

PRESENT VALUE OF FUTURE CASH FLOWS

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TABLE OF CONTENTS

Executive Summary	3
When to use Present Value of Future Cash Flows	4
How to Calculate Present Value	5
Calculating Present Value Example	7
Conclusion	11
About Sageworks & the Author	12
Additional Resources	13

EXECUTIVE SUMMARY

Loans identified as impaired, using the guidance outlined in the [OCC Bank Accounting Advisory Series](#), must be evaluated individually using one of three prescribed methods: present value of cash flows, fair value of collateral or observable market price. Unfortunately for many institutions, there are questions about how and when to use two of those valuation methods in order to determine the impairment and a potential reserve: [present value of cash flows](#) and [fair value of collateral](#). When there is uncertainty in a calculation, it leaves room for scrutiny among regulators and auditors.

This whitepaper will outline how to calculate the present value of future cash flows with visual examples.

WHEN TO USE PRESENT VALUE OF FUTURE CASH FLOWS

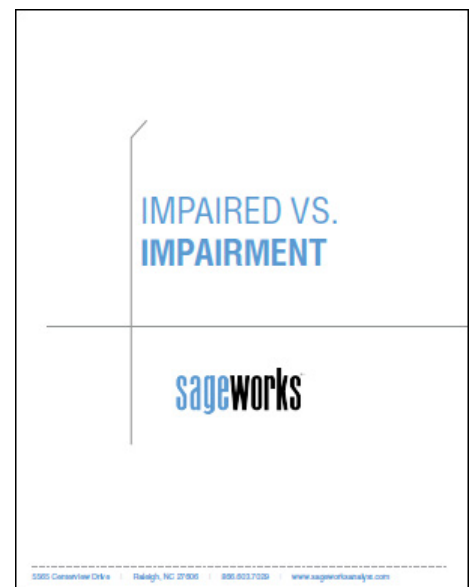
Once a loan has been deemed [impaired](#), the method selected to determine the impairment should default to the present value of cash flows unless there is collateral that will pay 100 percent of amounts due to the bank. Further, according to the FASB Statement of Financial Accounting Standards No. 114, banks should use “fair value of collateral when the creditor determines that foreclosure is probable.” Banks may try to convince themselves to use a collateral method for convenience, even if the borrower continues to pay. If the loan is cash flowing even with collateral, present value of cash flows must be used to determine the impairment. Any liquidation proceeds net of selling costs would be used to supplement cash flow.

Additional Whitepaper Resource

Although many institutions believe “impaired” and “impairment” are one and the same, they in fact have very different meanings within the allowance for loan and lease losses (ALLL) calculation.

Download this whitepaper to learn:

- The difference between “impaired” and “impairment”
- How to identify impaired loans
- How to calculate impairment using the three methods



HOW TO CALCULATE PRESENT VALUE

Effective Interest Rate

There are three primary components of a present value calculation:

- The effective interest rate
- The expected monthly payment
- The remaining term

The current effective interest rate is used as the discount factor to determine present value, but there are two instances where this may change. If the loan in question is a [troubled debt restructuring \(TDR\)](#), the effective interest rate would be the original contractual rate and not the current restructured rate. The other instance is applicable if the loan is a variable rate; then the bank can either use the rate in effect at the time of each calculation, or use the rate in effect when the loan was deemed impaired. It is important when valuing variable rate loans that the method used is consistently applied to all loans.

Expected Monthly Payments

The [expected monthly payment](#) is the variable on which present value is being calculated for purposes of determining the impairment and a potential reserve. This amount is not necessarily the monthly scheduled principal and interest, but is the amount the institution believes it will receive each month based on “reasonable and supportable assumptions and projections.” The expected monthly payment may change over the remaining term, with some payments due quarterly or periodically. There may also be a final balloon payment or an estimated amount that may reflect the sale of collateral (net of any selling costs). When setting up the present value calculation, care should be taken to identify each monthly payment correctly, taking into account any

HOW TO CALCULATE PRESENT VALUE (CONT.)

payment variations and seasonality throughout the remaining term of the loan. Each subsequent impairment calculation should involve an analysis to determine if any of the expected monthly payments or their timing may have changed from the previous projection. Any changes should be added to the present value calculation to determine a new impairment amount.

