.	Policy Type
Aidan	Aidan	Louise	€800,000	€2,200 p.a.	Whole of Life

**7. Long Term Asset Returns/Inflation/Interest Rates (pre-retirement)****Long Term Asset Returns**

	Yield	Capital Growth
Cash	1%	0%
Property		2%
Bonds	2%	1%
Equities	1.5%	7%

**Inflation**

Long term inflation expectation	2%
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**Interest Rates**

ECB Interest Expected To Remain At Current Levels

Using the Certified Financial Planner 6-step process, analyse *Aidan* and *Louise's* situation and make appropriate recommendations. Your answer should take the form of a 'Summary Financial Plan' which should include:

**REQUIRED – Part A**

1. A reflection of the clients' Current Position, including a Statement of Net Worth; an estimation of Income Tax; and a Statement of Current Cash-Flow;

**REQUIRED – Part B**

2. An evaluation of Aidan and Louise's stated objectives with a view to:
  - a. identifying the relevant issues associated with meeting those objectives
  - b. setting out your recommended solutions, including impact on cash-flows ( if necessary, conduct a trade off analysis)
  - c. identifying relevant risks, and making suitable recommendations to mitigate those risks

**Candidates should clearly state any assumptions made but should not apply assumptions that will materially alter the nature of this case.**

**REQUIRED – Part C**

You are now required to consider the Gallagher's circumstances at retirement (aged 65). Their Net Worth Statement now reads as follows:

Net Worth Statement at Retirement			
<b>ASSETS</b>		<b>LIABILITIES</b>	
Principal Residence	600,000	Mortgage	-
Cash - personal names	1,300,000		-
ARF - Cash	780,000		-
AMRF - Cash	240,000		-
	-		-
<b>Total Assets</b>	<b>2,920,000</b>	<b>Total Liabilities</b>	<b>-</b>
<b>Net Worth</b>	<b>2,920,000</b>		

**Notes to Net Worth Statement:**

- The cash held in their personal names is the proceeds, after tax and payment of loans, of the sale of their business and commercial property. It also includes the 25% tax-free lump-sums from their respective pension funds.
- The ARF and AMRF funds are also being held in cash pending advice.

**Client Objectives:**

- A recent budget exercise that the Gallagher's completed for you indicates that they will need a net annual income of €75,000 in retirement.
- The Gallagher's feel that they have sufficient wealth to be able to gift €200,000 to each of their children (Laura and Finn).
- In agreement with the clients, your calculations will be based on a time horizon of 25 years.
- Your risk questionnaire has identified that a worst-case nominal return of minus 10% in any 12 month period would be tolerable for the clients.

You are required to provide the Gallagher's with a suitable asset allocation strategy to meet their stated objectives. You are not required to consider the implementation of the strategy across assets held in personal names, Approved Retirement Funds and AMRFs.

**Assume that the portfolios are tax-neutral. In all instances the net tax take will be 30%.**

The table below provides details of 5 asset allocation strategies; A,B,C,D and E. You must choose the one you feel is most appropriate to the client’s needs and circumstances.

Asset Class	Projected	Expected	Tax	Portfolio A	Portfolio B	Portfolio C	Portfolio D	Portfolio E
	Total Return	Standard Deviation						
Cash	4.50%	2.50%	30.00%	10.00%	20.00%	25.00%	5.00%	10.00%
Corporate Bonds	6.00%	11.00%	30.00%	0.00%	25.00%	0.00%	0.00%	0.00%
Government Bonds	7.20%	10.80%	30.00%	40.00%	0.00%	30.00%	0.00%	30.00%
Large Cap Euro stocks	13.00%	17.00%	30.00%	20.00%	15.00%	35.00%	25.00%	5.00%
Small Cap Euro Stocks	15.00%	21.00%	30.00%	10.00%	10.00%	0.00%	15.00%	5.00%
International Stocks (US, Asia, Far-East)	15.00%	21.00%	30.00%	10.00%	10.00%	0.00%	15.00%	10.00%
Property	10.00%	15.00%	30.00%	10.00%	10.00%	10.00%	25.00%	35.00%
Private Equity	26.00%	64.00%	30.00%	0.00%	10.00%	0.00%	15.00%	5.00%
Long-term inflation	2.50%			100.00%	100.00%	100.00%	100.00%	100.00%
<b>Summary Portfolio Data</b>								
Nominal Expected Total Return				9.9%	11.0%	8.8%	14.4%	10.3%
Expected after-tax total return				7.0%	7.7%	6.2%	10.1%	7.2%
Expected Real after-tax returns				4.5%	5.2%	3.7%	7.6%	4.7%
Expected Standard Deviation				9.4%	12.4%	8.5%	18.1%	10.1%

