# Golden West Financial BUY GDW - NYSE 

## Why We Are Not Worried About Credit Quality

Golden West Financial is a savings and loan holding company for World Savings Bank, Atlas Advisers (an investment adviser and manager), and Atlas Securities (a registered broker-dealer). Golden West, the second largest thrift institution in the nation, is a member of the $S \& P 500$, and has the highest credit rating among the thrifts.

INVESTMENT CONCLUSION: Since reaching its 52-week high of $\$ 68.92$ on July 19, 2005, GDW has declined about $10 \%$. We believe investors have concerns about credit quality, net interest margin compression, and ultimately EPS growth. We believe these concerns are overblown. We are not worried about credit quality, and in this note we outline why based on our worst case scenario analysis. As for as the NIM, we continue to expect expansion as the loan repricing lags cause yields to rise faster than funding costs. As for EPS growth, investors now seem to be focused on the lower level of originations and the impact on loan growth. We continue to expect originations and loan growth to slow with the flat yield curve, but we do not expect the loan portfolio to shrink, as the Option ARM still provides borrowers significant value due to the payment options, as we discuss in this note. Even if we are incorrect on origination volume, prepayment penalties will likely drive earnings growth if the portfolio shrinks. We reiterate our BUY rating.

VALUATION SUMMARY: GDW trades at 12.9 x our 2005E EPS and 10.9x our 2006E EPS. We expect continued P/E multiple expansion, as Golden West continues to deliver positive earnings surprises and solid financial performance. GDW has an unmatchable earnings track record relative to other banks and thrifts and its fellow members of the S\&P 500. In our opinion, Golden West has the same or better outlook than stocks that trade at premium multiples with lower earnings growth prospects. We believe the current risk/reward ratio is very attractive as GDW trades at the low end of our \$61-\$95 (10.6-16.5x 2006E EPS) expected trading range. We reiterate our BUY rating. Our estimated twelve-month fair value estimate is $\$ 86$ (15.0x 2006E EPS).

| Recent 52-Week Range |  | Dividend | Yield | Valuation |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Price High | Low |  |  | 2005E P/E | 12.9x | Price/Book | 2.4 x |
| \$62.62 \$69.49 | \$53.20 | \$0.24 | 0.4\% | 2006E P/E | 10.9x | Price/Tang. Book | $2.4 x$ |
|  |  |  |  | Deposit Premium | 19.1\% | Core Deposit Premium | 44.6\% |
|  | EPS |  |  | Fundamentals |  |  |  |
|  | 2004A | 2005E | 2006E | Total Assets (billio | ) (\$) |  | 117.5 |
| Q1-March | \$0.97 | \$1.12A | \$1.37 | Tangible Equity/As | ts (\%) |  | 6.76 |
| Q2 - June | \$1.02 | \$1.16A | \$1.43 | 2006E Operating R | A (\%) |  | 1.27 |
| Q3 - September | \$1.05 | \$1.25E | \$1.47 | 2006E Operating R | E (\%) |  | 18.59 |
| Q4 - December | \$1.09 | \$1.32E | \$1.48 | Book Value Per Sh | re (\$) |  | 25.79 |
| Annual Operating | \$4.13 | \$4.85E | \$5.75 | Tangible Book Valu | Per Sha | (\$) | 25.79 |
| Annual Reported | \$4.13 | \$4.85E | \$5.75 | Shares Outstandin | (millions) |  | 307.8 |
| Average Daily Volu |  |  | 269,618 | Market Capitalizati | (billions) |  | \$19.3 |
| Average Daily Dolla | Volume ( | Millions) | \$16.9 | Three Year Proj. | S Growth | Rate | 17\% |

## KEY POINTS

- The Option ARM Can Have Negative Amortization, But Golden West Controls The Risks. Golden West has offered the Option ARM product for over 20 years and has had opportunities to see how the product acts in various interest rate and economic cycles. We view deferred interest as a more cost effective home equity line of credit and GDW controls the risk through conservative underwriting.
- Our Worst Case Scenario Analysis Indicates Minimal Losses. We compare the Option ARM to fixed rate and interest-only mortgages with rising rates and declining housing values. Our worse case scenario analysis indicates minimal losses for the Option ARM product due to conservative underwriting and active servicing.
- The Option ARM Is Still A Valuable Product With A Flat-To-Slightly Inverted Mortgage Curve. The Option ARM provides borrowers with trade-offs: payment options with low minimum requirements and little payment shock for the possibility of negative amortization. The minimum payment requirement makes the loan attractive to borrowers, even with ARM rates higher than fixed rate mortgages, as long as the benefit of the minimum payment does not outweigh the reduction of equity.

One-Year Stock Price Performance


Source: StockVal.

## NEGATIVE AMORTIZATION - BACKGROUND INFORMATION AND SIZE

What Is Negative Amortization? Golden West's primary mortgage product, the Option ARM, provides the borrower with payment flexibility. The payment options include anything over the minimum payment (usually a fully amortizing mortgage at $1.95 \%$ for 30 years). In some cases, the minimum payment does not cover the accrued interest, which creates negative amortization (also referred to as deferred interest). Negative amortization is the shortfall of the payment versus accrued interest that is added back to principal. With all of the media attention and uncertainty regarding this product, we will try to separate fact from fiction and ease investors' fears regarding the Option ARM at Golden West.

Characteristics Of The Option ARM. Every month, the borrower receives a statement indicating four payment options. These payment options include a fully amortizing payment, an interest-only payment, a minimum payment, and a payment that enables the loan to pay off 15 years from origination. We focus on the minimum payment as this is what the media and investors consider the most risky. If a borrower continues to make just the minimum payment, deferred interest will build. Every year the minimum payment amount can increase by a maximum of $7.5 \%$. The lesser increase of the fully amortized payment or a $7.5 \%$ increase is used. For example, using a $\$ 350,000$ mortgage at $5.50 \%$ the minimum payment would be $\$ 1,293$ per month in the first year. The payment in the second year would be the lesser increase of $7.5 \%$ ( $\$ 1,390$ monthly payment) or the fully amortized rate ( $\$ 2,036$ monthly payment). For most loans, the $7.5 \%$ annual increase does not apply in the tenth annual payment change and every fifth payment change thereafter. Deferred interest may occur as long as the loan balance remains below either $125 \%$ or $110 \%$ of the original mortgage amount. The $125 \%$ cap applies to loans with an original LTV at or below $85 \%$, while the $110 \%$ cap applies to loans with original LTVs over $85 \%$. If the loan reaches the cap limit, Golden West may require the loan to become fully amortizing over the remaining life.

OTS Has Addressed Negative Amortization By Providing Frameworks For Exams. In June 2005, the OTS (Golden West's primary regulator) updated its Examination Handbook to address the more "exotic" mortgage products. One of the revised sections included loans that have negative amortization features. According to the OTS, "Loan performance data has shown that prudent underwritten ARM mortgages with a negative amortization feature in the contract generally perform as well as fixed-rate mortgages. In fact, during a period when such loans would negatively amortize, many borrowers typically pay additional principal to minimize loss of equity...Focus your attention on loans where borrowers are only making the minimum required payments. Such borrowers may be at risk should the rate increase or they experience financial difficulties...Also determine the amount of mortgages in the portfolio that are actually negatively amortizing as opposed to those where the loan contract merely allows it." ${ }^{1}$ Golden West has been originating the Option ARM since the early ' 80 s and the regulators had ample opportunity to scrutinize and review the product across many economic and interest rate cycles. While it is possible that all of the risks were not uncovered, we believe it is likely the major risks have been identified and addressed.

Deferred Interest Was A Small Portion Of The Portfolio. Deferred interest was $\$ 160.2$ million in 2Q05 (14 bps of total loans and MBS) compared to $\$ 90.2$ million in 1Q05 ( 8 bps ), and $\$ 27.0$ million in $2 \mathrm{Q} 04(3 \mathrm{bps})$. We note as a percentage of loans and MBS, deferred interest reached a high of 38 bps in 2001. Deferred interest as a percentage of total revenue is estimated at $8.4 \%$ in 2 Q 05 and $4.5 \%$ in 1 Q 05 . Deferred interest as a percentage of loans and MBS is expected to increase as short-term rates rise and then decline as rates stabilize or fall.

Historically A Large Percentage Of Borrowers Chose The Lower Monthly Payment. We examined quarterly monthly payments from 1Q93-1Q05 when the company separated payoffs from monthly repayments (We note the company did not disclose this information in 2Q05). Over this time period, the average monthly payment speed averaged $1.8 \%$. We conclude from this that borrowers take full advantage of the minimal monthly payments to provide cash flow flexibility. As expected, as interest rates increased (we used 3-month LIBOR) the payment speed declined and as interest rates decreased, the payment speed rose. See Exhibit 1 below for further details.

