



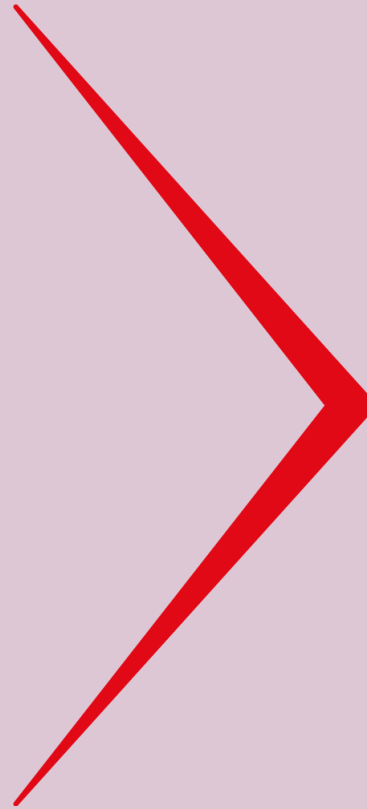
# ***Business Planning: Insurance Conference 2021***

**EXAMINERS' DEBRIEF AND GUIDANCE – PART 2**

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# ***Contents***

- Bonds, interest rate risk and duration
- EU withdrawal
- Sample script marking



***Bonds, interest rate  
risk and duration***

# ***What we are looking for***

- A good grasp of bond fundamentals
  - Clear understanding of a bond's features eg. coupon vs yield, price vs nominal
  - Inverse relationship of price vs yield/interest rate
- A solid understanding of interest rate risk
  - How it arises
  - How it can be measured
  - What is duration and how it can be used in risk management
- Simple recommendations reliant on the above
  - How to increase/decrease risk
  - How to change duration
  - Balancing the relationship between asset and liability risk using duration
- Not expecting complex mathematical analysis
  - Simple changes in yield curve only

# ***What we get***

- Some candidates scripts do demonstrate these things, but
- Some candidates are unconvincing
  - Not using the tools at their disposal to address the problem
  - Oversimplification eg. bonds safe, equities risky
  - Reacting to key words with definitions and pre-prepared answers rather than application
  - Getting fundamentals manifestly wrong e.g. rates increase and bond price up
- Examples of this not uncommon in December 2020 exam
  - Will see some of this later

# ***How we can help***

- Bonds and interest risk need to be looked at from several perspectives, for example,
  - Interest rate gives rise to capital risk for a fixed income bond
  - A change in interest rate risk makes fixed bond cashflows relatively more/less attractive
  - These are two views of the same relationship (not uncommon to see these described these as different risks)
- Candidates who can reconcile these different views likely to perform better

# ***Bonds: Income vs capital risk***

- Firstly, assume bond cash flows are certain – no credit risk (gilts)
- Fixed income bonds = capital risk and no income risk
  - Candidates sometimes describe the fixed nature of coupon as income risk
- Floating rate bonds = income risk and no capital risk (at rate reset points)
- Insurers want funds invested to grow at a predictable rate to meet liabilities
  - So they don't want income risk or capital risk at the point the liability arises
  - Assuming that the future liabilities are determinable in nominal terms
  - Candidates often seem to be unclear what risks insurers should be concerned about
- Therefore fixed rate bonds held to maturity attractive for (life) insurers
  - Offering a 'locked in' yield to maturity (will come back to reinvestment risk)
  - Enables the removal of uncertainty about the ability to meet future liabilities

