Schweser Printable Answers - Session Asset Valuation: Fixed Income Investments:
Structured Securities

Test ID#: 1361239

Back to Test Review | Hide Questions | Print this Page

Question 1 - #25334 Paul Wilken works in the structured product group of a large investment bank. One of his new tasks is to perform valuation analysis on mortgage-backed (MBS) and asset-backed securities (ABS). Wilken needs to familiarize himself with the many measures used to value these types of securities.

Part 1)
The first valuation metric that Wilken is to explore is the *cash flow yield*. Wilken would like to determine the strengths and weaknesses of the cash flow yield. Which of the following assumptions is **NOT** a limitation of the cash flow yield measure?

A) The credit risk associated with the underlying loans is constant over the life of the security.
B) The computation includes an assumption about the default rate of the underlying loans.
C) Similar to the yield to maturity measure all interim cash flows are reinvested at the cash flow yield.
D) The mortgage-backed or asset-backed securities are held until the final payout based on some prepayment assumption.

Your answer: A was incorrect. The correct answer was A) The credit risk associated with the underlying loans is constant over the life of the security.

The cash flow yield measure does not rely on any credit risk assumption.

Part 2)
Wilken now turns his attention to the *nominal spread*. Once again he is interested in the strengths and weaknesses of the valuation metric. Which of the following is a limitation of the nominal spread?

The nominal spread:

A) does not account for inflation.
B) is not adjusted for interest rate risk.
C) contains no adjustment for prepayment risk.
D) can only be computed using Monte Carlo simulations.

Your answer: A was incorrect. The correct answer was C) contains no adjustment for prepayment risk.

The nominal spread does not properly capture the prepayment risk associated with these securities.

Part 3)
Wilken has some experience using interest rate lattice models to price interest rate derivatives. He has read that the *lattice based backward induction method* cannot be used to value mortgage-backed securities (MBS). Which of the following is a reason why this is the case?

The lattice based backward induction method is difficult to use because of:

A) prepayments.
B) default risk.
C) variable interest rates.
D) the path dependency of cash flows.

Your answer: A was incorrect. The correct answer was D) the path dependency of cash flows.

Prepayments depend on the level of the interest rate at a particular point in time and also on the path the interest rate has taken in order to get to a certain level. Backward induction can't easily capture path dependent cash flows.

Prepayments can be incorporated in a model that uses backward induction.

Part 4)
Wilken wants to use *Monte Carlo simulation* in order to value agency passthrough securities. Why must adjustments be made to interest rate paths of the Monte Carlo simulation model?

Adjustments must be made to:

A) prevent defaults.
B) ensure that the correct prepayments are included.
C) produce a model that is computationally tractable.
D) produce the requisite no-arbitrage property.

Your answer: A was incorrect. The correct answer was D) produce the requisite no-arbitrage property.

The user must adjust the interest rate paths so that the model retains a no-arbitrage with market values.

Part 5)
Wilken turns his attention to interest rate sensitivity measures. In particular he wants to know why there are differences in *effective duration* quotes between dealer firms. Which of the following is **NOT** a reason why there exist differences in the effective duration measures in the mortgage-based security (MBS) and asset-backed security (ABS) markets?

Suppliers of effective duration quotes use different:

A) prepayment models.
B) convexity estimates.
C) option-adjusted spreads.
D) interest rate volatility.

Your answer: A was incorrect. The correct answer was B) convexity estimates.

The convexity metric is not needed to compute the effective duration.

Part 6)
Wilken is aware that there are different methods to value an asset-backed security (ABS). When should an ABS be valued using the zero-volatility spread approach?

A) When the ABS does not have a prepayment option or the prepayment option is unlikely to be exercised.
B) When there is no default risk.
C) When the default risk is constant over the life of the ABS.
D) When the ABS has a prepayment option that is likely to be exercised.

Your answer: A was incorrect. The correct answer was A) When the ABS does not have a prepayment option or the prepayment option is unlikely to be exercised.

This approach does not consider any prepayment option.

Question 2 - #40386

The Calgary Institute Pension Fund includes a $65 million fixed-income portfolio managed by Cara Karstein, CFA, of Noble Investors. Karstein is asked by Calgary to provide an analysis of the interest rate risk of the bond portfolio. Karstein uses a binomial interest rate model to determine the effect on the portfolio of a 100 basis point (bp) increase and a 100 basis point decrease in yields. The results of her analysis are shown in the following figure.