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## Exhibit 1: Three Month LIBOR Versus Monthly Payment Rate - An Inverse Relationship



Source: JMS and company data.

## SCENARIO ANALYSIS:

## Comparison Of Option Arms, Interest Only, And Fixed Rate Mortgages With Stable Housing Values

The Assumptions For Our Analysis: Focus On California. We focus our analysis on the average loan in California, which comprises about two-thirds of Golden West's loan portfolio. California had rapid price appreciation over the past several years and according to media reports, is one of the prime markets that have a high percentage of Option ARM or similar products to total originations. The average loan size in California for Golden West was about $\$ 333,000$ in $2 \mathrm{Q} 05, \$ 315,000$ in 1 Q 05 and $\$ 325,000$ in 1 H 05 . Loan-to-value (LTV) ratios were below $70 \%$ on average. For simplicity we assume that current mortgage rates on the Option ARM and fixed rate mortgages are $5.50 \%$, the average loan size is $\$ 350,000$, and LTV ratio is $70 \%$. We compare the 30 -year fixed rate mortgage to the Option ARM and to a five-year interest only loan (and then fully amortizing). (According to National Mortgage News, interest-only loans accounted for $26 \%$ of all mortgages funded in $2 \mathrm{Q} 05,21 \%$ in 1 Q 05 , and $15 \%$ in 4Q04.) We then look at different rate scenarios: flat and an immediate rise and fall of 200 bps . For the Option ARM, we assume the minimum payment is made to assess the worst case scenario. We initially assume no change in the value of the home, but then relax this assumption. See Exhibits $12-16$ for the amortization schedules for each loan type.

Year 1 Comparison: Little Change In Outstanding Principal And LTV. With a flat or slightly inverted mortgage yield curve, the Option ARM product is still attractive to borrowers due to the payment options. In all rate scenarios (flat, up 200 bps , down 200 bps ), the Option ARM minimum monthly payment is $\$ 1,293$ or $\$ 714$ below the $\$ 2,007$ monthly payment for 30 -year fixed rate mortgage and $\$ 311$ below the interest-only mortgage. We note the Option ARM borrower can always make the fully amortized payment (or more than the minimum payment), but the minimum payment provides more flexibility. The payment option impacts the annual principal reduction. For the

30-year fixed rate mortgage, the annual percentage reduction of principal was $1.4 \%$, compared to additions of principal of $1.1 \%$ for the minimum payment for the Option ARM in a flat rate environment, $2.1 \%$ for the minimum payment with a rise of $200 \mathrm{bps}, 0.1 \%$ for the minimum payment for rates down 200 bps , and no change for the interest-only mortgage. This impacted the initial $70.0 \%$ LTV ratios minimally: $69.0 \%$ for the 30 -year fixed rate mortgage, $70.7 \%$ for the minimum payment with flat rates, $71.4 \%$ for the minimum payment with a 200 bps increase in rates, and $70 \%$ each for the minimum payment with a 200 bps decline in interest rates and the interest-only mortgage. Overall, in the first year of the mortgage, the payment options clearly provide a benefit to the borrower (lower monthly payments) while having little impact on the LTV ratio. We view the additional deferred interest similar to a home equity line of credit, as the borrower has the flexibility to draw down or repay the line depending on cash flow needs. See Exhibit 2 for the summary comparison table.

## Exhibit 2: Summary Statistics Per Loan Type For Year 1

|  | Annual Payment | Monthly Payment | Annual Principal Reduction Percentage | Cumulative Principal Reduction Percentage | LTV |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 30-Year Fixed Rate Mortgage | \$24,082 | \$2,007 | 1.4\% | 1.4\% | 69.0\% |
| Min Payment - Flat Rates | 15,520 | 1,293 | -1.1\% | -1.1\% | 70.7\% |
| Min Payment - Up 200 bps | 15,520 | 1,293 | -2.1\% | -2.1\% | 71.4\% |
| Min Payment - Down 200 bps | 15,520 | 1,293 | -0.1\% | -0.1\% | 70.0\% |
| Interest Only Mortgage | 19,250 | 1,604 | 0.0\% | 0.0\% | 70.0\% |

Source: JMS

Year 2 Comparison: A Rise In Monthly Payments And An Increase LTV Ratio. In the second year of these mortgages, a slight shift begins to occur. The Option ARM product had an increase in the minimum payment by $7.5 \%$ for all rate scenarios (flat, up 200 bps , and down 200 bps ) to $\$ 1,390$, which is $\$ 617$ lower than the monthly payment for the 30 -year fixed rate mortgage and $\$ 214$ lower than the interest-only mortgage. As expect, deferred interest increased for the Option ARM product assuming flat and up 200 bps rate scenarios, by $0.8 \%$ and $2.8 \%$ of the beginning of the year principal balance, respectively, while the declining rate environment had principal reduction of $1.3 \%$. The deferred interest continued to impact the LTV ratios: $68.0 \%$ for the 30 -year fixed rate mortgage, $71.3 \%$ for the minimum payment with flat rates, $73.5 \%$ for minimum payment with rates up $200 \mathrm{bps}, 69.2 \%$ for the minimum payment with rates down 200 bps , and $70.0 \%$ for the interest-only mortgage. The spread between the LTVs for 30 -year fixed rate mortgages and minimum payment with an increase of 200 bps of rates was $5.5 \%$. This information is summarized in Exhibit 3. We note that even with the increase in deferred interest, the LTV ratios are still conservative.

## Exhibit 3: Summary Statistics Per Loan Type For Year 2

|  | Annual Payment | Monthly Payment | Annual Principal Reduction Percentage | Cumulative Principal Reduction Percentage | LTV |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 30-Year Fixed Rate Mortgage | \$24,082 | \$2,007 | 1.5\% | 2.8\% | 68.0\% |
| Min Payment - Flat Rates | 16,684 | 1,390 | -0.8\% | -1.9\% | 71.3\% |
| Min Payment - Up 200 bps | 16,684 | 1,390 | -2.8\% | -5.0\% | 73.5\% |
| Min Payment - Down 200 bps | 16,684 | 1,390 | 1.3\% | 1.2\% | 69.2\% |
| Interest Only Mortgage | 19,250 | 1,604 | 0.0\% | 0.0\% | 70.0\% |

Source: JMS

Year 3 Comparison: A Further Separation In The LTV Ratios. We would characterize the differences in the third year as a widening of the spread in the LTV ratios for the 30 -year fixed rate mortgages and the minimum payment with a rise in rates of 200 bps . The LTV is $66.9 \%$ for the 30 -year fixed rate mortgage and $75.4 \%$ for the minimum payment - up 200 bps in rates, for a spread of $8.5 \%$. For minimum payment with flat rates, the LTV was
$71.6 \%$ ( $4.7 \%$ spread), while the minimum payment with interest rates down 200 bps was $68.0 \%$ ( $1.1 \%$ spread) and the interest-only mortgage was $70.0 \%$ ( $3.1 \%$ spread). Again, we view the spreads similar to a home equity line of credit with the added benefit of a lower first mortgage payment. The difference in the monthly payments remained steep with a $\$ 512$ lower payment for the Option ARM (all rate scenarios) versus the 30 -year fixed rate mortgages and a $\$ 109$ lower payment for all Option ARMs versus the interest-only loans. See Exhibit 4 for details.