# ***Asset-Liability matching***

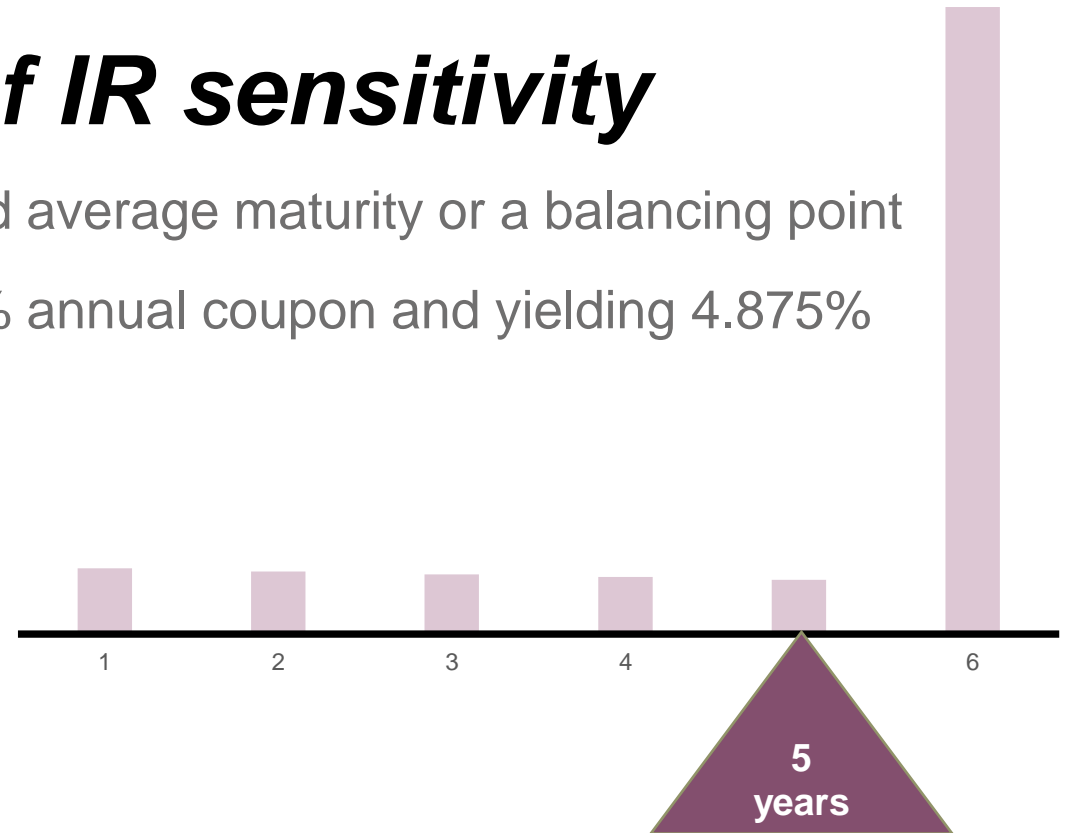
- At its very simplest buy an instrument offering a certain future cash inflow = projected outflow
  - Eg. liability of £100k in 10 years, buy £100k nominal of 10 year zero coupon bond
  - No risk of failing to meet liability (still assuming no credit risk)
  - Also changes in present value of asset and liability in response to yields changes will perfectly offset
  - So in this case these 2 things – capital/value risk and risk of not meeting future liability are basically the same
- Clearly for an insurer things get more complicated
  - More complex pattern of expected cash outflows
  - Backing a portfolio of liabilities with a portfolio of assets
  - Conventional bonds have income which needs to be reinvested at the discount rate (GRY)
- Need a tool to measure interest rate risk (capital) in relation to assets and liabilities = duration
- Scripts give impression that duration is not understood particularly well
  - Weaker candidates reproduce the definition, but appear to lack understanding
  - It is a more complex topic, but we are only asking for a relatively basic understanding



# Duration as a measure of IR sensitivity

- Duration can also be thought of as a weighted average maturity or a balancing point
- Assume £100 nominal of 6 year bond with 9% annual coupon and yielding 4.875%

Time	Cash flows	PV	PV x T
	£	£	£
1	9	8.58	8.58
2	9	8.18	16.37
3	9	7.80	23.41
4	9	7.44	29.76
5	9	7.09	35.47
6	109	81.92	491.53
		121.02	605.11
<b>Duration = 5 years</b>			



- Link to the sensitivity of value to rate changed through modified duration
  - $\% \Delta \text{ bond value} = \Delta \text{GRY} \times [\text{duration} / (1 + \text{GRY})]$
- Above assumes a linear relationship tangential to the actual convex one – convexity
  - Only an awareness of convexity expected

