

# Why HARM the Subprime Borrower?

By Rajdeep Sengupta and Yu Man Tam

© ILLUSTRATION WORKS/CORBIS

The hybrid adjustable rate mortgage or hybrid ARM (prophetically, the acronym is HARM) was the most common subprime mortgage product. Hybrid-ARM products were specialized products that included an initial period over which the repayment schedule on the mortgage resembled that of a fixed rate mortgage (FRM) and a subsequent period over which the payment schedule resembled an ARM.<sup>1</sup> The temporary introductory teaser rate was kept lower, arguably, to make the product attractive to the subprime borrower. The date at which the payments reset into an indexed rate (for example, LIBOR plus 6 percent) was typically two or three years after the closing date on the mortgage.<sup>2</sup> What was the rationale behind such a unique design on subprime products? Did this unique design have a role to play in the subsequent collapse of this market?

## Why Hybrid ARM?

First, subprime borrowers were typically those who had impaired or incomplete credit histories. Because of their higher risk of default, subprime borrowers were charged higher interest rates than conventional or prime borrowers on all kinds of loans. For example, the interest rates on subprime auto loans were about 25-30 percent on average, studies have shown.<sup>3</sup> If the interest rate on subprime mortgages had been set to price the risk as was done on subprime auto loans, it was unlikely that the mortgages could have been afforded by subprime borrowers. This is because mortgage obligations are significantly higher than payments on other forms of consumer debt, including auto loans. The hybrid-ARM product was conceived to enable subprime borrowers to obtain mortgages at affordable rates.<sup>4</sup>

It was believed that this could be achieved through the appreciation in house prices. Economist Gary Gorton argued in a paper in 2008 that the mortgage design sought to benefit from house price appreciation over short horizons. All else equal, borrowers could build up equity in their homes in a period of rising house prices and, in the eyes of the lender, become less of a risk on subsequent mortgages. This allowed them to refinance at a lower rate (on the subsequent mortgage), which also reduced their likelihood of default. In essence, house price appreciation was critical to the viability of the hybrid-ARM design. Therefore, the hybrid ARM product allowed payments at the teaser rate essentially to help the borrower build up equity, but once the loan reset into the indexed rate, payment obligations increased. This was done to reduce the lenders' exposure to a high-risk borrower over a long horizon and essentially force a refinancing of the mortgage. The borrower was prevented from refinancing early by including a penalty for prepayment on the mortgage.

In a recent paper, economists Geetesh Bhardwaj and Rajdeep Sengupta point to some lesser known facts about subprime mortgages in general.<sup>5</sup> First, over 70 percent of subprime originations for each year (2000-2007) were originated as refinances. Second, a significant majority of these originations were hybrid-ARM products designed to reset into a fully indexed rate after two or three years. Significantly, this reset was designed to be a step *up* (but hardly ever a step *down*), so as to increase the payment burden and essentially force a refinancing of the loan. Third, contrary to conventional wisdom, teaser rates on hybrid ARMs were not low and not significantly different from those on closing rates on

subprime FRMs. Fourth, most subprime originations included prepayment penalties with the prepayment term expiring no sooner than the reset date on the ARM. This meant that for hybrid-ARM products, the contract ensured that the penalty would be in effect at least as long as the borrower was required to pay the teaser rate. In short, the mortgage was designed to ensure that subprime borrowers continued to make monthly payments at the closing rates before they could refinance into another mortgage.

## Repayment Behavior on Subprime Mortgages

In terms of actual repayment behavior, the most important aspect of subprime loan performance was the high rates of early prepayments on the loan. A loan is said to be prepaid when it is either refinanced into another mortgage or the property is sold off. This is hardly surprising because refinancing was an integral part of the mortgage design.

A noteworthy observation here is that low interest rates were not always the motivation behind prepayments (refinances) in the subprime market. The notable examples here were hybrid-ARM products originated in 2003, a year of historically low interest rates. Interestingly, in all the years these products were in existence, subprime originations from 2003 showed the lowest default rates. However, the principal reason for the remarkable performance of 2003 originations was high and early refinances.<sup>6</sup> Indeed, almost 83 percent of hybrid-ARM subprime products originated in 2003 were refinanced by the end of 2006. The corresponding percentage for FRMs was 63 percent. Significantly, the fact that mortgages originated


*continued on Page 22*

continued from Page 21

during the low-interest-rate environment around 2003-2004 and refinanced in a high-rate environment in subsequent years indicates that lower rates were hardly the motivation behind subprime refinances. While we don't know for sure what the motivation was, the most plausible explanation would be to extract home equity.