Par Value	*Security*	*Market Value*	*Current Price*	*Price If Yield Change*	
				Down 100 bp	*Up 100 bp*
$25,000,000	4.75% due 2010	$25,857,300	105.96	110.65	101.11
$40,000,000	5.85% due 2025	$39,450,000	98.38	102.76	93.53

$65,000,000	Bond portfolio	$65,307,300			

At a subsequent meeting with the trustees of the fund, Karstein is asked to explain what a binomial interest rate model is, and how it was used to estimate effective duration and effective convexity. Karstein is uncertain of the exact methodology because the actual calculations were done by a junior analyst, but she tries to provide the trustees with a reasonably accurate step-by-step description of the process:

Step 1: Given the bond's current market price, the Treasury yield curve, and an assumption about rate volatility, create a binomial interest rate tree and calculate the bond's option-adjusted spread (OAS) using the model.
Step 2: Impose a parallel upward shift in the on-the-run Treasury yield curve of 100 basis points.
Step 3: Build a new binomial interest rate tree using the new Treasury yield curve and the original rate volatility assumption.
Step 4: Add the OAS from Step 1 to each of the 1-year rates on the tree to derive a "modified" tree.
Step 5: Compute the price of the bond using this new tree.
Step 6: Repeat Steps 1 through 5 to determine the bond price that results from a 100 basis point decrease in rates.
Step 7: Use these two price estimates, along with the original market price, to calculate effective duration and effective convexity.

Julio Corona, a trustee and university finance professor, immediately speaks up to disagree with Karstein. He claims that a more accurate description of the process is as follows:

Step 1: Given the bond's current market price, the on-the-run Treasury yield curve, and an assumption about rate volatility, create a binomial interest rate tree.
Step 2: Add 100 basis points to each of the 1-year rates in the interest rate tree to derive a "modified" tree.
Step 3: Compute the price of the bond if yield increases by 100 basis points using this new tree.
Step 4: Repeat Steps 1 through 3 to determine the bond price that results from a 100 basis point decrease in rates.
Step 5: Use these two price estimates, along with the original market price, to calculate effective duration and effective convexity.

Corona is also concerned about the assumption of a 100 basis point change in yield for estimating effective duration and effective convexity. He asks Karstein the following question: "If we were to use a 50 basis point change in yield instead of a 100 basis point change, how would the duration and convexity estimates change for each of the two bonds?"

Karstein responds by saying, "Estimates of effective duration and effective convexity derived from binomial models are very robust to the size of the rate shock, so I would not expect the estimates to change significantly."

Part 1)
Which of the following statements is *most* accurate?

A) The two methodologies will result in the same effective duration and convexity estimates only if the same rate volatility assumption is used in each and the bond's OAS is equal to zero.
B) Karstein's description is a more accurate depiction of the appropriate methodology than Corona's.
C) The two methodologies will result in the same effective duration and convexity estimates only if the same rate volatility assumption is used in each.
D) Corona's description is a more accurate depiction of the appropriate methodology than Karstein's.

Your answer: A was incorrect. The correct answer was B) Karstein's description is a more accurate depiction of the appropriate methodology than Corona's.

Karstein correctly outlined the appropriate methodology for using a binomial model to estimate effective duration and effective convexity. Corona fails to adjust for the option-adjusted spread (OAS) and, instead, simply adds 100 basis points to every rate on the tree rather than shifting the yield curve upward and then recreating the entire tree using the same rate volatility assumption from the first step. Even if both use the same rate volatility assumption, and the OAS is equal to zero, the two methodologies will generate significantly different duration and convexity estimates.

Part 2)
Assume that the effective convexity of the 4.75 percent 2010 bond is 3.45. The effective duration of the 4.75 percent 2010 bond and the percentage change in the price of the bond for an 80 basis point decrease in the yield

are *closest* to:

	Effective Duration	% Change in Bond Price
A)	4.58	+1.79%
B)	4.50	+3.62%
C)	4.21	+2.09%
D)	4.38	+2.09%

Your answer: A was incorrect. The correct answer was B)
4.50 +3.62%

$$ED = \frac{110.65 - 101.11}{2 \times 105.96 \times 0.01} = 4.50$$

$$\%\Delta BV \approx (-4.50 \times -0.008 \times 100) + (3.45 \times -0.008^2 \times 100) = 3.62\%$$

Part 3)
The convexity of the 5.85 percent 2025 bond for a 100 basis point change in rates is *closest* to:

A) -12.18.
B) 3.57.
C) -23.88.
D) 18.90.