## Exhibit 4: Summary Statistics Per Loan Type For Year 3

|  | Annual Payment | Monthly Payment | Annual Principal Reduction Percentage | Cumulative Principal Reduction Percentage | LTV |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 30-Year Fixed Rate Mortgage | \$24,082 | \$2,007 | 1.6\% | 4.4\% | 66.9\% |
| Min Payment - Flat Rates | 17,936 | 1,495 | -0.5\% | -2.3\% | 71.6\% |
| Min Payment - Up 200 bps | 17,936 | 1,495 | -2.6\% | -7.7\% | 75.4\% |
| Min Payment - Down 200 bps | 17,936 | 1,495 | 1.7\% | 2.9\% | 68.0\% |
| Interest Only Mortgage | 19,250 | 1,604 | 0.0\% | 0.0\% | 70.0\% |

Source: JMS

Year 4 Comparison: The Minimum Payment For The Option ARM Barely Exceeds The Interest-Only Mortgage And Is Still Way Below The Fixed Rate Loan. The changes in interest rates worked its way through the Option ARM in year 3 and will be stable until the loan matures. The monthly payment on the Option ARM (all scenarios) increased another $7.5 \%$ in year 4 to $\$ 1,607$, but was still $\$ 400$ less than the 30 -year fixed rate mortgage and only $\$ 3$ more than the interest only loan. The pace of growth in the deferred interest is starting to slow as well. The annual principal reduction was $1.7 \%$ for the 30 -year fixed rate mortgage, compared to increase of $0.1 \%$ for the minimum payment with flat rates, $2.4 \%$ increase for the minimum payment with rates up 200 bps , a decrease of $2.2 \%$ for the minimum payment with rates down $200 \mathrm{bps}(0.5 \%$ greater than the fixed rate mortgage), and no change for the interest-only loan. The LTVs for these products were: $65.8 \%$ for the fixed rate mortgage, $71.7 \%$ for the minimum payment with flat rates ( $5.9 \%$ spread), $77.2 \%$ for the minimum payment with rates up $200 \mathrm{bps}(11.4 \%$ spread), $66.5 \%$ for the minimum payment with rates down $200 \mathrm{bps}(0.7 \%$ spread), and $70.0 \%$ for the interest only mortgage ( $4.2 \%$ spread). See Exhibit 5 for further details. We note that all of these LTV ratios are still under $80 \%$ and would generally be considered conservative.

## Exhibit 5: Summary Statistics Per Loan Type For Year 4

|  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: |
|  | Annual <br> Payment | Monthly <br> Payment | Annual <br> Principal <br> Reduction <br> Percentage | Cumulative <br> Principal <br> Reduction <br> Percentage | LTV |
| 30-Year Fixed Rate Mortgage | $\$ 24,082$ | $\$ 2,007$ | $1.7 \%$ | $6.0 \%$ | $65.8 \%$ |
| Min Payment - Flat Rates | 19,281 | 1,607 | $-0.1 \%$ | $-2.5 \%$ | $71.7 \%$ |
| Min Payment - Up 200 bps | 19,281 | 1,607 | $-2.4 \%$ | $-10.3 \%$ | $77.2 \%$ |
| Min Payment - Down 200 bps | 19,281 | 1,607 | $2.2 \%$ | $5.0 \%$ | $66.5 \%$ |
| Interest Only Mortgage | 19,250 | 1,604 | $0.0 \%$ | $0.0 \%$ | $70.0 \%$ |

Source: JMS

Year 5 Comparison: Divergence In Option ARM Payments But LTVs Still Below 80\%... In year 5, the Option ARM had a $7.5 \%$ payment increase for the flat and up 200 bps rate scenarios. In the down 200 bps scenario, the payment only increased $2.1 \%$. Even with increase for the Option ARM, the monthly payment is still $\$ 280$ less than the fixed rate mortgage. The cumulative difference in payment between the Option ARM (flat or up 200 bps ) and the 30 -year fixed rate mortgage was $\$ 30,261$ or lower than $\$ 504$ per month on average. The trade off is a higher loan balance. The LTV of the 30 -year fixed rate mortgage was $64.6 \%$, compared to $71.5 \%$ for the minimum payment with flat rates ( $6.9 \%$ higher), $78.8 \%$ for the minimum payment with rates up 200 bps ( $14.2 \%$ higher), $64.9 \%$ for the minimum payment with rates down 200 bps ( $0.3 \%$ higher), and $70.0 \%$ for the interest-only mortgage ( $5.4 \%$ higher).

See Exhibit 6 for further details. Over five years, deferred interest was less than $10 \%$ of the value of the house (or less than $\$ 50,000$ ). We view the increase in the LTV ratio similar to a home equity line of credit or second mortgage and all the LTVs were below $80 \%$.
...And Last Year Of Low Payments For The Interest Only Loan. We note that year five is the last year of low payments for the interest-only loan and the borrower is going to have payment shock in year 6 , as the monthly payment increase $35.5 \%$ to $\$ 2,174$ from $\$ 1,604$ (assuming stable rates). The monthly payment would increase to $\$ 2,586$ (up $61.2 \%$ ) if we assume rate increased 200 bps over the past five years. We believe this could be troubling for some borrowers. If we assume the rising interest rate scenario, the borrower would have a monthly payment of $\$ 2,447$ ( $52.6 \%$ higher than year 5) if the loan was refinanced into a 30 -year fixed rate mortgage at $7.50 \%$. If the borrower were to refinance into another interest only mortgage at $7.50 \%$ ( 200 bps higher than the original loan), the monthly payment would be $\$ 2,188$ or $36.4 \%$ higher. If the borrower could not afford this increase, we believe the home would be sold so the borrower could retain his/her $30 \%$ equity. We assume that the interest-only borrower does not plan on remaining in the house for the full five years. We have more concerns that payment shocks would cause credit quality issues than a modest decline in housing values.

## Exhibit 6: Summary Statistics Per Loan Type For Year 5

|  | Annual Payment | Monthly <br> Payment | Annual Principal Reduction Percentage | Cumulative Principal Reduction Percentage | LTV |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 30-Year Fixed Rate Mortgage | \$24,082 | \$2,007 | 1.8\% | 7.7\% | 64.6\% |
| Min Payment - Flat Rates | 20,727 | 1,727 | 0.3\% | -2.2\% | 71.5\% |
| Min Payment - Up 200 bps | 20,727 | 1,727 | -2.1\% | -12.6\% | 78.8\% |
| Min Payment - Down 200 bps | 19,691 | 1,641 | 2.4\% | 7.3\% | 64.9\% |
| Interest Only Mortgage | 19,250 | 1,604 | 0.0\% | 0.0\% | 70.0\% |

Source: JMS

Year 7 Comparison: Option ARM Monthly Payments Are About Equal To The Fixed Rate Mortgage And The LTV Creeps Above $\mathbf{8 0 \%}$. It took seven years for the monthly minimum payment of the Option ARM (with a 200 bps increase in rates) to reach the fixed rate mortgage ( $\$ 1,996$ compared to $\$ 2,007$, a difference of $\$ 11$ ). Over this time, the borrower had $\$ 32,192$ in lower payments or an average savings of $\$ 383$ per month. Deferred interest on this loan increased to $16.5 \%$ of the original mortgage $(\$ 57,750)$ but still had a LTV of $81.5 \%$. We also note that the Option ARM with a decline in rates of 200 bps has a LTV of $61.5 \%$ or $0.5 \%$ lower than the fixed rate mortgage. We believe the benefit of the Option ARM (payment flexibility and low monthly minimum payments) clearly outweighs the risk (an increasing LTV ratio) as long as the borrower has enough equity in the property. We also note the average life of mortgages has fallen from 7-8 years about 5-10 years ago to about 3-4 years today (July prepayment speeds at Golden West indicate an average life of 3.2 years). As a result, the increase in the LTV ratio is not likely to have a major impact on credit quality (assuming the average life of mortgages stays low). See Exhibit 7 for summary statistics per loan type.

## Exhibit 7: Summary Statistics Per Loan Type For Year 7

|  | Annual Payment | Monthly <br> Payment | Annual Principal Reduction Percentage | Cumulative Principal Reduction Percentage | LTV |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 30-Year Fixed Rate Mortgage | \$24,082 | \$2,007 | 2.1\% | 11.4\% | 62.0\% |
| Min Payment - Flat Rates | 23,952 | 1,996 | 1.2\% | -0.2\% | 70.1\% |
| Min Payment - Up 200 bps | 23,952 | 1,996 | -1.5\% | -16.5\% | 81.5\% |
| Min Payment - Down 200 bps | 19,691 | 1,641 | 2.7\% | 12.1\% | 61.5\% |
| Interest Only Mortgage | 26,092 | 2,174 | 0.0\% | 2.1\% | 67.2\% |

[^1]Year 10 Comparison: The Last Year Of Deferred Interest. By the tenth year of just making the minimum payment with an increase of 200 bps in rates, the borrower just about covers the accrued interest. Negative amortizations added in year ten was only $0.3 \%$ or $\$ 1,419$. The LTV ratio peaked at $83.4 \%$ in year 10 compared to $57.6 \%$ for the 30 -year fixed rate mortgage ( $25.8 \%$ spread). The monthly payment for the Option ARM with a rise of 200 bps in rates was $\$ 2,27913.6 \%$ higher than the fixed rate mortgage, but over the past 10 years payments have averaged $\$ 177$ lower than the fixed rate mortgage. In a declining 200 bps rate environment, the Option ARM payment remained $18.2 \%$ lower than the fixed rate mortgage and repaid principal at faster pace (the Option ARM has a LTV ratio of $56.0 \%$ compared to $57.6 \%$ for the fixed rate mortgage). See Exhibit 8 for further details.

