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Real Estate Capital Markets

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Problem Set 4: PACs, TACs, Floaters, and Inverse Floaters

Download the spreadsheet that accompanies this assignment and use the appropriate worksheet in the workbook to answer the following questions.

1. **Planned Amortization Class[1] (PAC)** (35 points). A PAC tranche[2] and a companion/support bond are created out of a mortgage pass-through (MPT) that has collateral of $600 million with a coupon rate of 5.375%, a WAC of 6%, and a WAM of 357 months. Of the $600 million in collateral, the PAC has a par value of $240 million and the par value of the support class is $360 million. The coupon rate on the PAC and Support bonds is 5% and 5.5% respectively. The PAC bands used for the PAC sinking fund schedule of principal are 100% PSA and 250% PSA. The PAC has a two year lockout (there is no principal payments to the PAC bond class in the first year). If the actual prepayment speed is 188% PSA,

   a. What are the monthly cash flows to the PAC and support bond? (Hint: You should make copies of your MPT spreadsheet to make it easier on yourself with respect to calculating the payments associated with the upper and lower PAC bands. To make a copy of your spreadsheet, position the cursor over a worksheet tab and right click on the mouse. Select **Move or Copy** …. then select the worksheet in the workbook that you wish to copy. In the lower left hand corner, click on the **Create a copy** box and then click the **OK** button.)

   b. What is the WAL for the PAC and for the support bond?

   c. What is the IRR for the PAC and the support bond if they are priced at $235M for the PAC and $345M for the support bond?

2. **Target Amortization Class (TAC)** (35 points). A TAC tranche and a companion/support bond are created out of a mortgage pass-through (MPT) that has collateral of $450 million with a coupon rate of 5.5%, a WAC of 5.92%, and a WAM of 351 months. Of the $450 million in collateral, the TAC has a par value of $393.75 million. The remaining $56.25 million of collateral is the par value of the support class. Both the TAC and Support bond have a coupon rate of 5.5%. The TAC band used for the TAC sinking fund schedule of principal is 175% PSA. If the actual prepayment speed is 188% PSA,

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[1] This problem was constructed to reflect conditions in the market at the time that this case was written. Information was obtained lexis-nexus, investext, and from the following websites http://www.commercebank.com/business/commercial/investments/commentary.asp , http://www.bondmarkets.com , http://www.bloomberg.com , and http://www.freddiemac.com/mbs/ among other sources of data.

[2] A planned amortization class (PAC) bond (tranche) was created to give some CMO tranches a structure similar to corporate bonds under certain conditions. PAC structures cause the principal component of the monthly payments to be "locked out" for a period of time, going instead to other tranches in the REMIC. The payment schedule and average life do not change as long as prepayments remain ***inside*** a specified band of prepayment rates. Speeds faster than the band could cause the PAC to shorten from its expected average life, while slower speeds could cause it to extend.

a. What are the monthly cash flows to the TAC and support bond?

b. What is the WAL for the TAC and for the support bond?

c. What is the IRR for the PAC and the support bond if they are priced at par for the TAC and at a 2% discount for the support bond?

3. **Floater and Inverse Floater** (30 points). A CMO consisting of an A Tranche and a B tranche are created out of a mortgage pass-through (MPT) that has $550 million collateral with a coupon rate of 5.5%, a WAC of 6%, and a WAM of 357 months. Of the $550 million in collateral, the Class A bond has a par value of $417.31 million and the par value of Tranche B is $132.69 million. Both bond classes have a coupon rate of 5.5%. A floater and inverse floater is created out of Tranche B such that:

- par value of the floater + par value of the inverse floater = par value of Tranche B,
- coupon leverage is 3.67
- the floor on the coupon rate associated with the inverse floater is set at 0% (this sets the maximum coupon rate for the floater)
- Coupon on the Floater = 3 month Treasury bill + 1.5%
- Coupon on the Inverse Floater = 20.167% – 3.67* 3 month Treasury bill

Assume that the path for mortgage rates, Treasury bill rates, and PSA are as follows:

Interest Rate Path

Year	Y1	Y2	Y3	Y4	Y5-Y7	Y8	Y9-Y14	Y15-End
MtgRates	0.050	0.0575	0.056	0.058	0.063	0.065	0.060	0.0575
Tbill	0.0175	0.009	0.0095	0.0096	0.0104	0.014	0.013	0.015
PSA	188	169	155	140	130	125	133	169

a. What are the monthly cash flows to Tranche A, the floater, and the inverse floater bond classes?

b. What are the IRRs for Tranche A, the floater, and the inverse floater bond classes assuming that each was purchased at par?

c. What are the WALs for Tranche A, the floater, and the inverse floater bond classes?