### Why Did the Subprime Market Collapse?

The important thing to remember is that a borrower on the brink of default has an exit option: prepay the mortgage either by refinancing or selling the property. Interestingly, Bhardwaj and Sengupta found that the total proportion of loans that either went into default or were prepaid remained unchanged across all vintages. More important, there was a significantly high incidence of early prepayments on subprime originations of earlier vintages. However, this was followed by a sharp drop in prepayment rates after 2006, suggesting that fewer borrowers could use the prepayment exit option.

Why did prepayments decline for originations of later vintages? Herein lay the importance of the subprime mortgage design. Prepayments (either in the form of refinances or an outright sale of the property) were critical to the sustainability of subprime mortgages. In a regime of rising house prices, borrowers could avoid default by prepaying their loans (either through a refinance or a property sale). Moreover, if the house price appreciation was sufficiently large, a borrower could recover the costs of refinancing and even choose to extract equity. However, this option was no longer available when prices did not appreciate. Consequently, borrower defaults began to increase sharply in 2006, when house prices ceased to appreciate. 

---

*Rajdeep Sengupta is an economist and Yu Man Tam is a senior research associate at the Federal Reserve Bank of St. Louis. See <http://research.stlouisfed.org/econ/sengupta/> for more on Sengupta's work.*

### ENDNOTES

- <sup>1</sup> During the fixed leg of the hybrid ARM, the mortgagee pays a lower introductory closing rate called the teaser rate. The teaser rate remains in effect until the reset date, after which the repayment schedule on the hybrid ARM resembles an ARM. The reset date, market index rate used and the margin are decided at the closing date.
- <sup>2</sup> These mortgages are also called the 2/28 (two-year teaser rate followed by a 28-year ARM) and a 3/27 (three-year teaser rate followed by a 27-year ARM) respectively.
- <sup>3</sup> See Adams, Einav and Levin.
- <sup>4</sup> See Gorton.
- <sup>5</sup> See Bhardwaj and Sengupta.
- <sup>6</sup> See Bhardwaj and Sengupta.

### REFERENCES

- Adams, William; Einav, Liran; and Levin, Jonathan. "Liquidity Constraints and Imperfect Information in Subprime Lending." *American Economic Review*, 2009, Vol. 99, No. 1, pp. 49-84.
- Bhardwaj, Geetesh; and Sengupta, Rajdeep. "Did Prepayments Sustain the Subprime Market?" Working Papers 2008-039, Federal Reserve Bank of St. Louis, 2008.
- Gorton, Gary. "The Panic of 2007." National Bureau of Economic Research Working Paper 14358, 2008.

## READER EXCHANGE

### LETTER TO THE EDITOR

This is in response to "Inflation May Be the Next Dragon To Slay," an article that appeared in the January 2010 issue of *The Regional Economist*. To read more letters, go to <http://stlouisfed.org/publications/re/letters/index.cfm>

Feb. 2, 2010

### Dear Editor:

I would like to thank the researcher for clearly explaining the predicament that those in charge of the Fed will likely be facing. There is so much currency in the system, and the Fed continues to debase the dollar by printing money by the trillion. Where will it end? Does the American public realize the government isn't a separate entity but an extension of themselves? YOU the Americans will have to pay all the trillions in debt that the government is taking on. And your standard of living, based on debt and spending, cannot go on forever. It appears as though the high-octane lifestyle is almost at an end. Unusually, I found this article through the St. Louis Fed Reserve web site, which is interesting in itself because usually those who let the cat out of the bag, as it were, are most likely to conceal it. On the same page, a poll is being carried out about inflation. Currently, 812 people have taken the poll and 61 percent believe that inflation is "dead in the water." The dangers of such massive injections into the currency supply are being aired with increased vigor by many except the popular press. Unfortunately, the masses will not read the said article or know how to insulate themselves from the pain associated with high levels of inflation. I hope the problems do not come to light, but I bought 7 kg of silver today because I am betting that they do. Does anyone have a time frame to said inflation? I am guessing 2-3 years, but would welcome comments. Search for Bob Chapman. He constantly talks about said problems.

**John Kitcher**, English teacher in elementary school in Seoul, South Korea

Go to <http://stlouisfed.org/ExternalCFForms/EditorLetterEnt.cfm> to submit a letter electronically. You may also submit a letter to the editor using the e-mail address or street address on Page 2.