Your answer: A was incorrect. The correct answer was C) –23.88.

$$EC = \frac{102.76 + 93.53 - (2 \times 98.38)}{(2 \times 98.38 \times 0.01^2)} = -23.88$$

Part 4)
Assume that the duration of the 5.85 percent 2025 bond is 2.88. The duration of the portfolio is *closest* to:

A) 3.01.
B) 3.12.
C) 4.44.
D) 3.52.

Your answer: A was incorrect. The correct answer was D) 3.52.

$$\begin{aligned} D_{portfolio} &= 4.50\left(\frac{25,857,300}{65,307,300}\right) + 2.88\left(\frac{39,450,000}{65,307,300}\right) \\ &= 4.50(0.3959) + 2.88(0.6041) \\ &= 3.52 \end{aligned}$$

Part 5)
In regard to the effect of a change in the size of the rate shock on the duration and convexity estimates, Karstein is:

A) correct only in her analysis of the effect on the 4.75% 2010 bond.
B) incorrect in her analysis of the effect on both bonds.
C) correct only in her analysis of the effect on the 5.85% 2025 bond.
D) correct in her analysis of the effect on both bonds.

Your answer: A was incorrect. The correct answer was A) correct only in her analysis of the effect on the 4.75% 2010 bond.

Duration and convexity estimates for bonds without embedded options will not be significantly affected by changing the size of the rate shock from 100 basis points to 50 basis points. However, for bonds with embedded options, the size of the rate shock can have a significant effect on the estimates.

We know from Part 3 that the 2025, 5.85% bond exhibits significant negative convexity, which is consistent with a callable bond. The 2010, 4.75% bond has positive convexity, even when yields are significantly below the coupon rate and the bond is trading at a substantial premium. That suggests the 2010, 4.75% bond has no embedded options.

We would expect that changing the size of the rate shock would have a significant effect on the 2025, 5.85% callable bond, but not on the 4.75% 2010 bond. Therefore, Karstein is correct in her analysis of the 4.75% bond, but not the 5.85% bond.

Part 6)
The portfolio convexity adjustment, assuming a 100 basis point decrease in yield, is *closest* to:

A) +1.77%.
B) -2.93%.
C) -1.77%.
D) +2.93%.

Your answer: A was incorrect. The correct answer was A) +1.77%.

$$\text{duration effect} = -3.52 \times -0.01 \times 100 = 3.52\%$$
$$\text{value of } 4.75\% \text{ bond} = \$25{,}000{,}000 \times 110.65\% = \$27{,}662{,}500$$
$$\text{value of } 5.85\% \text{ bond} = \$40{,}000{,}000 \times 102.76\% = \$41{,}104{,}000$$
$$\text{portfolio value} = \$27{,}662{,}500 + \$41{,}104{,}000 = \$68{,}766{,}500$$
$$\text{total effect} = \frac{\$68{,}766{,}500}{\$65{,}307{,}300} - 1 = 5.30\%$$
$$\text{convexity adjustment} \approx 5.30\% - 3.52\% = +1.77\%$$

Question 3 - #9331

Paul Wilken works in the structured-product group of a large investment bank. One of his new tasks is to perform valuation analysis on mortgage-backed and asset-backed securities. Wilken has not worked with MBS or ABS in several years, so he takes some time to reacquaint himself with the many measures used to value these types of securities.

Wilken begins with the cash flow yield. He believes the cash flow yield is of little use in real-life situations. He records the following assumptions of the cash flow yield.

- All cash flows will come in on schedule.
- All interim cash flows are reinvested at the cash flow yield.
- Default risk associated with the underlying loans is constant over the life of the security.
- Mortgage-backed or asset-backed securities are held until the final payout.

Wilken then turns his attention to the nominal spread, which he finds more useful than the cash flow yield.

After reviewing the basics, Wilken begins work on his valuations. He has some experience using interest-rate lattice models to price interest-rate derivatives. However, he has read that the lattice-based backward-induction method cannot be used to value mortgage-backed securities (MBS). Instead, he considers the merits of zero-volatility spreads and Monte Carlo simulations.

