In the third scenario, the Wongs' payments would more than double at the start of the sixth year, and remain above what they can reasonably afford for 13 more years. Even if the Fed rate were to remain at the low rate of 4%, the monthly payments would still jump to above what the Wongs can afford at the start of the sixth year.

Interest-Only Loan: Here, the only change in the worksheet constructed previously is the computation of the payments for the first 5 years; because the loan is interest-only during this period, the monthly payment is computed as simple interest at 4.2% on the \$380,000 loan for a 30-year period:

$$INT = PVr = 380{,}000 \times .042/12 = \$1{,}330.00$$

The formula you could use in the spreadsheet in cell F3 is `=C3/1200*I$3`, and then copy this across and down the entire block of payments for the first 5 years. The rest of the spreadsheet (including the balance on principal) will adjust itself accordingly with the formulas you had for the hybrid loan. Below is a portion of the result, with a lot more red than in the hybrid loan case!

	A	B	C	D	E	F	G	H	I	J	K
1	Year	28% of Monthly Income	Interest Rate			Monthly Payment			Balance on Principal		
2			Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
3	1	\$1,866.67	4.2	4.2	4.2	\$1,330.00	\$1,330.00	\$1,330.00	\$380,000.00	\$380,000.00	\$380,000.00
4	2	\$1,941.33	4.2	4.2	4.2	\$1,330.00	\$1,330.00	\$1,330.00	\$380,000.00	\$380,000.00	\$380,000.00
5	3	\$2,018.99	4.2	4.2	4.2	\$1,330.00	\$1,330.00	\$1,330.00	\$380,000.00	\$380,000.00	\$380,000.00
6	4	\$2,099.75	4.2	4.2	4.2	\$1,330.00	\$1,330.00	\$1,330.00	\$380,000.00	\$380,000.00	\$380,000.00
7	5	\$2,183.74	4.2	4.2	4.2	\$1,330.00	\$1,330.00	\$1,330.00	\$380,000.00	\$380,000.00	\$380,000.00
8	6	\$2,271.09	9.25	9	15	\$3,254.25	\$3,188.95	\$4,867.16	\$380,000.00	\$380,000.00	\$380,000.00
9	7	\$2,361.93	9.5	9	14.75	\$3,318.61	\$3,188.95	\$4,794.45	\$375,929.28	\$375,760.60	\$378,493.33
10	8	\$2,456.41	9.75	9	14.5	\$3,381.95	\$3,188.95	\$4,723.00	\$371,635.48	\$371,123.52	\$376,667.51
11	9	\$2,554.66	10	9	14.25	\$3,444.18	\$3,188.95	\$4,652.96	\$367,086.90	\$366,051.44	\$374,465.75
12	10	\$2,656.85	10.25	9	14	\$3,505.22	\$3,188.95	\$4,584.46	\$362,247.64	\$360,503.57	\$371,823.49
13	11	\$2,763.12	10.5	9	13.75	\$3,564.98	\$3,188.95	\$4,517.68	\$357,076.92	\$354,435.28	\$368,667.84
14	12	\$2,873.65	10.75	9	13.5	\$3,623.37	\$3,188.95	\$4,452.76	\$351,528.19	\$347,797.73	\$364,917.01
15	13	\$2,988.59	11	9	13.25	\$3,680.26	\$3,188.95	\$4,389.88	\$345,548.14	\$340,537.54	\$360,479.80
16	14	\$3,108.14	11.25	9	13	\$3,735.55	\$3,188.95	\$4,329.19	\$339,075.44	\$332,596.29	\$355,255.12
17	15	\$3,232.46	11.5	9	12.75	\$3,789.12	\$3,188.95	\$4,270.87	\$332,039.35	\$323,910.09	\$349,131.66
18	16	\$3,361.76	11.75	9	12.5	\$3,840.82	\$3,188.95	\$4,215.07	\$324,357.97	\$314,409.07	\$341,987.61
19	17	\$3,496.23	12	9	12.25	\$3,890.53	\$3,188.95	\$4,161.97	\$315,936.16	\$304,016.79	\$333,690.51
20	18	\$3,636.08	12.25	9	12	\$3,938.08	\$3,188.95	\$4,111.71	\$306,663.10	\$292,649.65	\$324,097.21
21	19	\$3,781.52	12.5	9	11.75	\$3,983.32	\$3,188.95	\$4,064.46	\$296,409.28	\$280,216.18	\$313,054.05
22	20	\$3,932.79	12.75	9	11.5	\$4,026.06	\$3,188.95	\$4,020.37	\$285,022.93	\$266,616.37	\$300,397.13
23	21	\$4,090.10	13	9	11.25	\$4,066.11	\$3,188.95	\$3,979.57	\$272,325.66	\$251,740.81	\$285,952.80
24	22	\$4,253.70	13.25	9	11	\$4,103.29	\$3,188.95	\$3,942.23	\$258,107.21	\$235,469.81	\$269,538.33

In all three scenarios, this type of mortgage is worse for the Wongs than the hybrid loan; in particular, their payments in Scenario 3 would jump to more than double what they can afford at the start of the sixth year.