**Please explain your choice under the following headings:**

- Time Horizon
- Risk Tolerance
- Return Objective
- Liquidity
- Risk-adjusted Performance and Diversification Evaluation

# Sample Solution

The following was identified as an acceptable solution to the Case Study. However this is not the sole acceptable answer, and it is recognised that alternative solutions might be produced that are acceptable.

Part A – Current Position

Part B – Pre-retirement Analysis and Recommendations

Part C – Post-retirement analysis

### **Assumptions - Part A**

- That long-term inflation will be 2% p.a.
- For the purpose of grossing up net retirement income, the clients effective tax rate at retirement is assumed to be 30%
- For the purpose of determining the discount factor for capitalising their post-retirement income needs, a growth rate of 4% is assumed on the management of assets post-retirement. This rate is not linked to the portfolios provided as part C of this case
- That the growth rate on pension funds (pre-retirement) will be 4% p.a.

**Part A – Current Position**

**1. Net Worth Statement as at 31/12/2018**

Net Worth Statement as at 1/1/2018												
Assets					Liabilities							
			Aidan	Laura	Joint	Combined			Aidan	Laura	Joint	Combined
<b>Non-Financial Assets</b>												
Primary Residence					700,000	700,000	Mortgage				800,000	800,000
												-
Total					700,000	700,000	Total					800,000
<b>Investment Property</b>												
Commercial Property			400,000	-	-	400,000	Loan	200,000			-	200,000
			400,000			400,000		200,000			-	200,000
<b>Investment Assets</b>												
Cash			-	-	45,000	45,000						
Accrued Interest			-	-	709	709						
Business Interest			250,000	-	-	250,000						
Pension Fund			60,000	-	-	60,000						
Share Portfolio			100,000	-	-	100,000						
			410,000	-	45,709	455,709						
<b>TOTAL ASSETS</b>						<b>1,555,709</b>	<b>TOTAL LIABILITIES</b>					<b>1,000,000</b>
<b>Net Worth</b>						<b>555,709</b>						
<b>Solvency Ratio (incl. business assets)</b>						<b>36%</b>						
<b>Solvency Ratio (excl. business assets)</b>						<b>20%</b>						
<b>Calculation 1 - Interest accrued for 2011</b>												
Deposit				45,000								
Interest rate				2.50%								
Gross Interest				1,125								
Less Dirt @ 37%				416								
Net Interest accrued				709								



**3. Estimated Cash-flow for 2018**

					<b>Finn</b>	
Years to college					8 years	
Inflation					2%	
Estimated costs currently					6,000	
Inflation-adjusted costs					7,030	
Years in College					4	
Discount Factor			<i>calc 8</i>		-1.3431%	
Lump-sum required at start of college					28,699	<i>Begin</i>
<u>Option 1 - Savings Plan</u>						
Gross deposit rate to be applied					1.00%	<i>Given</i>
Estimated Dirt					37%	
Net Interest rate					0.6300%	
Annual savings required					3,487.11	<i>Begin</i>
<u>Option 2 - Lump-sum investment</u>						
					27,293	
<b><u>Calculation 8 - Discount factor for education Fees</u></b>						
A.	Estimated deposit rate				1.00%	<i>Given</i>
B	Estimated Dirt				37%	
C	Net Interest rate				0.6300%	
D	Estimated Inflation Factor				2.00%	
E	Annual Discount Factor				-1.3431%	

Part B – Analysis and pre-retirement recommendations

**1. Objective 1 – Education Funding**

		<b>Finn</b>	
Years to college		8	years
Inflation		2%	
Estimated costs currently		6,000	
Inflation-adjusted costs		7,030	
Years in College		4	
Discount Factor	<i>calc 8</i>	-1.3431%	
Lump-sum required at start of college		28,699	
<u>Option 1 - Savings Plan</u>			
Gross deposit rate to be applied		1.00%	<i>Given</i>
Estimated Dirt		37%	
Net Interest rate		0.6300%	
Annual savings required		3,667	<i>Begin</i>
<u>Option 2 - Lump-sum investment</u>		27,665	