## Exhibit 8: Summary Statistics Per Loan Type For Year 10

|  | Annual Payment | Monthly Payment | Annual Principal Reduction Percentage | Cumulative Principal Reduction Percentage | LTV |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 30-Year Fixed Rate Mortgage | \$24,082 | \$2,007 | 2.6\% | 17.8\% | 57.6\% |
| Min Payment - Flat Rates | 27,344 | 2,279 | 2.6\% | 6.6\% | 65.4\% |
| Min Payment - Up 200 bps | 29,756 | 2,480 | -0.3\% | -19.2\% | 83.4\% |
| Min Payment - Down 200 bps | 19,691 | 1,641 | 3.3\% | 20.0\% | 56.0\% |
| Interest Only Mortgage | 26,092 | 2,174 | 0.0\% | 2.6\% | 62.4\% |

Source: JMS

## Key Conclusions:

- The Option ARM Provides The Borrower Payment Flexibility And Allows Participation In Changing Rate Environments. In a rising rate environment, the Option ARM borrower was able to trade off a lower monthly payment for an increasing loan balance. Said differently, the borrower was able to take a home equity line of credit out at the first mortgage rates, which is generally lower. With manageable payment increases each year ( $7.5 \%$ maximum), the borrower is not subject to payment shock (as in the case of the interest only loan). In a falling rate environment, the borrower repays principal at a faster rate than fixed rate borrowers by only making the minimum payment. We believe these features are what attracts borrowers to this product and why we do not believe a significant reduction in Option ARM originations would occur with a flat-to-slightly inverted mortgage curve (ARMs higher than fixed rate mortgages). If the mortgage curve were to invert (adjustable rates higher than fixed rates) significantly to where the trade off between the payment options and having equity in the home were no longer favorable, we believe this would cause a sharp drop in Option ARM originations. We would be concerned that Option ARM origination volumes would slow significantly if the spread inverted to $50-75 \mathrm{bps}$.
- Underwriting Standards Are Important. Our analysis demonstrated the importance of equity in the home for the Option ARM product with a rise in interest rates. This analysis would be drastically different if the initial LTV ratio was above $80 \%$ or if the house lost value to the point where the borrower has little or no equity. We would have major credit quality concerns for Golden West if the LTV ratios were over $80 \%$, but we are not worried since the average LTV is under $70 \%$ and the company has insurance for the small amount of the portfolio with an LTV over $80 \%$. Additionally, we would have concerns if borrowers were qualified at the minimum payment rate. While the increase in the minimum payment is a modest $7.5 \%$ per year, the difference in the minimum monthly payment between year 1 and year 3 was $15.6 \%$ or $\$ 202$ in the plus 200 bps rate scenario. This increase could cause modest payment shock if qualified at the lower rate (and would be even more troublesome combined with a high LTV). Golden West qualifies borrowers at the fully indexed amortizing rate, which provides some comfort that the borrower can afford to make monthly payments at higher rates.


## Comparison Of Option Arms, Interest-Only, And Fixed Rates With Declining Housing Values

Equity Is An Important Factor For Underwriting. For the second scenario, we examine the impact of declining housing values on the same loan products. We used a total of three cases: stable housing values, a $5 \%$ annual decline for five years (and then stable), and a $20 \%$ initial decline and then stable. The goal is to determine how these products differ under adverse conditions. We already showed that deferred interest increases as rates rise and that equity is important to minimize losses. Declining housing values and an increase in deferred interest is likely to eat up some/most of the borrowers' equity and could cause credit quality issues. Below we examine the LTV ratios for each of the products in each of the cases.

LTVs For Stable Housing Prices: Still Plenty Of Equity Across The Board. The stable housing prices are similar to the previous analysis. The 30-year fixed rate mortgage had an initial LTV of $70.0 \%$ that declined every year thereafter due to the principal repayments. The Option ARM (assuming flat rates and only the minimum payment) had a peak LTV of $71.7 \%$ in year 4 and decline every year thereafter. In an up 200 bps rate environment and only making the minimum payment, the Option ARM reached a peak LTV of $83.4 \%$ in year 10 and then declined. In a down 200 bps rate environment, the Option ARM never increased above $70.0 \%$ by just making the minimum payment. The interest-only loan never had a LTV above the initial $70.0 \%$ as well. See Exhibit 9 below for further details.

## Exhibit 9: LTV Ratios With Stable Housing Values

| (\%) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Year | 30-Year <br> Fixed Rate | Min. Payment Flat Rates | Min. <br> Payment Up 200 Bps | Min. Payment Down 200 Bps | Interest Only |
| 0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| 1 | 69.0 | 70.7 | 71.4 | 70.0 | 70.0 |
| 2 | 68.0 | 71.3 | 73.5 | 69.2 | 70.0 |
| 3 | 66.9 | 71.6 | 75.4 | 68.0 | 70.0 |
| 4 | 65.8 | 71.7 | 77.2 | 66.5 | 70.0 |
| 5 | 64.6 | 71.5 | 78.8 | 64.9 | 70.0 |
| 6 | 63.3 | 71.0 | 80.3 | 63.2 | 68.6 |
| 7 | 62.0 | 70.1 | 81.5 | 61.5 | 67.2 |
| 8 | 60.6 | 68.8 | 82.5 | 59.7 | 65.7 |
| 9 | 59.1 | 67.1 | 83.1 | 57.9 | 64.1 |
| 10 | 57.6 | 65.4 | 83.4 | 56.0 | 62.4 |
| 11 | 55.9 | 63.5 | 83.3 | 54.0 | 60.6 |
| 12 | 54.2 | 61.5 | 82.6 | 51.9 | 58.7 |
| 13 | 52.3 | 59.4 | 81.5 | 49.8 | 56.7 |
| 14 | 50.4 | 57.2 | 79.6 | 47.6 | 54.6 |
| 15 | 48.3 | 54.9 | 77.0 | 45.4 | 52.4 |
| 16 | 46.2 | 52.4 | 74.1 | 43.0 | 50.0 |
| 17 | 43.9 | 49.9 | 70.9 | 40.6 | 47.6 |
| 18 | 41.5 | 47.1 | 67.5 | 38.1 | 45.0 |
| 19 | 39.0 | 44.3 | 63.8 | 35.5 | 42.2 |
| 20 | 36.3 | 41.2 | 59.9 | 32.8 | 39.3 |
| 21 | 33.5 | 38.0 | 55.7 | 30.0 | 36.3 |
| 22 | 30.5 | 34.6 | 51.1 | 27.1 | 33.1 |
| 23 | 27.4 | 31.1 | 46.2 | 24.1 | 29.7 |
| 24 | 24.1 | 27.3 | 41.0 | 21.0 | 26.1 |
| 25 | 20.6 | 23.4 | 35.3 | 17.8 | 22.3 |
| 26 | 16.9 | 19.2 | 29.2 | 14.5 | 18.3 |
| 27 | 13.0 | 14.8 | 22.7 | 11.0 | 14.1 |
| 28 | 8.9 | 10.1 | 15.7 | 7.5 | 9.6 |
| 29 | 4.6 | 5.2 | 8.1 | 3.8 | 4.9 |
| 30 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

LTVs For A 5\% Decline For Five Years: LTVs Do Not Exceed 108\%. The loan with the most risk with a 5\% decline in housing values for five years is the Option ARM with a 200 bps increase in rates that makes only the minimum payment. The LTV breaks $100 \%$ in year five, peaks at $107.8 \%$ in year 10 , and has a total of ten years with an LTV over $100 \%$ (years 5-14). If the borrower has payment issues during this time period, losses would be likely, but would be less than $10 \%$. We believe the ability to pay rather than the value is the primary reason for default. We do not expect that many ARMs have a 10-year life, as borrowers are likely to refinance and/or move. Even if the average ARM life extends, we do not expect the entire portfolio of borrowers to have payment issues and default. The other loan types have the following peak LTVs: 30-year fixed rate mortgage was $83.5 \%$ in year 5, Option ARM with flat rates was $92.4 \%$ in year 5, Option ARM with rates down 200 bps was $83.9 \%$ in year 5, and interest-only loans was $90.5 \%$ in year 5 (See Exhibit 10 below). A period of continuing declining housing values would reduce borrower's equity, but based on these analysis losses would not be overwhelming.

