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APPENDIX K TO PART 226—TOTAL ANNUAL LOAN COST RATE COMPUTATIONS FOR REVERSE MORTGAGE TRANSACTIONS

(a) *Introduction.* Creditors are required to disclose a series of total annual loan cost rates for each reverse mortgage transaction. This appendix contains the equations creditors must use in computing the total annual loan cost rate for various transactions, as well as instructions, explanations, and examples for various transactions. This appendix is modeled after Appendix J of this part (Annual Percentage Rates Computations for Closed-end Credit Transactions); creditors should consult Appendix J of this part for additional guidance in using the formulas for reverse mortgages.

(b) *Instructions and equations for the total annual loan cost rate*—(1) *General rule.* The total annual loan cost rate shall be the nominal total annual loan cost rate determined by multiplying the unit-period rate by the number of unit-periods in a year.

(2) *Term of the transaction.* For purposes of total annual loan cost disclosures, the term of a reverse mortgage transaction is assumed to begin on the first of the month in which consummation is expected to occur. If a loan cost or any portion of a loan cost is initially incurred beginning on a date later than consummation, the term of the transaction is assumed to begin on the first of the month in which that loan cost is incurred. For purposes of total annual loan cost disclosures, the term ends on each of the assumed loan periods specified in §226.33(c)(6).

(3) *Definitions of time intervals.*

(i) A *period* is the interval of time between advances.

(ii) A *common period* is any period that occurs more than once in a transaction.

(iii) A *standard interval of time* is a day, week, semimonth, month, or a multiple of a week or a month up to, but not exceeding, 1 year.

(iv) All months shall be considered to have an equal number of days.

(4) *Unit-period.* (i) In all transactions other than single-advance, single-payment transactions, the unit-period shall be that common period, not to exceed one year, that occurs most frequently in the transaction, except that:

(A) If two or more common periods occur with equal frequency, the smaller of such common periods shall be the unit-period; or

(B) If there is no common period in the transaction, the unit-period shall be that period which is the average of all periods rounded to the nearest whole standard interval of time. If the average is equally near two standard intervals of time, the lower shall be the unit-period.

(ii) In a single-advance, single-payment transaction, the unit-period shall be the term of the transaction, but shall not exceed one year.

(5) *Number of unit-periods between two given dates.* (i) The number of days between two dates shall be the number of 24-hour intervals between any point in time on the first date to the same point in time on the second date.

(ii) If the unit-period is a month, the number of full unit-periods between two dates shall be the number of months. If the unit-period is a month, the number of unit-periods per year shall be 12.

(iii) If the unit-period is a semimonth or a multiple of a month not exceeding 11 months, the number of days between two dates shall be 30 times the number of full months. The number of full unit-periods shall be determined by dividing the number of days by 15 in the case of a semimonthly unit-period or by the appropriate multiple of 30 in the case of a multimonthly unit-period. If the unit-period is a semimonth, the number of unit-periods per year shall be 24. If the number of unit-periods is a multiple of a month, the number of unit-periods per year shall be 12 divided by the number of months per unit-period.

(iv) If the unit-period is a day, a week, or a multiple of a week, the number of full unit-periods shall be determined by dividing the number of days between the two given dates by the number of days per unit-period. If the unit-period is a day, the number of unit-periods per year shall be 365. If the unit-period is a week or a multiple of a week, the number of unit-periods per year shall be 52 divided by the number of weeks per unit-period.

(v) If the unit-period is a year, the number of full unit-periods between two dates shall be the number of full years (each equal to 12 months).

(6) *Symbols.* The symbols used to express the terms of a transaction in the equation set forth in paragraph (b)(8) of this appendix are defined as follows:

A_j=The amount of each periodic or lump-sum advance to the consumer under the reverse mortgage transaction.

i=Percentage rate of the total annual loan cost per unit-period, expressed as a decimal equivalent.

j=The number of unit-periods until the jth advance.

n=The number of unit-periods between consummation and repayment of the debt.

P_n=Min (Bal_n, Val_n). This is the maximum amount that the creditor can be repaid at the specified loan term.