**Calculation 8 - Discount factor for education Fees**

A.	Estimated deposit rate	1.00%	<i>Given</i>
B	Estimated Dirt	37%	
C	Net Interest rate	0.6300%	
D	Estimated Inflation Factor	2.00%	
E	Annual Discount Factor	-1.3431%	

**2. Objective 2 – Accelerated Loan Repayments**

Current Balance	800,000	
Rate from Jan 2018	4.50%	
Current Term	18	years
Repayments from Jan 2018	64,927	

Objective is to clear the loan over 15 years

**Option 1 - Increase Monthly repayments**

New Term =	15	years
New Repayment =	73,439	
Increase in repayment amount =	8,512	annually

**Option 2 - Make a lump-sum payment now, maintaining current levels of repayment**

Current monthly repayments (@4.5%)	5,410.60
What level of borrowing can be supported by this level of repayment	707,274
Required Lump-sum to be paid today	92,726

**Option 3 - Pay a lump-sum at retirement**

Current monthly repayments	5,410.60
Years to retirement	15
Balancing of loan remaining to be paid at retirement	181,888

### 3. Objective 3 – Retirement Analysis

<b><u>In present day terms</u></b>					
Net Income required in today's value			50,000		
Estimated effective rate			30.00%	<i>An assumed rate</i>	
Gross Income required			71,429		
<b><u>Future Value of Gross Income Required at retirement</u></b>					
Years to retirement			15	<i>Given</i>	
Inflation Rate			2.00%	<i>Given</i>	
Income adjusted for inflation			96,133		
<b><u>Capital required to generate this income</u></b>					
To age 100			40		
Conservative Investment Returns			4.00%	<i>Assumed</i>	
Inflation			2.00%	<i>Given</i>	
Discount Factor			1.9608%		
Capital Sum required at 60 - based on DCF method			2,647,954		
Capitalisation using annuity factor			1.80%	<i>Tables</i>	
Capital required			5,340,747		
<b><u>Estimated Future Value of retirement assets</u></b>					
<b><u>Pension - Aidan</u></b>					
Investment Rate			4.00%		
Estimated Value at retirement			108,057		
<b><u>Proceeds from sale of company</u></b>					
Estimated Value at retirement			1,000,000		
<b><u>Proceeds from sale of property</u></b>					
Current Value			400,000		
Investment Rate			2.00%		
Estimated Value at retirement			538,347		
Purchase Price			650,000		
Capital gains Tax			nil		
Loan to be repaid			200,000		
Net Proceeds			338,347		
Estimated Future Value of assets set aside for retirement			1,446,404		
<b><u>Capital Shortfall in Retirement provisioning</u></b>					
Scenario			1		
Capital Required			2,647,954	<i>From 3</i>	
Shortfall in assets			1,201,550	<i>From 4 and 3</i>	
Required annual increase in retirement asstes @ 4%			60,007		
Scenario			2		
Capital Required			5,340,747	<i>From 3</i>	
Shortfall in assets			3,894,343	<i>From 4 and 3</i>	
Required annual increase in retirement asstes @ 4%			194,488		

**Estimated cost of Income protection**

	Aidan	Laura	
Salary	120,000	10,000	
Insured to 70%	84,000	7,000	
Less State Disability Payment	9,776	9,776	<i>Personal Rate</i>
Balance to be covered via PHI	74,224	-	
Cost of cover per 10,000 of income	389	495	<i>per tables - Age 50</i>
Cost of PHI	2,887	-	
Tax Relief	40%	40%	<i>Marginal rates</i>
Net cost to cash-flow	1,732	-	
Total Net Cost	1,732		

<b>Resources to be used:</b>			<b>Resources Required:</b>					
Cash	45,709		Cash-flow deficit	-	17,837			
Share Portfolio	100,000							
			Education Fund					
			a Savings Plan		3,487			
			b Set aside a lump-sum =		27,292			
			Income Protection		1,732			
			Clear debt by retirement		nil			
			a Increase Monthly Repayments		8,512			
			b Lump-sum payment now		92,726			
			c Lump-sum payment at retirement		181,888			
			<b>Retirement</b>					
			Shortfall requires annual accumulation					
			a Sinking Fund		60,007		per annum	
			b Annuity		194,488		per annum	