Negative Amortization Loan: Again, the only change in the worksheet is the computation of the payments for the first 5 years. This time, the loan amortizes negatively during the initial 5-year period, so the payment formula in this period is adjusted to reflect this

```
=-PMT(C3/1200,360,I$3*0.6).
```

	A	B	C	D	E	F	G	H	I	J	K
1	Year	28% of Monthly Income		Interest Rate			Monthly Payment			Balance on Principal	
2			Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
3	1	$1,866.67	4.7	4.7	4.7	$1,182.49	$1,182.49	$1,182.49	$380,000.00	$380,000.00	$380,000.00
4	2	$1,941.33	4.7	4.7	4.7	$1,182.49	$1,182.49	$1,182.49	$383,750.17	$383,750.17	$383,750.17
5	3	$2,018.99	4.7	4.7	4.7	$1,182.49	$1,182.49	$1,182.49	$387,680.45	$387,680.45	$387,680.45
6	4	$2,099.75	4.7	4.7	4.7	$1,182.49	$1,182.49	$1,182.49	$391,799.48	$391,799.48	$391,799.48
7	5	$2,183.74	4.7	4.7	4.7	$1,182.49	$1,182.49	$1,182.49	$396,116.32	$396,116.32	$396,116.32
8	6	$2,271.09	9.25	9	15	$3,431.01	$3,362.16	$5,131.53	$400,640.49	$400,640.49	$400,640.49
9	7	$2,361.93	9.5	9	14.75	$3,498.87	$3,362.16	$5,054.87	$396,348.66	$396,170.82	$399,051.98
10	8	$2,456.41	9.75	9	14.5	$3,565.64	$3,362.16	$4,979.54	$391,821.64	$391,281.87	$397,127.00
11	9	$2,554.66	10	9	14.25	$3,631.26	$3,362.16	$4,905.69	$387,025.99	$385,934.29	$394,805.64
12	10	$2,656.85	10.25	9	14	$3,695.62	$3,362.16	$4,833.48	$381,923.88	$380,085.08	$392,019.86
13	11	$2,763.12	10.5	9	13.75	$3,758.62	$3,362.16	$4,763.06	$376,472.30	$373,687.17	$388,692.80
14	12	$2,873.65	10.75	9	13.5	$3,820.18	$3,362.16	$4,694.62	$370,622.18	$366,689.09	$384,738.24
15	13	$2,988.59	11	9	13.25	$3,880.16	$3,362.16	$4,628.32	$364,317.31	$359,034.55	$380,060.01
16	14	$3,108.14	11.25	9	13	$3,938.46	$3,362.16	$4,564.34	$357,493.03	$350,661.95	$374,551.54
17	15	$3,232.46	11.5	9	12.75	$3,994.93	$3,362.16	$4,502.85	$350,074.77	$341,503.95	$368,095.48
18	16	$3,361.76	11.75	9	12.5	$4,049.45	$3,362.16	$4,444.02	$341,976.15	$331,486.86	$360,563.39
19	17	$3,496.23	12	9	12.25	$4,101.85	$3,362.16	$4,388.03	$333,096.90	$320,530.10	$351,815.60
20	18	$3,636.08	12.25	9	12	$4,151.99	$3,362.16	$4,335.05	$323,320.15	$308,545.52	$341,701.22
21	19	$3,781.52	12.5	9	11.75	$4,199.68	$3,362.16	$4,285.23	$312,509.37	$295,436.71	$330,058.23
22	20	$3,932.79	12.75	9	11.5	$4,244.74	$3,362.16	$4,238.74	$300,504.55	$281,098.20	$316,713.83
23	21	$4,090.10	13	9	11.25	$4,286.97	$3,362.16	$4,195.73	$287,117.60	$265,414.64	$301,484.92
24	22	$4,253.70	13.25	9	11	$4,326.17	$3,362.16	$4,156.36	$272,126.84	$248,259.85	$284,178.86
25	23	$4,423.85	13.5	9	10.75	$4,362.10	$3,362.16	$4,120.77	$255,270.30	$229,495.82	$264,594.34
26	24	$4,600.80	13.75	9	10.5	$4,394.53	$3,362.16	$4,089.09	$236,237.47	$208,971.60	$242,522.55

Clearly the Wongs should steer clear of this type of loan in order to be able to continue to afford making payments!

In short, it seems unlikely that the Wongs will be able to afford payments on any of the three mortgages in question, and you decide to advise them to either seek a less expensive home or wait until their income has appreciated to enable them to afford a home of this price.

EXERCISES

1. In the case of a hybrid loan, what would the federal funds rate have to be in Scenario 2 to ensure that the Wongs can afford to make all payments?
2. Repeat the preceding exercise in the case of an interest-only loan.
3. Repeat the preceding exercise in the case of a negative-amortization loan.
4. What home price, to the nearest $5,000, could the Wongs afford if they took out a hybrid loan, regardless of scenario? HINT [Adjust the original value of the loan on your spreadsheet to obtain the desired result.]
5. What home price, to the nearest $5,000, could the Wongs afford if they took out a negative-amortization loan, regardless of scenario? HINT [Adjust the original value of the loan on your spreadsheet to obtain the desired result.]
6. How long would the Wongs need to wait before they could afford to purchase a $400,000 home, assuming that their income continues to increase as above, they still have $20,000 for a down payment, and the mortgage offers remain the same?