Wilken begins his bond-valuation assignment by considering two securities – a bond backed by credit-card loans, and a bond backed by home-equity loans.

Wilken assigns a junior researcher, Michelle Zoellick, to help with his bond valuations. Her first job is to determine the effective durations of a series of bonds. Zoellick soon realizes that all of the dealers used by the investment bank provide different estimates for effective duration. She tries to determine why this is so, and concludes that the numbers are not equal because vendors use different assumptions for:

- Prepayment assumptions.
- Option-adjusted spreads.
- Credit risk.
- Interest-rate volatility.

Part 1)
Which of the following spreads are best used to value the asset-backed securities below?

	Credit-card ABS	Home-equity loan ABS
A)	Z-spread	OAS
B)	Z-spread	Z-spread
C)	OAS	Z-spread
D)	OAS	OAS

Your answer: A was incorrect. The correct answer was A)
Z-spread OAS

Credit-card loans do not have prepayment options, and as such can be valued using the zero-volatility spread, which does not take options into account. Bonds backed by home-equity loans do have prepayment risk, and as such require an option-adjusted spread.

Part 2)
Which of the following assumptions is **NOT** a limitation of the cash flow yield measure?

A) All cash flows will come in on schedule.
B) All interim cash flows are reinvested at the cash flow yield.
C) Mortgage-backed or asset-backed securities are held until the final payout.
D) Default risk associated with the underlying loans is constant over the life of the security.

Your answer: A was incorrect. The correct answer was D) Default risk associated with the underlying loans is constant over the life of the security.

The cash flow yield measure does not rely on any credit risk assumption. The other assumptions apply to the cash flow yield, and all represent a weakness of the metric, because they are not practical in a real-life context.

Part 3)
Which of the following is **NOT** a reason why effective duration estimates differ from vendor to vendor?

A) Prepayment assumptions.
B) Credit risk.
C) Option-adjusted spreads.
D) Interest-rate volatility.

Your answer: A was incorrect. The correct answer was B) Credit risk.

Credit risk is generally built into a bond's yield and price, and no estimates of it are needed to compute effective duration. The other assumptions can differ from vendor to vendor and result in different quote for effective duration.

Part 4)
Which of the following statements about the nominal spread is **TRUE** relative to mortgage-backed securities?

A) Nominal spreads can only be calculated using a Monte Carlo simulation.
B) The nominal spread and the Z-spread begin to converge when the yield curve steepens.
C) Nominal spreads work particularly well with PAC bonds.
D) A portion of the spread reflects prepayment risk.

Your answer: A was incorrect. The correct answer was D) A portion of the spread reflects prepayment risk.

The nominal spread includes some compensation for prepayment risk, but investors cannot tell how much of the spread reflects that risk. Because they do not accurately portray prepayment risk, nominal spreads will not be useful for valuing PAC bonds. Analysts can calculate nominal spreads without a Monte Carlo simulation. The difference between the nominal and zero-volatility spreads widens when the slope of the yield curve increases.

Part 5)
Which of the following is a reason why the lattice-based backward-induction method is ineffective for valuing mortgage-backed securities. The method cannot handle:

A) call options.
B) the path dependency of cash flows.
C) a lack of time-series price data, which can be difficult to obtain for MBS.
D) variable interest rates.

Your answer: A was incorrect. The correct answer was B) the path dependency of cash flows.

MBS prepayments depend on the level of the interest rate at a particular point in time and also on the path the interest rate has taken in order to get to a certain level. Backward induction can't easily capture path-dependent cash flows, and as such is not useful for predicting prepayments. Backward induction can account for call options and variable interest rates. The method does not require time-series price data.

Part 6)
Which of the following statements about Monte Carlo simulations is **FALSE**?

A) Effective models must include assumptions about interest-rate paths, rate volatility, benchmark interest rates, and prepayments.
B) The simulations determine value by adding the zero-volatility spread to every spot rate along every interest-rate path.
C) They calculate the value of a mortgage-backed security as the average present value of cash flows along each potential interest-rate path.
D) The simulations can compensate for prepayment burnout.

Your answer: A was incorrect. The correct answer was B) The simulations determine value by adding the zero-volatility spread to every spot rate along every interest-rate path.