#### **4. Issues relating to the clients' current financial arrangements**

- The Gallagher's have a solvency ratio of 36%. At their stage of life, this is less than ideal, but is understandable in light of recent property devaluations. Excluding the value attributable to Aidan's business interests, the solvency ratio is 20%.
- The couple have a substantial annual cash-flow deficit of 17,837. This is clearly unsustainable and requires immediate attention. Failure to resolve this issue will result in the Gallagher's liquidating assets in order to sustain current lifestyle demands
- Analysis of the education fund requirement indicates that the clients will need to set aside the following resources:
  - €3,534 per annum if the fund is to be accumulated via a monthly savings regime. This position is based on the use of a deposit account as the savings vehicle, or
  - Setting aside a lump-sum amount of €27,665 into a deposit account.
- The Gallagher's desire to have their mortgage cleared by retirement is commendable. This would mean reducing the term of the mortgage by three years. The resources needed to achieve this are as follows:
  - Increase monthly repayments to 6,120. The effect on cash-flow of this option would be to increase the deficit by €8,512 annually.
  - Make a lump-sum payment against the loan now. The amount required is €92,726.
  - Continue with current repayment levels, with a view to clearing the outstanding balance at retirement with a lump-sum payment. The estimated amount required at retirement will be €181,888.
- Our analysis indicates that the Gallagher's will have a serious shortfall in the amount of assets required to fund their retirement. Using available annuity rates indicates that they need €5.3m in retirement assets. Using a sinking-fund approach (to age 100), they require a minimum of €2.6m. The estimated future value of assets ear-marked for retirement, including the company and commercial property, is €1,446,404. This leaves a shortfall of €1.201m/€3.894m against the target amount (depending on calculation methodology).
- In summary, the attainment of the Gallagher's objectives requires financial resourcing that is beyond their current capability. This may change into the future, however our advice is based on the current situation.

## 5. Recommendation

- Before dealing with the Gallagher's stated objectives, it is imperative that the cash-flow deficit is remedied. As it currently stands, they will use up their free cash over the next 2 years if the situation continues unchanged.

There are two possible solutions to this situation; increase income, or reduce expenses. Their main financial asset is Aidan's company. There is no evidence in the notes to suggest that there is any capacity to increase income beyond current levels. As there is a long-term lease on the commercial premises, there is no scope to review this source of income either. That leaves expenses.

Analysis of their cash-flow position indicates that the source of the couple's problems is their residential mortgage. Repayments account for 61.5% of their after-tax income.

The only way to reduce this substantial expense is to use capital to reduce the amount of the liability. Capital for this purpose could be accessed through one or more of the following; a sale of part of the business now, sale of the commercial investment property, downsizing of their residence, use of the share portfolio. The facts of the case do not allow consideration of a partial sale of the business.

Key to correcting this problem is the clients' willingness to consider a downsizing of their residence. This is an emotive decision, however from a financial perspective the scale of their deficit is such that it will exhaust some of their other assets in order to service the debt, and the problem will still be unresolved. There are several options available to the clients in relation to the debt on their residence;

1. Sell the house, and downsize. This would have the effect of reducing the debt dramatically. Although a largely emotive issue, the financial situation is so dire as to require consideration at this point,
2. Extend the term of the loan. This would reduce their current monthly repayments, however the scale of the deficit is such that this is not a realistic option.
3. Seek a conversion to an interest-only facility. This would reduce their monthly repayments to €3,000 on the assumption that the bank would grant the same rate (4.5%). This would have the effect of removing their cash-flow deficit, but it would not provide any surplus. Given their stage of life, I think it inadvisable to delay resolving this particular issue.

4. Another consideration might be splitting the loan into two elements, one of which can be repaid now, the other parked for some years before repayments kick in. However, as it likely that the split loan would be repaid from retirement monies, I believe this to be an unsatisfactory option in this case.
5. Sell the commercial property. The impact on cash-flow would be to increase the deficit by a further €11,118, calculated as follows:
 

❖ Reduction in Gross Income	=	(30.000)
❖ Reduction in Income Tax	=	10,682
❖ Reduction in Loan repayments	=	8,200
❖ Net impact on cash-flow	=	(11,118)

If the proceeds of the sale, after paying off debt, were applied to the mortgage on the residence, then it would reduce the outstanding loan to €600,000. Repayments, calculated on a 15 year term, would be €59,669. This would reduce the cash-flow deficit by €5,258 which is inconsequential given the scale of the deficit.