Exhibit 10: LTV Ratios With A 5\% Decline In Housing Values For 5 Years And Then Stable

| (\%) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Year | 30-Year <br> Fixed Rate | Min. Payment Flat Rates | Min. Payment Up 200 Bps | Min. Payment Down 200 Bps | Interest Only |
| 0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| 1 | 72.7 | 74.5 | 75.2 | 73.7 | 73.7 |
| 2 | 75.4 | 79.0 | 81.4 | 76.6 | 77.6 |
| 3 | 78.1 | 83.6 | 87.9 | 79.3 | 81.6 |
| 4 | 80.8 | 88.1 | 94.8 | 81.7 | 85.9 |
| 5 | 83.5 | 92.4 | 101.9 | 83.9 | 90.5 |
| 6 | 81.9 | 91.8 | 103.8 | 81.7 | 88.7 |
| 7 | 80.1 | 90.6 | 105.4 | 79.5 | 86.8 |
| 8 | 78.3 | 88.9 | 106.6 | 77.2 | 84.9 |
| 9 | 76.4 | 86.8 | 107.4 | 74.8 | 82.8 |
| 10 | 74.4 | 84.5 | 107.8 | 72.3 | 80.6 |
| 11 | 72.3 | 82.0 | 107.6 | 69.8 | 78.3 |
| 12 | 70.0 | 79.5 | 106.8 | 67.1 | 75.8 |
| 13 | 67.6 | 76.8 | 105.3 | 64.4 | 73.3 |
| 14 | 65.1 | 73.9 | 102.9 | 61.6 | 70.6 |
| 15 | 62.5 | 70.9 | 99.6 | 58.6 | 67.7 |
| 16 | 59.7 | 67.8 | 95.7 | 55.6 | 64.7 |
| 17 | 56.7 | 64.4 | 91.7 | 52.4 | 61.5 |
| 18 | 53.6 | 60.9 | 87.2 | 49.2 | 58.1 |
| 19 | 50.4 | 57.2 | 82.5 | 45.8 | 54.6 |
| 20 | 46.9 | 53.3 | 77.4 | 42.3 | 50.8 |
| 21 | 43.3 | 49.1 | 71.9 | 38.7 | 46.9 |
| 22 | 39.4 | 44.8 | 66.1 | 35.0 | 42.7 |
| 23 | 35.4 | 40.2 | 59.7 | 31.1 | 38.3 |
| 24 | 31.1 | 35.3 | 52.9 | 27.1 | 33.7 |
| 25 | 26.6 | 30.2 | 45.6 | 23.0 | 28.8 |
| 26 | 21.8 | 24.8 | 37.8 | 18.7 | 23.6 |
| 27 | 16.8 | 19.1 | 29.3 | 14.3 | 18.2 |
| 28 | 11.5 | 13.0 | 20.3 | 9.7 | 12.5 |
| 29 | 5.9 | 6.7 | 10.5 | 4.9 | 6.4 |
| 30 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Source: JMS
LTVs For A 20\% Initial Decline: Maximum Loss Should Be About 4\%. The initial 20\% decline in collateral value is a less severe loss scenario for these mortgage products. The product most exposed is the Option ARM with an increase of 200 bps in rates and borrowers just making the minimum payment. The LTV reached $100 \%$ in year 6 , peaked at $104.3 \%$ in year 10 , and has an LTV over $100 \%$ for 8 years (years $6-13$ ). This loss rate for the mortgager
would be about 4\% if the borrowers had payment issues and had to foreclose. This compared to a maximum LTV of $86.3 \%$ for the 30 -year fixed rate mortgage (in year 1), $89.6 \%$ for the Option ARM with flat rates (year 4), $87.6 \%$ for the Option ARM with 200 bps decline in rates (year 1), and $87.5 \%$ for the interest-only mortgage (years 1-5). See Exhibit 11 below for further details.

Exhibit 11: LTV Ratios With 20\% Initial Decline In Housing Values And Then Stable

| (\%) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Year | 30-Year <br> Fixed Rate | Min. Payment Flat Rates | Min. Payment Up 200 Bps | Min. Payment Down 200 Bps | Interest Only |
| 0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| 1 | 86.3 | 88.4 | 89.3 | 87.6 | 87.5 |
| 2 | 85.0 | 89.1 | 91.8 | 86.5 | 87.5 |
| 3 | 83.7 | 89.5 | 94.2 | 85.0 | 87.5 |
| 4 | 82.3 | 89.6 | 96.5 | 83.1 | 87.5 |
| 5 | 80.8 | 89.4 | 98.5 | 81.1 | 87.5 |
| 6 | 79.2 | 88.7 | 100.4 | 79.1 | 85.8 |
| 7 | 77.5 | 87.6 | 101.9 | 76.9 | 84.0 |
| 8 | 75.8 | 86.0 | 103.1 | 74.7 | 82.1 |
| 9 | 73.9 | 83.9 | 103.9 | 72.4 | 80.1 |
| 10 | 71.9 | 81.7 | 104.3 | 70.0 | 78.0 |
| 11 | 69.9 | 79.4 | 104.1 | 67.5 | 75.7 |
| 12 | 67.7 | 76.9 | 103.3 | 64.9 | 73.4 |
| 13 | 65.4 | 74.3 | 101.8 | 62.3 | 70.9 |
| 14 | 63.0 | 71.5 | 99.5 | 59.5 | 68.2 |
| 15 | 60.4 | 68.6 | 96.3 | 56.7 | 65.5 |
| 16 | 57.7 | 65.6 | 92.6 | 53.8 | 62.6 |
| 17 | 54.9 | 62.3 | 88.6 | 50.7 | 59.5 |
| 18 | 51.9 | 58.9 | 84.4 | 47.6 | 56.2 |
| 19 | 48.7 | 55.3 | 79.8 | 44.3 | 52.8 |
| 20 | 45.4 | 51.5 | 74.9 | 40.9 | 49.2 |
| 21 | 41.9 | 47.5 | 69.6 | 37.5 | 45.3 |
| 22 | 38.1 | 43.3 | 63.9 | 33.8 | 41.3 |
| 23 | 34.2 | 38.8 | 57.8 | 30.1 | 37.1 |
| 24 | 30.1 | 34.1 | 51.2 | 26.2 | 32.6 |
| 25 | 25.7 | 29.2 | 44.1 | 22.2 | 27.9 |
| 26 | 21.1 | 24.0 | 36.5 | 18.1 | 22.9 |
| 27 | 16.2 | 18.4 | 28.4 | 13.8 | 17.6 |
| 28 | 11.1 | 12.6 | 19.6 | 9.4 | 12.0 |
| 29 | 5.7 | 6.5 | 10.1 | 4.8 | 6.2 |
| 30 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Source: JMS

Key Conclusion: Equity Is Important If Housing Values Decline. We believe the above analysis demonstrates the importance of borrower's equity in the underwriting of Option ARMs. By historical standards, these declines in housing values were extreme (see our industry report titled "Housing Bubble? A Historical Look" Dated June 28, 2005). As long as interest rates rise at a gradual pace, we do not expect significant deterioration in housing values. Specifically for Golden West, we do not expect the loan portfolio to blow up because borrowers all of a sudden cannot make payments and the value of home declines significantly. As shown above, even an extreme decline in housing values would result in less than a $10 \%$ loss rate and that would occur over five years from now. Even under extreme duress, we do not expect the entire portfolio to have issues all at once, as not all loans are expected to reach years 6-13. However, we would expect the loss rate to increase at Golden West as net charges-offs were 1 bp or less since 1998.

Other Ways Golden West Mitigates Credit Risk. The above scenario analysis assumed what we would consider the worst case (i.e. interest rates rising another 200 bps and housing valuing declining $20 \%-25 \%$ ). We determined that underwriting is an important factor in limiting credit losses, specifically low loan to value ratios and qualifying borrowers at the fully indexed amortizing rate. There are other factors at Golden West to consider as well. First, the company has been originating and servicing this product for over 20 years. During this time, the product has been tested through many interest rate and economic cycles and management had an opportunity to make adjustments as necessary. We believe this is one of the reasons that net charge-offs have never been more than 18 bps of average loans in a period when the industry had loss rate near or above 100 bps . Another reason why net charge-offs have never been high is the company has an active servicing department that we believe tries to anticipate problems before they occur. The company has its own appraisal department to determine the value of the house. If it uses another appraiser, that appraiser must be trained by Golden West and the final appraisal is reviewed in-house. This helps the company to determine a true fair value, and we would not be surprised if Golden West uses more conservative values than others. Lastly, the company does not originate loans in the high end of the housing market, which typically have the largest swings in value. Golden West generally stays in the middle of the housing spectrum, which historically had low price decline in periods of stress. These factors, along with the scenario analysis reviewed above, provide us comfort that credit quality issues will not become significant.