Monte Carlo simulations add the option-adjusted spread to every spot rate. The other statements are true.

Question 4 - #9433

Mark Houston, a Level I CFA candidate, has just been hired as a junior analyst in the mortgage-management department of Fixed Income Strategies. Houston is asked to perform some analysis on the mortgage pool shown in Table 1. All mortgages are conforming 30-year fixed-rate loans. Table 2 includes the corresponding single month mortality rates (SMM) for each loan.

Table 1
Overview of Mortgage Pools

Pool	*Outstanding Mortgage*	*Weight in Pool*	*Mortgage Rate*	*Months Remaining*	*Service Fee (bp)*	*Net Interest*	*Monthly Payment*	*Conditional Prepayment Rate*
1	$100,000	19.61%	8.25%	234	50	7.75%	$860.71	6.00%
2	$150,000	29.41%	7.70%	344	55	7.15%	$1,082.40	3.20%
3	$175,000	34.31%	6.90%	344	45	6.45%	$1,168.88	3.20%
4	$85,000	16.67%	9.20%	345	55	8.65%	$702.02	3.00%

Before tackling the job, Houston does some research on mortgage loans. First, he assembles some facts about the difference between fixed-rate mortgage loans and traditional fixed-income corporate bonds:

- Mortgage loan payments consist of both principal and interest.
- The final payment on a mortgage does not include the par amount of the loan.
- Servicing fees on mortgage pools decline as the loan matures.

- Straight corporate bonds do not include call options.

Houston observes that each pool has a different conditional prepayment rate. He is unsure how this rate relates to extension and contraction risk for a mortgage-backed security, and plans to do some research to find out.

Marvin Blanda, CFA, CEO of Fixed Income Strategies, tells Houston to calculate the expected prepayments for the first 12 months for all of the loans in the portfolio. He warns Houston not to forget the relationship between conditional prepayment rates (CPR) and single monthly mortality (SMM) rates.

Part 1)
Regarding conditional prepayment rates (CPR) and single monthly mortality (SMM) rates, which of the following is **TRUE**?

A) SMM is computed from the CPR to compute monthly prepayments.
B) CPR is computed from the SMM to compute monthly prepayments.
C) CPR is computed from the SMM to compute changes in loan maturity.
D) SMM is computed from the CPR to compute changes in loan maturity.

Your answer: A was incorrect. The correct answer was A) SMM is computed from the CPR to compute monthly prepayments.

CPRs are industry benchmarks. The single-monthly mortality rate (SMM) is computed as follows:
SMM = 1 - (1 - conditional prepayment rate)$^{1/12}$

Part 2)
Houston made a mistake in his research about the nature of mortgage loans. Which of the following is **NOT** a correct statement regarding mortgage loans as compared to straight corporate bonds?

A) Mortgage borrowers do not get call options.
B) Mortgage payments consist of both principal and interest.
C) The final mortgage payment does not include the par amount of the loan.
D) Servicing fees on mortgage pools decline as the loan matures.

Your answer: A was incorrect. The correct answer was A) Mortgage borrowers do not get call options.

A mortgage loan can be refinanced at any time. This is, in effect, a call option. The other three characteristics are consistent with mortgage loans and not traditional corporate bonds.

Part 3)
Blanda instructs Houston to calculate the weighted average coupon rate (WAC) for the mortgage pools in Table 1. Which of the following is *closest* to the WAC?

A) 7.78%.
B) 8.01%.
C) 8.29%.
D) 7.28%.

Your answer: A was incorrect. The correct answer was A) 7.78%.

This is just the weighted average of the mortgage rates. The contribution of each pool to the WAC is found by multiplying the weight of the pool by its respective coupon. The WAC is then found by adding all of the results together in the following manner: (0.1961 * 8.25%) + (0.2941 * 7.7%) + (0.3431 * 6.9%) + (0.1667 * 9.2%) = 7.78%.

Part 4)
Blanda tells Houston to recalculate the SMM for Pool 3 based on 200 PSA rather than the current 100 PSA. The revised SMM is *closest* to:

A) 0.36%.
B) 0.55%.

C) 0.97%.
D) 0.25%.

Your answer: A was incorrect. The correct answer was B) 0.55%.