Taking the facts of the case, and considering the available options, I am recommending to the clients that they need to reduce the cost of their residential mortgage by downsizing. This could be in conjunction with the possible sale of the commercial property, but as it has a significant positive cash-flow I am advising that it be retained towards their retirement planning.

The costs of servicing the residential mortgage will need to be reduced by circa €20,000 (*to allow for cost of Income Protection P20*) in order correct the deficit. That means that the maximum annual repayments should be circa €45,000, or €3,750 per month. On this basis, and using the prevailing loan rate of 4.5% over a 15 year term, the maximum loan that the Gallagher's should have is €490,200. Note, that there would be a hangover of €100,000 of negative equity arising from the sale which would need to be allowed for. The restructure would also be conditional on lender support.

This could be augmented by the addition of the balance of the share portfolio (see point below in relation to education fund) towards the purchase of a new home. This would allow the Gallaghers to acquire a property for circa €560k, including related fees.

Down-sizing would correct the cash-flow deficit, and also correct the clients' objective to have their mortgage cleared by age 60.

- As all of Aidan and Louise's objectives are dependent on their continued ability to generate earned income; it is essential that this is protected in the form of income protection insurance. The annual premiums will cost 2,887 (*ref p16*), although tax relief is available at marginal rate of 40%, meaning a net cost to cash-flow of €1,732.
- As Aidan is self-employed, it makes sense for the couple to retain an emergency fund to cover 6 months spending requirements. The deposit of €45,000 has been set aside for this purpose.
- The clients do not have the resources to create a monthly savings plan for their son Finn's education fund. However, as it will be 8 years before he starts college, it should be possible to set aside €27,298 (refer p13) from the share portfolio towards this objective. However, this strategy will need to be revisited regularly, and a number of years out from the start of college, the capital so set aside should be switched to a less volatile deposit environment.
- Resolving the Gallagher's retirement planning objective is more problematic. They clearly do not have the resources to accumulate the required level of wealth for their desired level of retirement income. This may change into the future, primarily if the company proves more successful than planned.

That being said, the couple are very dependent on the future planned sale of the business. If this does not materialise, then their already scant retirement assets will be severely depleted, resulting in radical change to their retirement plans.

As it stands, the couple may need to consider postponing their retirement plans to age 65. This would allow them more time in which to accumulate the necessary assets for retirement. The impact of delaying their retirement by 5 years would be (see details on page 22):

- ❖ On a sinking fund basis, and using to age 100, the clients would have a deficit of €700k / €1.2m depending on the method used.
- ❖ Factors that might enhance this position in the future include:
  - In 4 years their daughter will have completed third level education, freeing up circa €6,000 in annual expenses which can be re-directed towards retirement planning.

- In 15 years the mortgage will be cleared, freeing up circa €35,000 in annual expenses
- The business may prove more successful than envisaged, which might allow for the possibility of the company making pension contributions, and also may generate a higher sale price.

Finally, Aidan should consider making Louise a proprietary director of the business to ensure that as value is built it can be released to the couple in the most tax-efficient way possible. This would involve availing of retirement relief on the eventual sale of the business, and if practical, some form of company pension planning. It should also allow them to access the full 20% tax threshold for a married couple with two salaries.

<b>Retirement Analysis on the basis of retirement age 65</b>			
<b><u>In present day terms</u></b>			
	Net Income required in today's value	50,000	
	Estimated effective rate	30.00%	
	Gross Income required	72,993	
<b><u>1 Future Value of Gross Income Required at retirement</u></b>			
	Years to retirement	20	<i>Given</i>
	Inflation Rate	2.00%	<i>Given</i>
	Income adjusted for inflation	108,464	
<b><u>3 Capital required to generate this income</u></b>			
a	Life Expectancy at age 65	30	
	Conservative Investment Returns	4.00%	<i>Assumed</i>
	Inflation	2.00%	<i>Given</i>
	Discount Factor	1.9608%	
	Capital Sum required at 65 - based on DCF method	2,442,354	
b	Capitalisation using annuity factor	3.60%	<i>at age 65</i>
	Capital required	3,012,882	
<b><u>4 Estimated Future Value of retirement assets</u></b>			
a	<b>Pension - Aidan</b>		
	Investment Rate	4.00%	
	Estimated Value at retirement	131,467	
b	<b>Proceeds from sale of company</b>		
	Estimated Value at retirement	1,216,653	<i>Assumes 4% p.a. growth for last 5 years</i>
c	<b>Proceeds from sale of property</b>		
	Current Value	400,000	
	Investment Rate	2.00%	
	Estimated Value at retirement	594,379	
	Purchase Price	650,000	
	Capital gains Tax	nil	
	Loan to be repaid	200,000	
	Net Proceeds	394,379	
	Estimated Future Value of assets set aside for retirement	1,742,499	
<b><u>5 Capital Shortfall in Retirement provisioning</u></b>			
	Scenario	1	
	Capital Required	2,442,354	<i>From 3</i>
	Shortfall in assets	699,854	<i>From 4 and 3</i>
	Required annual increase in retirement asstes @ 4%	23,502	
	Scenario	2	
	Capital Required	3,012,882	<i>From 3</i>
	Shortfall in assets	1,270,383	<i>From 4 and 3</i>
	Required annual increase in retirement asstes @ 4%	42,662	