Bal_n=Loan balance at time of repayment, including all costs and fees incurred by the consumer (including any shared appreciation or shared equity amount) compounded to time n at the creditor's contract rate of interest.

$Val_n=Val_0 (1 + \sigma)^y$, where Val_0 is the property value at consummation, σ is the assumed

annual rate of appreciation for the dwelling, and y is the number of years in the assumed term. Val_n must be reduced by the amount of any equity reserved for the consumer by agreement between the parties, or by 7 percent (or the amount or percentage specified in the credit agreement), if the amount required to be repaid is limited to the net proceeds of sale.

σ = The summation operator.

Symbols used in the examples shown in this appendix are defined as follows:

$FV_{x\neg}i$ = The future value of 1 per unit period for x unit periods, first advance due immediately (at time = 0, which is consummation).

$$= \sum_{j=0}^{x-1} (1+i)^{x-j}$$

$$= (1+i)^{x} + (1+i)^{x-1} + \cdots (1+i)^{1}; \text{ or}$$

$$= \frac{(1+i)^{n} - 1}{i} \times (1+i)$$

w=The number of unit-periods per year.

I=wi×100=the nominal total annual loan cost rate.

(7) *General equation.* The total annual loan cost rate for a reverse mortgage transaction must be determined by first solving the following formula, which sets forth the relationship between the advances to the consumer and the amount owed to the creditor under the terms of the reverse mortgage agreement for the loan cost rate per unit-period (the loan cost rate per unit-period is then multiplied by the number of unit-periods per year to obtain the total annual loan cost rate I; that is, I = wi):

$$\sum_{j=0}^{n-1} A_j (1+i)^{n-j} = P_n$$

(8) *Solution of general equation by iteration process.* (i) The general equation in paragraph (b)(7) of this appendix, when applied to a simple transaction for a reverse mortgage loan of equal monthly advances of $350 each, and with a total amount owed of $14,313.08 at an assumed repayment period of two years, takes the special form:

$$P_n = 350\ FV_{24\neg}\ i, \text{ or}$$

$$P_n = 350 \times \left[\frac{(1+i)^{n} - 1}{i} \times (1+i) \right]$$

Using the iteration procedures found in steps 1 through 4 of (b)(9)(i) of Appendix J of this part, the total annual loan cost rate, correct to two decimals, is 48.53%.

(ii) In using these iteration procedures, it is expected that calculators or computers will be programmed to carry all available decimals throughout the calculation and that enough iterations will be performed to make virtually certain that the total annual loan cost rate obtained, when rounded to two decimals, is correct. Total annual loan cost rates in the examples below were obtained by using a 10-digit programmable calculator and the iteration procedure described in Appendix J of this part.

(9) *Assumption for discretionary cash advances.* If the consumer controls the timing of advances made after consummation (such as in a credit line arrangement), the creditor must use the general formula in paragraph (b)(7) of this appendix. The total annual loan cost rate shall be based on the assumption that 50 percent of the principal loan amount is advanced at closing, or in the case of an open-end transaction, at the time the consumer becomes obligated under the plan. Creditors shall assume the advances are made at the interest rate then in effect and that no further advances are made to, or repayments made by, the consumer during the term of the transaction or plan.

(10) *Assumption for variable-rate reverse mortgage transactions.* If the interest rate for a reverse mortgage transaction may increase during the loan term and the amount or timing is not known at consummation, creditors shall base the disclosures on the initial interest rate in effect at the time the disclosures are provided.

(11) *Assumption for closing costs.* In calculating the total annual loan cost rate, creditors shall assume all closing and other consumer costs are financed by the creditor.