# ***Duration matching***

- If duration of liabilities = duration of assets = immunised
  - Candidates need to know what this means and how it can be achieved
- Duration of assets – duration of liabilities = duration gap – if zero = immunised
- Many candidate state these facts, but few actually explain what they mean in context
  - Essentially that an insurer is hedged against interest rate risk
  - For BP:I we only really consider general changes in yield not changes in shape of the yield curve
- Two ways to look at this hedge
  1. Changes in value of assets and liabilities in response to IR changes offset (incremental only as duration changes)
  2. Or, to put it another way, insurer protected against the effect of IR changes on ability to meet future liabilities
- If we intend to use a bond to meet a cash flow two things could affect this (no credit risk)
  1. The value of the bond when it is realised
  2. Any gain or loss from reinvesting income

# ***Reinvestment vs capital risk***

- Imagine we have just one liability in exactly 5 years of £153.54
- To immunise we could buy a bond with a 5 year duration
- Conveniently, we were just looking at one! - 6 year maturity, 9% coupon, yielding 4.875%
- So let's discount back the future cashflow to identify how much we need to invest
- $£153.54/1.04875^5 = 121.02$
- Looking back this was the price of £100 nominal (doesn't have to be - just making life easy!)
- Now we can be confident that we can definitely meet liability of £153.54
  - This bond holding including reinvested income will be worth £153.54
  - Even if change in interest rates occurs can meet liability

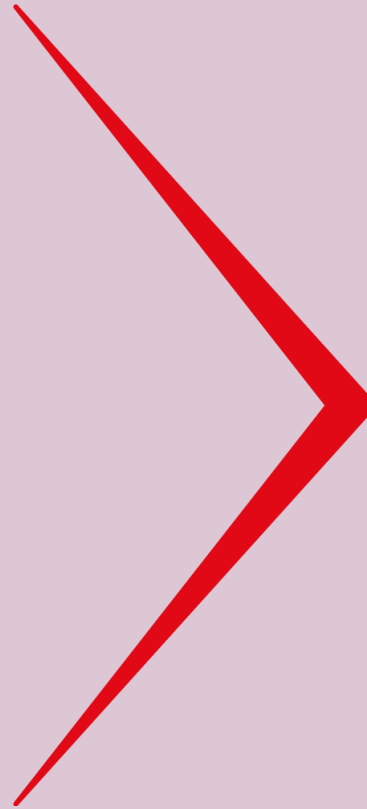
# Numerical demonstration – rate falls to 3%

At 4.875%				At 3%					
Time	Cash flows £	CF/DF 4.875%	Value T5	Time	Cash flows £	CF/DF 3%	Value T5 £		
1	9	1.2097	10.8876	1	9	1.1255	10.1296		
2	9	1.1535	10.3815	2	9	1.0927	9.8345		
3	9	1.0999	9.8989	3	9	1.0609	9.5481		
4	9	1.0488	9.4388	4	9	1.0300	9.2700		
5	9	1.0000	9.0000	5	9	1.0000	9.0000		
6	109	0.9535	103.9333	6	109	0.9709	105.8252		
								gain/(loss)	
Reinvested income			49.6067				47.7822	-1.8244	
Realisation proceeds			103.9333				105.8252	1.8920	
Cash to meet liab			153.5399				153.6075	0.0676	

- Reinvestment risk and capital risk offset at the 5 year point
  - There was no duration gap between asset and liability
  - Duration gap can be viewed in terms of the relationship between reinvestment risk and price risk
- In fact, the two effects don't quite offset each other due to convexity
  - Why we need to periodically rebalance the duration matching