SMM = 1 - (1 - conditional prepayment rate)$^{1/12}$
At 200 PSA, we must double the CPR. As such, the equation is:
SMM = 1 – (1 – [2 × 3.2%])$^{1/12}$
= .0055

Part 5)
Houston has come up with four potential relationships between conditional prepayment rates (CPRs) and extension and contraction risk for a mortgage-backed security. Which of the following statements is **TRUE**?

A) Extension risk is associated with the likelihood of actual prepayments being equal to the assumed CPR.
B) Contraction risk is associated with the likelihood of actual prepayments being less than the assumed CPR.
C) Contraction risk is associated with the likelihood of actual prepayments being equal to the assumed CPR.
D) Extension risk is associated with the likelihood of actual prepayments being less than the assumed CPR.

Your answer: A was incorrect. The correct answer was D) Extension risk is associated with the likelihood of actual prepayments being less than the assumed CPR.

When prepayments are slower than anticipated by the CPR, the mortgage-backed security will take longer to pay off its principal, resulting in an extension of its maturity.

Part 6)
Houston computes the estimated prepayment for the current month for Pool 2 at 100 PSA. Which of the following is *closest* to his estimated prepayment?

A) $405.73.
B) $705.45.
C) $248.46.
D) $609.77.

Your answer: A was incorrect. The correct answer was A) $405.73.

This value is computed as follows:

SMM = 1 - (1 - conditional prepayment rate)$^{1/12}$
SMM = 0.002707

Estimated prepayment = SMM x (beginning of month mortgage balance – scheduled principal repayment for the month) where SMM is a function of the conditional prepayment rate (CPR) for loan 2:

Scheduled repayment for the month = ($150,000 outstanding mortgage)(.077 rate/12 months)
= $962.50 interest due for the month.
$1,082.40 total payment - $962.50 interest = $119.90 paid on principal.

Using the previously calculated SMM:
Estimated prepayment = 0.002707 × ($150,000.00 - $119.90) = $405.73

Question 5 - #9327

Paul Wilken, CFA, works in the structured-product group of a large investment bank. One of his new tasks is to perform valuation analysis on mortgage-backed securities (MBS) and asset-backed securities (ABS). Wilken assigns some of his basic research to his assistant, Cheryl Pollock, who needs to familiarize herself with the many measures used to value these types of securities.

The first valuation metric that Pollock seeks to explore is the cash flow yield. Pollock would like to determine the strengths and weaknesses of the cash flow yield, so she writes down the following assumptions that represent limitations of the cash flow yield measure.

- The credit risk associated with the underlying loans is constant over the life of the security.
- The computation includes an assumption about the default rate of the underlying loans.
- All interim cash flows are reinvested at the cash flow yield.
- Mortgage-backed or asset-backed securities are held until maturity.

Pollock then considers the nominal spread. She finds this measure vastly superior to the cash flow yield, with far fewer limitations.

In the course of her research, Pollock learns that every dealer delivers different quotes for effective durations. She tries to determine why this is so, and concludes that the numbers are not equal because vendors use different estimates for:

- Prepayment models.
- Option-adjusted spreads.
- Convexity.
- Interest-rate volatility.

Wilken begins work on his valuations. He has some experience using interest rate lattice models to price interest rate derivatives. However, he has read that the lattice based backward induction method cannot be used to value mortgage-backed securities (MBS). Instead, he considers the merits of zero-volatility spreads and Monte Carlo simulations.

Part 1)
Which of Pollock's assumptions is **NOT** a limitation of the cash flow yield measure?

A) The computation includes an assumption about the default rate of the underlying loans.
B) The credit risk associated with the underlying loans is constant over the life of the security.
C) All interim cash flows are reinvested at the cash flow yield.
D) Mortgage-backed or asset-backed securities are held until maturity.

Your answer: A was incorrect. The correct answer was B) The credit risk associated with the underlying loans is constant over the life of the security.

The cash flow yield measure does not rely on any credit risk assumption. The remaining assumptions are in force, and represent limitations of the cash flow yield.

Part 2)
Pollock erred in her analysis of why dealers offer different quotes for effective duration. Which of the following is **NOT** a reason for variation in the effective duration measure? Estimates of:

A) prepayment models.
B) option-adjusted spreads.
C) convexity.
D) interest-rate volatility.

Your answer: A was incorrect. The correct answer was C) convexity.