(c) *Examples of total annual loan cost rate computations*—(1) *Lump-sum advance at consummation.*

Lump-sum advance to consumer at consummation: $30,000

Total of consumer's loan costs financed at consummation: $4,500

Contract interest rate: 11.60%

Estimated time of repayment (based on life expectancy of a consumer at age 78): 10 years

Appraised value of dwelling at consummation: $100,000

Assumed annual dwelling appreciation rate: 4%

P_{10} = Min (103,385.84, 137,662.72)

$$30{,}000(1+i)^{10-0} + \sum_{j=0}^{9} 0(1+i)^{10-j} = 103{,}385.84$$

i = .1317069438
Total annual loan cost rate (100(.1317069438 × 1)) = 13.17%

(2) *Monthly advance beginning at consummation.*

Monthly advance to consumer, beginning at consummation: $492.51
Total of consumer's loan costs financed at consummation: $4,500
Contract interest rate: 9.00%
Estimated time of repayment (based on life expectancy of a consumer at age 78): 10 years
Appraised value of dwelling at consummation: $100,000
Assumed annual dwelling appreciation rate: 8%

$$P_{120} = \text{Min}\,(107{,}053.63,\ 200{,}780.02)$$

$$492.51 \times \left[\frac{(1+i)^{120} - 1}{i} \times (1+i) \right] = 107{,}053.63$$

$$i = .009061140$$

Total annual loan cost rate (100(.009061140 × 12))=10.87%

(3) *Lump sum advance at consummation and monthly advances thereafter.*

Lump sum advance to consumer at consummation: $10,000
Monthly advance to consumer, beginning at consummation: $725
Total of consumer's loan costs financed at consummation: $4,500
Contract rate of interest: 8.5%
Estimated time of repayment (based on life expectancy of a consumer at age 75): 12 years
Appraised value of dwelling at consummation: $100,000
Assumed annual dwelling appreciation rate: 8%

$$P_{144} = \text{Min}\,(221{,}818.30,\ 234{,}189.82)$$

$$10{,}000(1+i)^{144-0} + \sum_{j=0}^{143} 725(1+i)^{144-j} = 221{,}818.30$$

$$i = .007708844$$

Total annual loan cost rate (100(.007708844 × 12)) = 9.25%

(d) *Reverse mortgage model form and sample form*—(1) *Model form.*

TOTAL ANNUAL LOAN COST RATE

Loan Terms

Age of youngest borrower:
Appraised property value:
Interest rate:
Monthly advance:
Initial draw:
Line of credit:

Initial Loan Charges

Closing costs:
Mortgage insurance premium:
Annuity cost:

Monthly Loan Charges

Servicing fee:

Other Charges:

Mortgage insurance:
Shared Appreciation:

Repayment Limits

Assumed annual appreciation	Total annual loan cost rate			
	2-year loan term	[ ]-year loan term]	[ ]-year loan term	[ ]-year loan term
0%		[ ]		
4%		[ ]		
8%		[ ]		

The cost of any reverse mortgage loan depends on how long you keep the loan and how much your house appreciates in value. Generally, the longer you keep a reverse mortgage, the lower the total annual loan cost rate will be.

This table shows the estimated cost of your reverse mortgage loan, expressed as an annual rate. It illustrates the cost for three [four] loan terms: 2 years, [half of life expectancy for someone your age,] that life expectancy, and 1.4 times that life expectancy. The table also shows the cost of the loan, assuming the value of your home appreciates at three different rates: 0%, 4% and 8%.

The total annual loan cost rates in this table are based on the total charges associated with this loan. These charges typically include principal, interest, closing costs, mortgage insurance premiums, annuity costs, and servicing costs (but not costs when you sell the home).

The rates in this table are estimates. Your actual cost may differ if, for example, the amount of your loan advances varies or the interest rate on your mortgage changes.

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TOTAL ANNUAL LOAN COST RATE

Loan Terms

Age of youngest borrower: 75
Appraised property value: $100,000
Interest rate: 9%
Monthly advance: $301.80
Initial draw: $1,000
Line of credit: $4,000

Initial Loan Charges

Closing costs: $5,000
Mortgage insurance premium: None
Annuity cost: None

Monthly Loan Charges

Servicing fee: None

Other Charges

Mortgage insurance: None
Shared Appreciation: None

Repayment Limits

Net proceeds estimated at 93% of projected home sale

(2) Sample Form.

