Depending on the level of geographic aggregation, this can result in substantial changes in historical values of the index and the implied changes in the LTVs of Enterprise mortgages.

*Question 29:* Should changes in WRS indexes resulting from revision volatility be reflected in indexes used in a stress test? If so, what should be the frequency of such revisions?

## F. Third Party Credit Issues

The Enterprises have credit exposure to institutions that provide mortgage credit enhancements or that serve as counterparties to derivative transactions. This exposure arises because the adverse economic environment of the ten-year stress period may cause some fraction of these institutions to fail and be unable to meet their financial obligations to the Enterprises.

# Credit Enhancements

The Enterprises reduce their exposure to mortgage credit losses through a variety of credit enhancements that transfer some or all of the risk to other parties. These credit enhancements include lender recourse, mortgage insurance, and pool insurance.

The use of mortgage insurance illustrates how credit enhancements work to mitigate credit losses and highlights some of the issues OFHEO must address. Generally, the Enterprises may not purchase a conventional mortgage whose LTV ratio exceeds 80 percent unless the seller retains a participation interest or enters into a repurchase agreement, or unless the mortgage is insured by a qualified insurer.<sup>31</sup> If insured mortgages experience actual losses, the insurance fully or partially compensates the Enterprises for those losses.

Applying an approach used by credit rating agencies for private mortgage insurers, some insurers may be assumed to go out of business during the stress period.<sup>32</sup> To reflect this possibility, OFHEO's stress test might assume the failure of some fraction of the private mortgage insurers who would then be unable to entirely fulfill their contractual obligations to the Enterprises.

*Question 30:* How should OFHEO calculate loss mitigation due to credit enhancements?

*Question 31:* What should OFHEO assume about the scope of coverage provided by credit enhancements?

*Question 32:* What assumptions should OFHEO make regarding the failure of credit enhancements over the stress period?

#### Derivatives Counterparties

The Enterprises use non-mortgage derivatives—interest rate and foreign exchange rate contracts—to hedge interest rate and foreign exchange rate risk. Should a counterparty default on its obligation under a derivative contract, an Enterprise may have to pay a new counterparty to take on the remaining obligation.

Derivatives counterparties present some of the same issues as credit enhancements. Generally, during an economic downturn, as one counterparty's credit deteriorates, the other party to the transaction may increase collateral requirements until eventually the value of pledged collateral more than covers risk exposure. Therefore, with prudent counterparty risk management, losses are most likely to occur due to unexpected counterparty bankruptcies. Such losses may be more directly related to potential financial market disturbances than to general economic conditions.

*Question 33:* How, if at all, should OFHEO incorporate the effect of counterparty defaults in the risk-based capital test?

### G. Non-Mortgage Investments

The Enterprises maintain nonmortgage investment portfolios that include Treasury securities, federal funds, time deposits, obligations of states and municipalities, auction rate preferred stock, medium-term notes, asset-backed securities, repurchase agreements, and other instruments. At the end of the third quarter in 1994, these investments totaled \$11.5 billion at Freddie Mac and \$35.1 billion at Fannie Mae. On average in recent quarters, these investment portfolios have ranged from two to five percent of assets plus MBS.

Many of these investments or their issuers are rated by the credit rating agencies. Even though these are very short-term and liquid investments, some of the issuers or the investments may be assumed to default during the stress period. To reflect this possibility, OFHEO's stress test might assume the failure of some fraction of the investments or issuers, based on their credit rating.

*Question 34:* How should OFHEO simulate the default behavior of

investments or issuers of short-term, liquid investments?

*Question 35:* What assumptions should OFHEO make about the performance of rated investments or issuers over the stress period?

*Question 36:* What assumptions should OFHEO make about gains and losses on the sale of collateral for repurchase agreements?

## II. Interest Rate Risk

Interest rate risk, associated primarily with the maintenance of a retained portfolio, caused the most serious losses ever experienced by the Enterprises. For a time during the early 1980's, Fannie Mae, which was then almost exclusively a portfolio institution, was insolvent on a mark-to-market basis.<sup>33</sup> (Freddie Mac focused much more completely on mortgage pass-through securities during that time period.) As did much of the thrift industry at the time, Fannie Mae funded long-term, low-yield, fixed-rate, single family mortgages with short-term liabilities; rising interest rates drove up funding costs, causing Fannie Mae to incur significant losses.

Since then, Fannie Mae and Freddie Mac (the latter has built a substantial retained portfolio over the past decade) have developed funding strategies that reduce their exposure to interest rate risk. To protect against rising rates, liabilities have been lengthened to match more closely the maturity of mortgage assets. When falling interest rates result in accelerated mortgage prepayments, callable debt structures now allow the Enterprises to retire some debt early or issue new debt to maintain more closely their desired net interest margin. Adjusting hedging strategies for adjustable-rate mortgage investments presents a more difficult problem.

The Enterprises have recently been building mortgage derivative portfolios that have an interest rate risk profile more complex than those of whole mortgages.

Interest rate risk also affects income from the Enterprises' securitization businesses. Float income—the return on invested mortgage principal and interest payments prior to the corresponding payment to investors—varies with the level of interest rates at which the Enterprises reinvest such funds. Interest rates affect prepayment rates, and changing prepayments affect float income at each Enterprise.

A number of issues related to the interest rate risk of the Enterprises are discussed below.

<sup>&</sup>lt;sup>31</sup> Federal National Mortgage Association Charter Act, section 302(b)(2) and (5)(C) (12 U.S.C. 1717(b)(2) and (5)(C)), and Federal Home Loan Mortgage Corporation Act, section 305(a)(2) and (4)(C) (12 U.S.C. 1454(a)(2) and (4)(C)).

<sup>&</sup>lt;sup>32</sup> "S&P's Structured Finance Criteria," Standard & Poor's (1988).

<sup>&</sup>lt;sup>33</sup> The market value of Fannie Mae's liabilities (primarily market-rate, short-term securities) exceeded the market value of its assets (primarily below market-rate residential mortgages).