Exhibit 12: Amortization Schedule For A 30-Year Fixed Rate Mortgage

| Assumptions: Purchase Price Loan Amount: Rate: <br> Years: |  | $\begin{array}{r} 500,000 \\ 350,000 \\ 5.50 \% \\ 30 \\ \hline \end{array}$ | Monthly Payment | Principal Reduction | Remaining Balance | $\begin{array}{r} \text { LTV } \\ (\%) \\ \hline \end{array}$ | Principal Reduction |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Accrued | Total |  |  |  |  |  |  |
| Year | Interest (\$) | Payment <br> (\$) |  |  |  |  | Per Year <br> (\%) | Cumulative <br> (\%) |
| 0 |  |  |  |  | 350,000 | 70.0 |  |  |
| 1 | 19,250 | 24,082 | 2,007 | 4,832 | 345,168 | 69.0 | 1.4 | 1.4 |
| 2 | 18,984 | 24,082 | 2,007 | 5,098 | 340,070 | 68.0 | 1.5 | 2.8 |
| 3 | 18,704 | 24,082 | 2,007 | 5,378 | 334,692 | 66.9 | 1.6 | 4.4 |
| 4 | 18,408 | 24,082 | 2,007 | 5,674 | 329,019 | 65.8 | 1.7 | 6.0 |
| 5 | 18,096 | 24,082 | 2,007 | 5,986 | 323,033 | 64.6 | 1.8 | 7.7 |
| 6 | 17,767 | 24,082 | 2,007 | 6,315 | 316,718 | 63.3 | 2.0 | 9.5 |
| 7 | 17,419 | 24,082 | 2,007 | 6,662 | 310,055 | 62.0 | 2.1 | 11.4 |
| 8 | 17,053 | 24,082 | 2,007 | 7,029 | 303,026 | 60.6 | 2.3 | 13.4 |
| 9 | 16,666 | 24,082 | 2,007 | 7,415 | 295,611 | 59.1 | 2.4 | 15.5 |
| 10 | 16,259 | 24,082 | 2,007 | 7,823 | 287,788 | 57.6 | 2.6 | 17.8 |
| 11 | 15,828 | 24,082 | 2,007 | 8,254 | 279,534 | 55.9 | 2.9 | 20.1 |
| 12 | 15,374 | 24,082 | 2,007 | 8,708 | 270,827 | 54.2 | 3.1 | 22.6 |
| 13 | 14,895 | 24,082 | 2,007 | 9,186 | 261,640 | 52.3 | 3.4 | 25.2 |
| 14 | 14,390 | 24,082 | 2,007 | 9,692 | 251,949 | 50.4 | 3.7 | 28.0 |
| 15 | 13,857 | 24,082 | 2,007 | 10,225 | 241,724 | 48.3 | 4.1 | 30.9 |
| 16 | 13,295 | 24,082 | 2,007 | 10,787 | 230,937 | 46.2 | 4.5 | 34.0 |
| 17 | 12,702 | 24,082 | 2,007 | 11,380 | 219,556 | 43.9 | 4.9 | 37.3 |
| 18 | 12,076 | 24,082 | 2,007 | 12,006 | 207,550 | 41.5 | 5.5 | 40.7 |
| 19 | 11,415 | 24,082 | 2,007 | 12,667 | 194,884 | 39.0 | 6.1 | 44.3 |
| 20 | 10,719 | 24,082 | 2,007 | 13,363 | 181,520 | 36.3 | 6.9 | 48.1 |
| 21 | 9,984 | 24,082 | 2,007 | 14,098 | 167,422 | 33.5 | 7.8 | 52.2 |
| 22 | 9,208 | 24,082 | 2,007 | 14,874 | 152,548 | 30.5 | 8.9 | 56.4 |
| 23 | 8,390 | 24,082 | 2,007 | 15,692 | 136,857 | 27.4 | 10.3 | 60.9 |
| 24 | 7,527 | 24,082 | 2,007 | 16,555 | 120,302 | 24.1 | 12.1 | 65.6 |
| 25 | 6,617 | 24,082 | 2,007 | 17,465 | 102,837 | 20.6 | 14.5 | 70.6 |
| 26 | 5,656 | 24,082 | 2,007 | 18,426 | 84,411 | 16.9 | 17.9 | 75.9 |
| 27 | 4,643 | 24,082 | 2,007 | 19,439 | 64,971 | 13.0 | 23.0 | 81.4 |
| 28 | 3,573 | 24,082 | 2,007 | 20,508 | 44,463 | 8.9 | 31.6 | 87.3 |
| 29 | 2,445 | 24,082 | 2,007 | 21,636 | 22,826 | 4.6 | 48.7 | 93.5 |
| 30 | 1,255 | 24,082 | 2,007 | 22,826 | - | - | 100.0 | 100.0 |

Exhibit 13: Amortization Schedule For An Option ARM With Flat Rates

| Assumptions: |  |
| :--- | ---: |
| Purchase Price | 500,000 |
| Loan Amount: | 350,000 |
| Rate: | $5.50 \%$ |
| Years: | 30 |


| Year | Accrued Interest$\qquad$ (\$) | Total Payment$\qquad$ | Average Monthly Payment$\qquad$ (\$) | Principal Reduction$\qquad$ (\$) | $\qquad$ | $\begin{array}{r} \text { LTV } \\ \text { (\%) } \\ \hline \end{array}$ | Principal Reduction |  | Payment Increase (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  | $\begin{array}{r} \hline \text { Per Year } \\ \text { (\%) } \\ \hline \end{array}$ | Cumulative (\%) |  |
| 0 |  |  |  |  | 350,000 | 70.0 |  |  |  |
| 1 | 19,250 | 15,520 | 1,293 | $(3,730)$ | 353,730 | 70.7 | (1.1) | (1.1) |  |
| 2 | 19,455 | 16,684 | 1,390 | $(2,771)$ | 356,501 | 71.3 | (0.8) | (1.9) | 7.5 |
| 3 | 19,608 | 17,936 | 1,495 | $(1,672)$ | 358,173 | 71.6 | (0.5) | (2.3) | 7.5 |
| 4 | 19,699 | 19,281 | 1,607 | (419) | 358,591 | 71.7 | (0.1) | (2.5) | 7.5 |
| 5 | 19,723 | 20,727 | 1,727 | 1,004 | 357,587 | 71.5 | 0.3 | (2.2) | 7.5 |
| 6 | 19,667 | 22,281 | 1,857 | 2,614 | 354,973 | 71.0 | 0.7 | (1.4) | 7.5 |
| 7 | 19,524 | 23,952 | 1,996 | 4,429 | 350,544 | 70.1 | 1.2 | (0.2) | 7.5 |
| 8 | 19,280 | 25,749 | 2,146 | 6,469 | 344,075 | 68.8 | 1.8 | 1.7 | 7.5 |
| 9 | 18,924 | 27,344 | 2,279 | 8,420 | 335,655 | 67.1 | 2.4 | 4.1 | 6.2 |
| 10 | 18,461 | 27,344 | 2,279 | 8,883 | 326,772 | 65.4 | 2.6 | 6.6 | - |
| 11 | 17,972 | 27,344 | 2,279 | 9,372 | 317,401 | 63.5 | 2.9 | 9.3 | - |
| 12 | 17,457 | 27,344 | 2,279 | 9,887 | 307,514 | 61.5 | 3.1 | 12.1 | - |
| 13 | 16,913 | 27,344 | 2,279 | 10,431 | 297,083 | 59.4 | 3.4 | 15.1 | - |
| 14 | 16,340 | 27,344 | 2,279 | 11,005 | 286,078 | 57.2 | 3.7 | 18.3 | - |
| 15 | 15,734 | 27,344 | 2,279 | 11,610 | 274,468 | 54.9 | 4.1 | 21.6 | - |
| 16 | 15,096 | 27,344 | 2,279 | 12,248 | 262,220 | 52.4 | 4.5 | 25.1 | - |
| 17 | 14,422 | 27,344 | 2,279 | 12,922 | 249,298 | 49.9 | 4.9 | 28.8 | - |
| 18 | 13,711 | 27,344 | 2,279 | 13,633 | 235,665 | 47.1 | 5.5 | 32.7 | - |
| 19 | 12,962 | 27,344 | 2,279 | 14,382 | 221,283 | 44.3 | 6.1 | 36.8 | - |
| 20 | 12,171 | 27,344 | 2,279 | 15,174 | 206,109 | 41.2 | 6.9 | 41.1 | - |
| 21 | 11,336 | 27,344 | 2,279 | 16,008 | 190,101 | 38.0 | 7.8 | 45.7 | - |
| 22 | 10,456 | 27,344 | 2,279 | 16,889 | 173,213 | 34.6 | 8.9 | 50.5 | - |
| 23 | 9,527 | 27,344 | 2,279 | 17,817 | 155,396 | 31.1 | 10.3 | 55.6 | - |
| 24 | 8,547 | 27,344 | 2,279 | 18,797 | 136,598 | 27.3 | 12.1 | 61.0 | - |
| 25 | 7,513 | 27,344 | 2,279 | 19,831 | 116,767 | 23.4 | 14.5 | 66.6 | - |
| 26 | 6,422 | 27,344 | 2,279 | 20,922 | 95,845 | 19.2 | 17.9 | 72.6 | - |
| 27 | 5,271 | 27,344 | 2,279 | 22,073 | 73,773 | 14.8 | 23.0 | 78.9 | - |
| 28 | 4,057 | 27,344 | 2,279 | 23,287 | 50,486 | 10.1 | 31.6 | 85.6 | - |
| 29 | 2,777 | 27,344 | 2,279 | 24,567 | 25,919 | 5.2 | 48.7 | 92.6 | - |
| 30 | 1,426 | 27,344 | 2,279 | 25,919 | - | - | 100.0 | 100.0 | - |