The convexity metric is not needed to compute the effective duration. Differences in assumptions regarding prepayment, option-adjusted spreads, and changes in interest rates do affect duration calculations.

Part 3)
Which of the following is a reason why the lattice-based backward induction method **CANNOT** be used to value mortgage-backed securities?

A) Prepayments.
B) The path dependency of cash flows.
C) Default risk.

D) Variable interest rates.

Your answer: A was incorrect. The correct answer was B) The path dependency of cash flows.

Backward induction can't effectively capture path-dependent cash flows. Backward induction can account for many prepayments, default risk, and variable interest rates.

Part 4)
For what bonds will the Z-spread provide a useful valuation?

A) Bonds with call options, but not put options.
B) Convertible bonds.
C) Bonds with predictable prepayment patterns.
D) Noncallable zero-coupon bonds.

Your answer: A was incorrect. The correct answer was D) Noncallable zero-coupon bonds.

The zero-volatility spread does not take options of any kind into account, and it cannot handle bonds that allow prepayment. The spread can be calculated for any bond with no embedded options.

Part 5)
Which of the following statements about Monte Carlo simulations is **FALSE**?

A) Effective models must include assumptions about interest-rate paths, rate volatility, benchmark interest rates, and prepayments.
B) The simulations will add the zero-volatility spread to every spot rate along every interest-rate path.
C) They calculate the value of a mortgage-backed security as the average present value of cash flows along each potential interest-rate path.
D) The models can compensate for prepayment burnout.

Your answer: A was incorrect. The correct answer was B) The simulations will add the zero-volatility spread to every spot rate along every interest-rate path.

Monte Carlo simulations add the option-adjusted spread to every spot rate. The other statements are true.

Part 6)
Which of the following is a limitation of the nominal spread? It:

A) does not account for credit risk.
B) contains no adjustment for prepayment risk.
C) fails to compensate for liquidity risk.
D) can only be computed using Monte Carlo simulations.

Your answer: A was incorrect. The correct answer was B) contains no adjustment for prepayment risk.

The nominal spread does not properly capture the prepayment risk associated with MBS and ABS.

Question 6 - #9431

Scott Walters is an investment manager who considers an investment in an asset-backed security (ABS) that consists of the loans in Table 1. Table 2 includes the ABS tranches from which he can select.

Table 1
Characteristics of Loan Pool

Loan Group	*Amount*	*Weight in Pool*	*Gross Coupon*	*Maturity (Years)*	*Servicing Fee (bp)*	*Net Coupon*
1	$200,000,000	16.33%	8.25%	25	50	7.50%
2	$250,000,000	20.41%	7.70%	25		7.10%

3	$325,000,000	26.53%	6.90%	25		6.10%
4	$450,000,000	36.73%	9.20%	25		8.20%
Total	$1,225,000,000	100.00%				
Weighted Average			8.13%	25.00	50.00	7.30%

Table 2 *ABS Tranches of the Loan Pool*		
	Amount	*Percent of Total*
Senior Tranche	$700,000,000	58.33%
Subordinated Tranche 1	$300,000,000	25.00%
Subordinated Tranche 2	$100,000,000	8.33%
Subordinated Tranche 3	$100,000,000	8.33%
Total	$1,200,000,000	100.00%

Table 3 lists the prepayment percentages of the tranches in Table 2.

Table 3 *Prepayment Allocation*				
Years after Issuance	*Senior Tranche*	*Subordinated Tranche 1*	*Subordinated Tranche 2*	*Subordinated Tranche 3*
1-5	90.00%	5.00%	3.00%	2.00%
6-10	70.00%	15.00%	10.00%	5.00%
11-15	50.00%	25.00%	15.00%	10.00%
after year 15	30.00%	30.00%	25.00%	15.00%

Walters has long dealt with mortgage-backed securities (MBS) and is trying to understand the terminology in the asset-backed securities (ABS) market. In particular, he is interested in the relationship between an MBS passthrough and collateralized mortgage obligation (CMO) and an ABS paythrough structure.

Part 1)
Walters wonders why the prepayment percentages change over the life of the security. Which of the following *best* describes the rationale for this property? The prepayment allocations attempt to:

A) increase the maturity of junior subordinated tranches.
B) maintain the overcollateralization of the structure.
C) protect the structure in the event that credit losses reduce the subordinated tranches below their minimum value.
D) limit the extension risk of the senior tranche.

