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Fannie Mae's Loss Risk Is Larger, Computer Models Show

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Fannie Mae, the giant mortgage finance company, faces much bigger losses from interest rate swings than it has publicly disclosed, according to computer models used by the company to estimate the value of its assets and debts.

At the end of last year, the models showed that Fannie Mae's portfolio would have lost $7.5 billion in value if interest rates rose immediately by 1.5 percentage points, internal company documents provided to The New York Times indicated. At that time, the market value of all the assets on Fannie Mae's books, minus all the company's debts, was about $15 billion. So it would have lost roughly half its market value from such a sharp increase in interest rates, according to the models.

With $923 billion in assets, Fannie Mae is the second-largest financial company in the United States, trailing only Citigroup. Fannie Mae, which is sponsored by the federal government, helps keep mortgage rates down by buying mortgages from banks and selling them or its own bonds to investors around the world. But some investors and outside experts say the company has become dangerously large and highly leveraged, with too much debt and not enough equity.

The models were provided to The Times by a former Fannie Mae employee, in return for assurance that he not be identified.

The company's chairman, Franklin D. Raines, responding to a question at a news conference last week, said Fannie Mae did not depend on the market value of its portfolio to judge the success of its business. Asked whether Fannie Mae constructed such estimates weekly, he did not reply.

In interviews yesterday, executives at Fannie Mae acknowledged that the company estimates the value of its portfolio weekly, though it discloses such information to investors only once a year. The models provided to The Times are several months old, the executives said, and present an incomplete and misleading view of Fannie Mae's finances. They added that Fannie Mae hedges its risks properly and discloses them fully to investors.

"There is no reason for anybody to be worried about the company," said Peter Niculescu, Fannie Mae's executive vice president for the mortgage portfolio. "We are very happy, comfortable, and proud of our performance this year in what has turned out to be a very volatile interest rate environment."

Mr. Niculescu declined to say whether Fannie Mae's portfolio had gained or lost value this year.

The former employee, who now works for a company that does not directly compete with Fannie Mae, said he had decided to publicize the documents because he was worried that Fannie Mae was becoming a risk to taxpayers and the financial system.

Because it is so large, and because many investors think that the federal government will repay its bonds if the company cannot, the government could become engaged in a very expensive bailout of Fannie Mae if it mismanaged its risk, the company's critics warn. And if investors balked at buying Fannie Mae's bonds because they were concerned about the company's financial strength, mortgage rates could rise rapidly.

For years, critics of Fannie Mae have warned that it does not give them enough information to judge its risks. "I have no clue" about the company's sensitivity to interest rate moves, said Stan Jonas, managing director at Fimat USA, a bond and derivatives broker. "But no one else does either."

Fannie Mae has never publicly disclosed how much money it could lose if interest rates rose 1.5 percentage points in a very short period of time. The company said in its most recent annual report that if rates rose 1 percent on Dec. 31, it would actually have made $600 million. But that figure included gains that were not directly related to the value of its mortgages. In fact, the model predicted that Fannie Mae's portfolio would have lost $2.6 billion if rates rose 1 percent. From June 13 through July 29, the yield on the 10-year Treasury note, the benchmark of long-term interest rates, rose 1.33 percentage points, from 3.11 percent to 4.44 percent. The yield has since fallen slightly but remains more than 1.2 percentage points above its June low.

Mr. Niculescu said Fannie Mae had moved in the last few months to protect itself more aggressively from interest rate changes. Compared with other financial institutions, he said, it is well hedged and has plenty of capital.

Fannie Mae has not disclosed how much the recent rise in rates affected the market value of its holdings, and analysts have wildly varying estimates. Kenneth Posner, a stock analyst at Morgan Stanley who is bullish on Fannie Mae, said it did not disclose enough information for outside analysts to determine monthly changes in the portfolio's value.