Source: JMS

Exhibit 14: Amortization Schedule For An Option ARM With 200 Bps Increase In Rates In One Year

| Assumptions: |  |
| :--- | ---: |
| Purchase Price | 500,000 |
| Loan Amount: | 350,000 |
| Rate: | $5.50 \%$ |
| Years: | 30 |


|  | Average Interest | Accrued | Total | Average Monthly | Principal | Remaining |  | Principal Reduction |  | Payment Increase (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Rate (\%) | Interest $\qquad$ | Payment | $\begin{array}{r} \text { Payment } \\ \text { (\$) } \\ \hline \end{array}$ | Reduction (\$) | Balance $(\$)$ | LTV <br> (\%) | Per Year (\%) | Cumulative (\%) |  |
| 0 | 5.50 |  |  |  |  | 350,000 | 70.0 |  |  |  |
| 1 | 6.50 | 22,750 | 15,520 | 1,293 | $(7,230)$ | 357,230 | 71.4 | (2.1) | (2.1) |  |
| 2 | 7.50 | 26,792 | 16,684 | 1,390 | $(10,108)$ | 367,338 | 73.5 | (2.8) | (5.0) | 7.5 |
| 3 | 7.50 | 27,550 | 17,936 | 1,495 | $(9,615)$ | 376,952 | 75.4 | (2.6) | (7.7) | 7.5 |
| 4 | 7.50 | 28,271 | 19,281 | 1,607 | $(8,991)$ | 385,943 | 77.2 | (2.4) | (10.3) | 7.5 |
| 5 | 7.50 | 28,946 | 20,727 | 1,727 | $(8,219)$ | 394,162 | 78.8 | (2.1) | (12.6) | 7.5 |
| 6 | 7.50 | 29,562 | 22,281 | 1,857 | $(7,281)$ | 401,443 | 80.3 | (1.8) | (14.7) | 7.5 |
| 7 | 7.50 | 30,108 | 23,952 | 1,996 | $(6,156)$ | 407,599 | 81.5 | (1.5) | (16.5) | 7.5 |
| 8 | 7.50 | 30,570 | 25,749 | 2,146 | $(4,821)$ | 412,420 | 82.5 | (1.2) | (17.8) | 7.5 |
| 9 | 7.50 | 30,931 | 27,680 | 2,307 | $(3,251)$ | 415,671 | 83.1 | (0.8) | (18.8) | 7.5 |
| 10 | 7.50 | 31,175 | 29,756 | 2,480 | $(1,419)$ | 417,091 | 83.4 | (0.3) | (19.2) | 7.5 |
| 11 | 7.50 | 31,282 | 31,988 | 2,666 | 706 | 416,385 | 83.3 | 0.2 | (19.0) | 7.5 |
| 12 | 7.50 | 31,229 | 34,387 | 2,866 | 3,158 | 413,227 | 82.6 | 0.8 | (18.1) | 7.5 |
| 13 | 7.50 | 30,992 | 36,966 | 3,080 | 5,974 | 407,253 | 81.5 | 1.4 | (16.4) | 7.5 |
| 14 | 7.50 | 30,544 | 39,738 | 3,312 | 9,194 | 398,059 | 79.6 | 2.3 | (13.7) | 7.5 |
| 15 | 7.50 | 29,854 | 42,719 | 3,560 | 12,864 | 385,195 | 77.0 | 3.2 | (10.1) | 7.5 |
| 16 | 7.50 | 28,890 | 43,638 | 3,636 | 14,748 | 370,447 | 74.1 | 3.8 | (5.8) | 2.2 |
| 17 | 7.50 | 27,784 | 43,638 | 3,636 | 15,854 | 354,593 | 70.9 | 4.3 | (1.3) | - |
| 18 | 7.50 | 26,594 | 43,638 | 3,636 | 17,043 | 337,549 | 67.5 | 4.8 | 3.6 | - |
| 19 | 7.50 | 25,316 | 43,638 | 3,636 | 18,321 | 319,228 | 63.8 | 5.4 | 8.8 | - |
| 20 | 7.50 | 23,942 | 43,638 | 3,636 | 19,696 | 299,532 | 59.9 | 6.2 | 14.4 | - |
| 21 | 7.50 | 22,465 | 43,638 | 3,636 | 21,173 | 278,360 | 55.7 | 7.1 | 20.5 | - |
| 22 | 7.50 | 20,877 | 43,638 | 3,636 | 22,761 | 255,599 | 51.1 | 8.2 | 27.0 | - |
| 23 | 7.50 | 19,170 | 43,638 | 3,636 | 24,468 | 231,131 | 46.2 | 9.6 | 34.0 | - |
| 24 | 7.50 | 17,335 | 43,638 | 3,636 | 26,303 | 204,828 | 41.0 | 11.4 | 41.5 | - |
| 25 | 7.50 | 15,362 | 43,638 | 3,636 | 28,276 | 176,553 | 35.3 | 13.8 | 49.6 | - |
| 26 | 7.50 | 13,241 | 43,638 | 3,636 | 30,396 | 146,157 | 29.2 | 17.2 | 58.2 | - |
| 27 | 7.50 | 10,962 | 43,638 | 3,636 | 32,676 | 113,481 | 22.7 | 22.4 | 67.6 | - |
| 28 | 7.50 | 8,511 | 43,638 | 3,636 | 35,127 | 78,354 | 15.7 | 31.0 | 77.6 | - |
| 29 | 7.50 | 5,877 | 43,638 | 3,636 | 37,761 | 40,593 | 8.1 | 48.2 | 88.4 | - |
| 30 | 7.50 | 3,044 | 43,638 | 3,636 | 40,593 | - | - | 100.0 | 100.0 | - |

Exhibit 15: Amortization Schedule For An Option ARM With 200 Bps Decrease In Rates In One Year

| Assumptions: |  |
| :--- | ---: |
| Purchase Price | 500,000 |
| Loan Amount: | 350,000 |
| Rate: | $5.50 \%$ |
| Years: | 30 |