Assumed annual appreciation	Total annual loan cost rate			
	2-year loan term	[6-year loan term]	12-year loan term	17-year loan term
0%	39.00%	[14.94%]	9.86%	3.87%
4%	39.00%	[14.94%]	11.03%	10.14%
8%	39.00%	[14.94%]	11.03%	10.20%

The cost of any reverse mortgage loan depends on how long you keep the loan and how much your house appreciates in value. Generally, the longer you keep a reverse mortgage, the lower the total annual loan cost rate will be.

This table shows the estimated cost of your reverse mortgage loan, expressed as an annual rate. It illustrates the cost for three [four] loan terms: 2 years, [half of life expectancy for someone your age,] that life expectancy, and 1.4 times that life expectancy. The table also shows the cost of the loan, assuming the value of your home appreciates at three different rates: 0%,4% and 8%.

The total annual loan cost rates in this table are based on the total charges associated with this loan. These charges typically include principal, interest, closing costs, mortgage insurance premiums, annuity costs, and servicing costs (but not disposition costs—costs when you sell the home).

The rates in this table are estimates. Your actual cost may differ if, for example, the amount of your loan advances varies or the interest rate on your mortgage changes.

SIGNING AN APPLICATION OR RECEIVING THESE DISCLOSURES DOES NOT REQUIRE YOU TO COMPLETE THIS LOAN

[Reg. Z, 60 FR 15474, Mar. 24, 1995, as amended at 60 FR 50400, Sept. 29, 1995]

APPENDIX L TO PART 226—ASSUMED LOAN PERIODS FOR COMPUTATIONS OF TOTAL ANNUAL LOAN COST RATES

(a) *Required tables.* In calculating the total annual loan cost rates in accordance with Appendix K of this part, creditors shall assume three loan periods, as determined by the following table.

(b) *Loan periods.*

(1) Loan Period 1 is a two-year loan period.

(2) Loan Period 2 is the life expectancy in years of the youngest borrower to become obligated on the reverse mortgage loan, as shown in the U.S. Decennial Life Tables for 1979–1981 for females, rounded to the nearest whole year.

(3) Loan Period 3 is the life expectancy figure in Loan Period 3, multiplied by 1.4 and rounded to the nearest full year (life expectancy figures at .5 have been rounded up to 1).

(4) At the creditor's option, an additional period may be included, which is the life expectancy figure in Loan Period 2, multiplied by .5 and rounded to the nearest full year (life expectancy figures at .5 have been rounded up to 1).

Age of youngest borrower	Loan period 1 (in years)	[Optional loan period (in years)]	Loan period 2 (life expectancy) (in years)	Loan period 3 (in years)
62	2	[11]	21	29
63	2	[10]	20	28
64	2	[10]	19	27
65	2	[9]	18	25
66	2	[9]	18	25
67	2	[9]	17	24
68	2	[8]	16	22
69	2	[8]	16	22
70	2	[8]	15	21
71	2	[7]	14	20
72	2	[7]	13	18
73	2	[7]	13	18
74	2	[6]	12	17
75	2	[6]	12	17
76	2	[6]	11	15
77	2	[5]	10	14
78	2	[5]	10	14
79	2	[5]	9	13
80	2	[5]	9	13
81	2	[4]	8	11
82	2	[4]	8	11
83	2	[4]	7	10
84	2	[4]	7	10
85	2	[3]	6	8
86	2	[3]	6	8
87	2	[3]	6	8
88	2	[3]	5	7
89	2	[3]	5	7
90	2	[3]	5	7
91	2	[2]	4	6
92	2	[2]	4	6
93	2	[2]	4	6
94	2	[2]	4	6
95 and over	2	[2]	3	4

[60 FR 15476, Mar. 24, 1995]

SUPPLEMENT I TO PART 226—OFFICIAL STAFF INTERPRETATIONS

INTRODUCTION

1. *Official status.* This commentary is the vehicle by which the staff of the Division of Consumer and Community Affairs of the Federal Reserve Board issues official staff interpretations of Regulation Z, as revised effective April 1, 1981. Good faith compliance with this commentary affords protection from liability under 130(f) of the Truth in Lending Act. Section 130(f) (15 U.S.C. 1640) protects creditors from civil liability for any act done or omitted in good faith in conformity with any interpretation issued by a duly authorized official or employee of the Federal Reserve System.