Fannie Mae is owned by shareholders but operates under a federal charter that exempts it from paying state or local taxes. As a result, many professional investors think the government would repay the debt that Fannie Mae had issued if the company could not, although Fannie Mae explicitly says that its bonds do not carry a federal guarantee.

This sense of an implied guarantee enables Fannie Mae to borrow money more cheaply than other financial institutions, and over the last decade it has taken advantage of its low borrowing costs to grow fivefold. But some investors and independent experts have questioned whether it is nonetheless too vulnerable to changes in rates.

Fannie Mae once mainly insured mortgages held by other financial institutions against default, a steady but unglamorous business. But in the last decade, it has steadily increased the quantity of mortgages it holds instead of selling to other investors.

To buy those mortgages, Fannie Mae raises money by selling bonds. It makes money on the spread between the interest it receives on the mortgages and the interest it must pay on its debt.

That business plan seems relatively safe, since people typically do not default on their mortgages. But it has a hidden risk. Because homeowners have the right to prepay mortgages if interest rates fall, mortgages rise in value more slowly than Treasury bonds when rates drop. But they lose value more quickly than bonds when rates rise.

So Fannie Mae can lose money on its portfolio whether rates rise or fall. If the change in interest rates is gradual, then Fannie Mae will lose less money from the change than it makes on the rate spread between mortgages and the debt it has issued. But if rates change quickly, Fannie Mae can lose billions of dollars almost overnight.

The models provided by the former employee offer a glimpse of the risk that Fannie Mae takes and the leverage it uses to increase its profit at times when interest rates are relatively stable. Fannie Mae has more than $50 in debt for each $1 in equity capital, according to its most recent annual report.

Equity is the cushion that protects financial institutions from unexpected changes in the value of their assets. The greater the leverage, the smaller the losses required to wipe out a company's equity, leaving it without enough money to repay the people who hold its debt. Because Fannie is so highly leveraged, its equity could be wiped out if its assets fell in value by less than 2 percent, although it would not necessarily be forced to liquidate.

But if rates are relatively stable, Fannie's high leverage allows it to be extremely profitable. Since 2000, the company says it has had almost $20 billion in "core business earnings," its preferred measure of profitability. By other measures, including return on equity and profit per employee, Fannie Mae is among the most profitable companies in the world.

Fannie Mae and other big holders of mortgages and mortgage-backed securities chronically underestimate the odds of a big move in interest rates that could devastate the value of their portfolios, said Nassim Nicholas Taleb, a hedge fund manager and the author of two books about risk and the financial markets. In general, he said, Fannie Mae and other companies rely too much on computer models that do not account for rare but devastating breaks in markets.

"The fact that they have not blown up in the past doesn't mean that they're not going to blow up in the future," said Mr. Taleb, who is also an adjunct professor of mathematics at the Courant Institute of New York University. "The math is bogus."

The model Fannie Mae uses each week to estimate the value of its portfolio and its vulnerability to interest rate swings is complex. It must estimate the value of all of the hundreds of thousands of mortgages and mortgage-backed securities by estimating how much cash they will produce over time.

So the company simulates hundreds of different changes in short- and long-term interest rates for 30 years, then estimates how quickly the mortgages it owns will be paid back under each simulation. Based on those estimates, the company can roughly value its portfolio and estimate how vulnerable it might be to changes in rates over time.

In addition, Fannie Mae will "shock" its portfolio, estimating its vulnerability to an immediate swing in rates. To do that, it immediately moves the entire yield curve of short- and long-term rates up or down by some arbitrary amount, like one percentage point, and then recalculates the value of all its mortgages.

Rate shocks are almost always negative for Fannie Mae, and they are often strongly negative, because the shortfall between the value of the mortgages it owns and the value of the debt it has issued tends to widen at an accelerating pace.

Still, the simulations are not exact, because Fannie Mae can never exactly estimate all the factors that will affect its portfolio, or exactly how rates may change as it and other companies try to protect themselves from future changes, Mr. Taleb said.

"All these models are pseudoscience to me," he said. "There is no science in it."

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