**Risks to the plan**

- That interest rates will rise substantially in future years, exacerbating cash-flow problems
- That projected growth rates are not met
- That high inflation returns to the economy
- That the income tax regime changes so that a higher percentage of income tax is taken from the couple, again exacerbating cash-flow problems
- That the business does not prove successful, which would jeopardise all of the clients plans
- That it may not be possible in the prevailing depressed market to sell their residential property.
- If the property is sold, then the clients would need to be granted a smaller mortgage to enable them to purchase a new home.

**Conclusion of pre-retirement aspect of the case study**

## Part C – Post Retirement Analysis

### **Additional calculations**

	A	B	C	D	E
Sharp Ratio (Exp. Return - Risk-free over St Dev)	0.578	0.520	0.510	0.546	0.575
Worst Case Scenario (Expected return - 2 x St Dev)	-8.9%	-13.9%	-8.2%	-21.8%	-9.9%

### **Time Horizon**

The Gallagher's are now aged 65. Life Expectancy, as a couple is 20 years. However, as this is an average, it would be prudent to base recommendations on a longer time horizon. The determination of a suitable time horizon has implications for determining the required rate of return. The longer the time horizon, the higher the Return Objective will need to be. In this case, a time horizon of 25 years has been agreed as a suitable duration for the determination of the asset allocation.

### **Risk Tolerance**

Given their stage of life, the Gallagher's risk tolerance is on the low side due to the inability to re-generate wealth. Balancing this is their investment time horizon which is 25 years.

The Portfolio Expected Returns less two times the portfolio risk (expected standard deviation) is a reasonable baseline measure of shortfall risk. If the resulting number is above the client's threshold return level, the criterion is met.

In this case only portfolios A, C and E meet the Gallagher's requirements.

### **Return Objective**

The Gallagher's available investment assets are €2,120,000 after deducting from their net worth the value of their residence and the gifts to their children.

Their required net income in retirement is €75,000. One approach to calculating their investment return objective is to divide their net income by their net worth = 3.5%. Allowing for tax on income at 30%, the gross pre-tax target rate of return is 5.0%. Adding the rate of inflation (2.0%) gives a target return of 7.0%. On this basis, the Gallagher's will not deplete their capital over the 25 year time horizon. Each of the three remaining portfolios meet this return objective.

**Risk-adjusted Performance and Diversification Evaluation**

Portfolios A and E have similar Sharpe ratios and expected real-after-tax returns. Both A and E have large exposure to Bonds. Portfolio E, however, has a large position in Property. Portfolio A contains a larger allocation to a diversified portfolio of large- and small-cap Euro stocks. Portfolio A therefore provides greater diversification through its equity representation as opposed to the specialised nature of property. Portfolio C provides similar diversification benefits, although its Sharpe Ratio is less than A and E's

Furthermore, because of the greater certainty of data for the equity markets, we can be more certain that the return and risk objectives for portfolio's A and C will be met.

On the basis of risk-adjusted performance and portfolio diversification, portfolio E is removed, leaving portfolios A and C for final consideration.

**Liquidity**

As the Gallagher's will be drawing a regular income, it is necessary that the portfolio provides them with liquidity. Of the remaining two portfolios C has a greater weighting to Cash and Bonds.

Portfolio C is therefore the preferred portfolio as it meets the Gallagher's Return objectives; their maximum risk tolerance objective; their liquidity needs; and offers good risk-adjusted performance and diversification.