Your answer: A was incorrect. The correct answer was D) limit the extension risk of the senior tranche.

In order to maintain extension protection for the senior tranche at a desirable level, prepayments are allocated to the senior tranche at a relatively higher proportion in the early years.

Part 2)
Walters learns that the difference between the net coupons given and the stated 50 bp servicing fee is held as an excess servicing spread. Which of the following is **NOT** a purpose of the excess servicing spread in Table 1?

A) Establishing an account to pay for possible future losses.
B) Paying for administrative and managerial expenses.
C) Augmenting external credit enhancements.
D) Complementing the cash reserve fund of the structure.

Your answer: A was incorrect. The correct answer was B) Paying for administrative and managerial expenses.

The excess servicing spread is placed in a reserve account called the excess servicing spread account. It will gradually grow over the length of the loan, so that it provides increasing protection against possible future losses.

These funds complement the cash reserves and enhance any external arrangements.

Part 3)
Which of the following *best* describes the relationship between the MBS passthrough and CMO and an ABS paythrough? An ABS paythrough structure is:

A) created directly from the underlying loans unlike the way a CMO is created from an MBS passthrough.
B) similar to an MBS passthrough security except when using non-agency-based mortgages as collateral.
C) created from an ABS passthrough structure in the same way a CMO is created from an MBS passthrough.
D) created from an ABS passthrough structure unlike the way a CMO is created directly from the underlying mortgages.

Your answer: A was incorrect. The correct answer was A) created directly from the underlying loans unlike the way a CMO is created from an MBS passthrough.

A CMO is a paythrough structure. A pool of passthrough securities serves as collateral for CMO paythrough securities. In the ABS market, once the loans are pooled, either passthrough or paythrough securities may be issued – it is not necessary to first create passthroughs when creating a paythrough structure for an ABS.

Part 4)
An older investor with a short time horizon and a strong desire for extra income wishes to purchase a mortgage-backed or asset-backed security. Which of the following is the *best* choice?

A) Subordinated tranche 3 from the loan detailed above.
B) The senior tranche from the loan detailed above.
C) A collateralized mortgage obligation containing a series of mortgage pools like the one above.
D) Investment-grade bonds with short maturities, rather than asset- or mortgage-backed securities.

Your answer: A was incorrect. The correct answer was B) The senior tranche from the loan detailed above.

Investors with short time horizons and a need for income wish to avoid extension risk. The senior tranche from the above loan pool offers a chance to collect high prepayments during the first few years. The subordinated tranches protect against contraction risk, and do not meet the investor's needs. A CMO spreads the prepayment risk among many investors, again, not meeting this investor's needs. Short-maturity corporate bonds will return the principal quickly, but because of fixed coupon payments, will not provide extra income.

Part 5)
Suppose all of the securities in Table 1 were backed by auto loans. Which of the following statements *most accurately* describes the difference, if any, in prepayment characteristics of auto loans versus mortgages? Prepayments on auto loans:

A) rarely occur, since auto loans traditionally have short maturities and low interest rates.
B) occur frequently, but are rarely affected by refinancing.
C) are more sensitive to interest-rate changes than mortgage prepayments.
D) are affected by the same factors as mortgage prepayments.

Your answer: A was incorrect. The correct answer was B) occur frequently, but are rarely affected by refinancing.

Car loans tend to balances that are small enough so that the benefits from refinancing are small. Auto-loan prepayments occur whenever a car is sold, traded in, or wrecked—all of which are relatively frequent occurrences. Auto loans are less sensitive to interest rates than mortgage loans because of the relatively short maturities and smaller principal amounts. Consequently, they are not affected by all the same underlying factors as mortgage loans.

Part 6)
Based on the information in the tables above, which investment offers the most protection against default?

A) Loan group 3.

B) The senior tranche.
C) Subordinated tranche 3.
D) Loan group 4.

Your answer: A was incorrect. The correct answer was D) Loan group 4.

Loan group 4 has the highest excess servicing spread (9.20 – 8.20 – 0.50 = 0.50 or 50 bp excess servicing spread), which allows for the largest reserves against losses. The tranches offer protection against expansion or contraction risk, but probably have similar characteristics in terms of default risk.

Back to Test Review | Hide Questions | Print this Page