| Year | Average <br> Interest <br> Rate $\qquad$ <br> (\%) | Accrued Interest (\$) | TotalPayment$(\$)$ | Average <br> Monthly <br> Payment $\qquad$ | Principal Reduction (\$) | $\begin{array}{r} \text { Remaining } \\ \text { Balance } \\ (\$) \\ \hline \end{array}$ | $\begin{array}{r} \text { LTV } \\ (\%) \\ \hline \end{array}$ | Principal Reduction |  | Payment Increase$\qquad$ (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  | Per Year <br> (\%) | Cumulative (\%) |  |
| 0 | 5.50 |  |  |  |  | 350,000 | 70.0 |  |  |  |
| 1 | 4.50 | 15,750 | 15,520 | 1,293 | (230) | 350,230 | 70.0 | (0.1) | (0.1) |  |
| 2 | 3.50 | 12,258 | 16,684 | 1,390 | 4,426 | 345,804 | 69.2 | 1.3 | 1.2 | 7.5 |
| 3 | 3.50 | 12,103 | 17,936 | 1,495 | 5,832 | 339,971 | 68.0 | 1.7 | 2.9 | 7.5 |
| 4 | 3.50 | 11,899 | 19,281 | 1,607 | 7,382 | 332,589 | 66.5 | 2.2 | 5.0 | 7.5 |
| 5 | 3.50 | 11,641 | 19,691 | 1,641 | 8,050 | 324,539 | 64.9 | 2.4 | 7.3 | 2.1 |
| 6 | 3.50 | 11,359 | 19,691 | 1,641 | 8,332 | 316,207 | 63.2 | 2.6 | 9.7 | - |
| 7 | 3.50 | 11,067 | 19,691 | 1,641 | 8,624 | 307,583 | 61.5 | 2.7 | 12.1 | - |
| 8 | 3.50 | 10,765 | 19,691 | 1,641 | 8,926 | 298,657 | 59.7 | 2.9 | 14.7 | - |
| 9 | 3.50 | 10,453 | 19,691 | 1,641 | 9,238 | 289,419 | 57.9 | 3.1 | 17.3 | - |
| 10 | 3.50 | 10,130 | 19,691 | 1,641 | 9,561 | 279,858 | 56.0 | 3.3 | 20.0 | - |
| 11 | 3.50 | 9,795 | 19,691 | 1,641 | 9,896 | 269,962 | 54.0 | 3.5 | 22.9 | - |
| 12 | 3.50 | 9,449 | 19,691 | 1,641 | 10,242 | 259,719 | 51.9 | 3.8 | 25.8 | - |
| 13 | 3.50 | 9,090 | 19,691 | 1,641 | 10,601 | 249,118 | 49.8 | 4.1 | 28.8 | - |
| 14 | 3.50 | 8,719 | 19,691 | 1,641 | 10,972 | 238,146 | 47.6 | 4.4 | 32.0 | - |
| 15 | 3.50 | 8,335 | 19,691 | 1,641 | 11,356 | 226,790 | 45.4 | 4.8 | 35.2 | - |
| 16 | 3.50 | 7,938 | 19,691 | 1,641 | 11,753 | 215,037 | 43.0 | 5.2 | 38.6 | - |
| 17 | 3.50 | 7,526 | 19,691 | 1,641 | 12,165 | 202,872 | 40.6 | 5.7 | 42.0 | - |
| 18 | 3.50 | 7,101 | 19,691 | 1,641 | 12,591 | 190,282 | 38.1 | 6.2 | 45.6 | - |
| 19 | 3.50 | 6,660 | 19,691 | 1,641 | 13,031 | 177,250 | 35.5 | 6.8 | 49.4 | - |
| 20 | 3.50 | 6,204 | 19,691 | 1,641 | 13,487 | 163,763 | 32.8 | 7.6 | 53.2 | - |
| 21 | 3.50 | 5,732 | 19,691 | 1,641 | 13,959 | 149,804 | 30.0 | 8.5 | 57.2 | - |
| 22 | 3.50 | 5,243 | 19,691 | 1,641 | 14,448 | 135,356 | 27.1 | 9.6 | 61.3 | - |
| 23 | 3.50 | 4,737 | 19,691 | 1,641 | 14,954 | 120,402 | 24.1 | 11.0 | 65.6 | - |
| 24 | 3.50 | 4,214 | 19,691 | 1,641 | 15,477 | 104,925 | 21.0 | 12.9 | 70.0 | - |
| 25 | 3.50 | 3,672 | 19,691 | 1,641 | 16,019 | 88,906 | 17.8 | 15.3 | 74.6 | - |
| 26 | 3.50 | 3,112 | 19,691 | 1,641 | 16,579 | 72,327 | 14.5 | 18.6 | 79.3 | - |
| 27 | 3.50 | 2,531 | 19,691 | 1,641 | 17,160 | 55,167 | 11.0 | 23.7 | 84.2 | - |
| 28 | 3.50 | 1,931 | 19,691 | 1,641 | 17,760 | 37,407 | 7.5 | 32.2 | 89.3 | - |
| 29 | 3.50 | 1,309 | 19,691 | 1,641 | 18,382 | 19,025 | 3.8 | 49.1 | 94.6 | - |
| 30 | 3.50 | 666 | 19,691 | 1,641 | 19,025 | - | - | 100.0 | 100.0 | - |

## Exhibit 16: Amortization Schedule For An Interest Only Mortgage

| Assumptions: |  |
| :--- | ---: |
| Purchase Price | 500,000 |
| Loan Amount: | 350,000 |
| Rate: | $5.50 \%$ |
| Years: | 30 |


|  | Accrued | tal | Average Monthly | Principal | Remaining |  | Principal | Reduction | Payment |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Interest $\qquad$ | Payment $\qquad$ | Payment (\$) | Reduction $\qquad$ | Balance (\$) | $\begin{array}{r} \text { LTV } \\ (\%) \\ \hline \end{array}$ | Per Year <br> (\%) | Cumulative (\%) | Increase (\%) |


| 0 |  |  |  |  | 350,000 | 70.0 |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 19,250 | 19,250 | 1,604 | - | 350,000 | 70.0 | - | - |  |
| 2 | 19,250 | 19,250 | 1,604 | - | 350,000 | 70.0 | - | - | - |
| 3 | 19,250 | 19,250 | 1,604 | - | 350,000 | 70.0 | - | - | - |
| 4 | 19,250 | 19,250 | 1,604 | - | 350,000 | 70.0 | - | - | - |
| 5 | 19,250 | 19,250 | 1,604 | - | 350,000 | 70.0 | - | - | - |
| 6 | 19,250 | 26,092 | 2,174 | 6,842 | 343,158 | 68.6 | 2.0 | 2.0 | 35.5 |
| 7 | 18,874 | 26,092 | 2,174 | 7,219 | 335,939 | 67.2 | 2.1 | 4.0 | - |
| 8 | 18,477 | 26,092 | 2,174 | 7,616 | 328,324 | 65.7 | 2.3 | 6.2 | - |
| 9 | 18,058 | 26,092 | 2,174 | 8,034 | 320,289 | 64.1 | 2.4 | 8.5 | - |
| 10 | 17,616 | 26,092 | 2,174 | 8,476 | 311,813 | 62.4 | 2.6 | 10.9 | - |
| 11 | 17,150 | 26,092 | 2,174 | 8,943 | 302,870 | 60.6 | 2.9 | 13.5 | - |
| 12 | 16,658 | 26,092 | 2,174 | 9,434 | 293,436 | 58.7 | 3.1 | 16.2 | - |
| 13 | 16,139 | 26,092 | 2,174 | 9,953 | 283,482 | 56.7 | 3.4 | 19.0 | - |
| 14 | 15,592 | 26,092 | 2,174 | 10,501 | 272,982 | 54.6 | 3.7 | 22.0 | - |
| 15 | 15,014 | 26,092 | 2,174 | 11,078 | 261,903 | 52.4 | 4.1 | 25.2 | - |
| 16 | 14,405 | 26,092 | 2,174 | 11,688 | 250,216 | 50.0 | 4.5 | 28.5 | - |
| 17 | 13,762 | 26,092 | 2,174 | 12,330 | 237,885 | 47.6 | 4.9 | 32.0 | - |
| 18 | 13,084 | 26,092 | 2,174 | 13,009 | 224,877 | 45.0 | 5.5 | 35.7 | - |
| 19 | 12,368 | 26,092 | 2,174 | 13,724 | 211,153 | 42.2 | 6.1 | 39.7 | - |
| 20 | 11,613 | 26,092 | 2,174 | 14,479 | 196,674 | 39.3 | 6.9 | 43.8 | - |
| 21 | 10,817 | 26,092 | 2,174 | 15,275 | 181,399 | 36.3 | 7.8 | 48.2 | - |
| 22 | 9,977 | 26,092 | 2,174 | 16,115 | 165,283 | 33.1 | 8.9 | 52.8 | - |
| 23 | 9,091 | 26,092 | 2,174 | 17,002 | 148,282 | 29.7 | 10.3 | 57.6 | - |
| 24 | 8,155 | 26,092 | 2,174 | 17,937 | 130,345 | 26.1 | 12.1 | 62.8 | - |
| 25 | 7,169 | 26,092 | 2,174 | 18,923 | 111,421 | 22.3 | 14.5 | 68.2 | - |
| 26 | 6,128 | 26,092 | 2,174 | 19,964 | 91,457 | 18.3 | 17.9 | 73.9 | - |
| 27 | 5,030 | 26,092 | 2,174 | 21,062 | 70,395 | 14.1 | 23.0 | 79.9 | - |
| 28 | 3,872 | 26,092 | 2,174 | 22,221 | 48,175 | 9.6 | 31.6 | 86.2 | - |
| 29 | 2,650 | 26,092 | 2,174 | 23,443 | 24,732 | 4.9 | 48.7 | 92.9 | - |
| 30 | 1,360 | 26,092 | 2,174 | 24,732 | - | - | 100.0 | 100.0 | - |

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[^2]
[^0]:    ${ }^{1}$ Source: Office of Thrift Supervision Examination Handbook, Section 212, page 18, June 2005.

[^1]:    Source: JMS

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