# ***Application to portfolios***

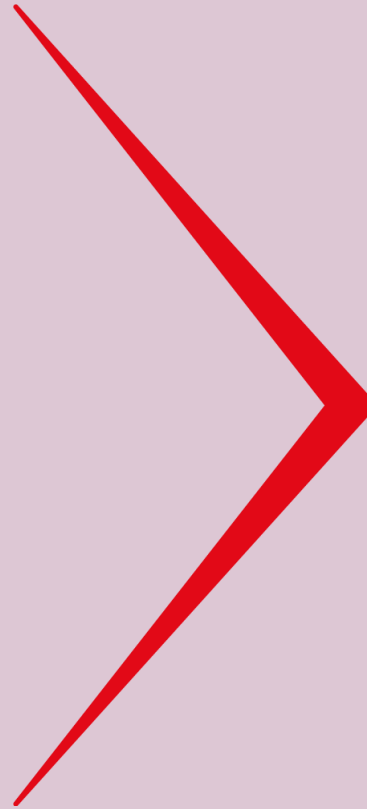
- We've only looked at this in terms of a single bond and a single cash flow
- Insurers are dealing with complex portfolios of bonds and liabilities
- Basic principles hold true as each portfolio is just a (more complex) pattern of cash flows
  - Portfolio duration is average of constituent durations weighted by value
  - When candidates were provided with info to work out portfolio duration very few did so eg. Q3 J18, Q2 S20



***EU withdrawal:  
regulatory  
implications***

# ***Impact on 2020 BP:I examinations***

- At time of writing the LMs much was still uncertain
- We now know how things will work post-withdrawal (sort of)
- Short story is little change in the short term
  - EU regulatory regime 'onshored' by European Union (Withdrawal) Act 2018 and associated legislation
  - Solvency II still applicable to UK insurers
  - Role of EU regulators reverts to PRA/FCA
  - EU passporting ended, but PRA has created the 'temporary permissions regime' in which previously passported firm can seek UK authorisation (or transfer their insurance business)
- Onshored regime suboptimal, Treasury & regulators working on Future Regulatory Framework
  - Back to an FSMA model with clear roles for parliament/treasury/regulators
- These issues **not** going to feature significantly in 2021 exams

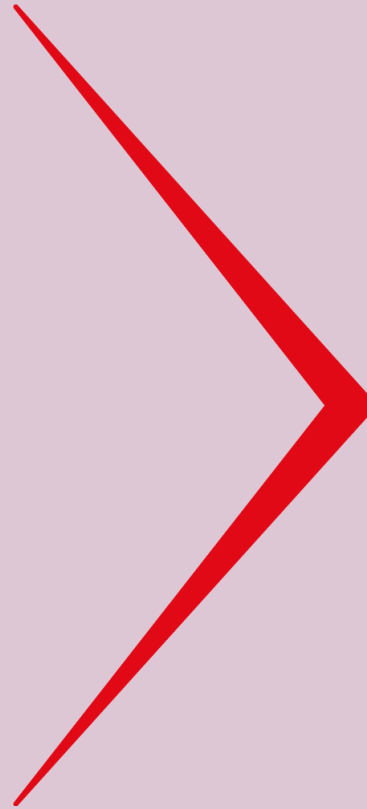


***Marking of sample  
scripts from  
December 2020***



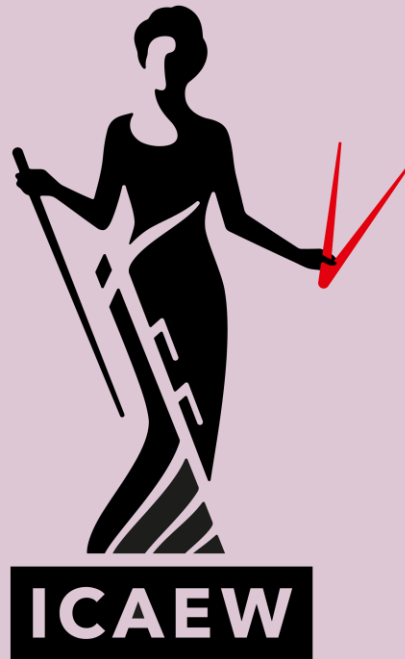
# ***Key themes***

- Little correlation between volume and quality
- Appropriate structure aids clarity and also seems to improve candidate focus
- Links between related parts of solution should be clear, eg. risks/procedures, ethical issues/actions
- Good answers address the requirement and apply knowledge to information provided
- Candidates should take care with time on IFRS 17 numerical requirements – diminishing returns



# Q&A

Own beverage and biscuits!



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