Remaining Term

The remaining term of the loan is the time variable of the present value calculation and may default to the difference between the date of the impairment calculation and the maturity date of the loan in terms of months, but no more. The remaining term could also reflect a shorter term to reflect the sale of collateral or even an early payoff. If a term shorter than maturity is initially elected, subsequent impairment calculations should involve the shorter term unless verifiable situations change, such as the cancellation of a collateral sale or a payoff. [Supporting documentation](#) that accompanies each calculation is important before making any change to the remaining term.

Once all of the components of a present value of cash flows are collected and confirmed, they must be compiled into the actual calculation. Whether a spreadsheet or an [automated solution](#) is used, consistent reasoning and documentation must accompany each calculation. As noted earlier, a present value calculation could be a simple, straightforward calculation or it could be a complex payment analysis and may need to include amortization days.

CALCULATING PRESENT VALUE EXAMPLE

An example of a simple present value calculation:

Accrued interest is the interest that has accumulated since the principal investment, or since the previous interest payment if there has been one already.

Net deferred loan fees or costs are certain fees and other direct costs associated with originating loans over the life of the loan as an adjustment of yield, net of any related fees received.

Unamortized premium or discount is the premium or discount (excess or shortfall of the loan's price as compared to its selling value) that remains to be written off against expenses over the loan's life (maturity period).

Customer Name:

Loan Number:

Current Balance:

Accrued Interest:

Net Deferred Loan Fees or Costs:

Unamortized Premium or Discount:

Total Recorded Investment:

Impairment Date:

Loan Type:

Effective Interest Rate:

Remaining Term in Months:

Expected Monthly Payment:

Amortization Days:

Loan Information

American Building Co.

275148005-10

\$ 900,000.00

\$ 1,680.00

\$ 2,220.00

\$ 0.00

\$ 903,900.00

5/22/2012 

Fixed Payment ▼

5.000% C

12

\$ 60,000.00

360 ▼

The example loan above has a current balance of \$900,000, net of any charge-offs, supplemented by accrued interest and additional fees of \$3,900 for a total recorded investment of \$903,900. According to the FASB, accrued interest -- net deferred fees or costs and any unamortized premium or discount -- should be added to the loan balance with the assumption that these amounts are owed to the bank. The results of the present value analysis are on the following page.

CALCULATING PRESENT VALUE

EXAMPLE CONT.

Cash Flow Details:
Schedule of expected payments assuming no seasonality or balloon payments.

Cash Flow Details		
<u>Payment Date</u>	<u>Expected Payment</u>	<u>Present Value</u>
11/30/2014	\$ 60,000.00	\$ 59,747.59
12/31/2014	\$ 60,000.00	\$ 59,496.25
1/31/2015	\$ 60,000.00	\$ 59,245.96
2/28/2015	\$ 60,000.00	\$ 58,996.73
3/31/2015	\$ 60,000.00	\$ 58,748.54
4/30/2015	\$ 60,000.00	\$ 58,501.40
5/31/2015	\$ 60,000.00	\$ 58,255.30
6/30/2015	\$ 60,000.00	\$ 58,010.23
7/31/2015	\$ 60,000.00	\$ 57,766.20
8/31/2015	\$ 60,000.00	\$ 57,523.19
9/30/2015	\$ 60,000.00	\$ 57,281.20
10/31/2015	\$ 60,000.00	\$ 57,040.24


Reserve Calculations	
<u>Total Recorded Investment:</u>	\$ 903,900.00
<u>Valuation Amount:</u>	\$ 700,612.83
<u>Reserve Amount:</u>	\$ 203,287.17

CALCULATING PRESENT VALUE EXAMPLE CONT.

In the case on the previous page, the \$60,000 in monthly payments promised to the bank over 12 months is not sufficient to repay the bank on a present value basis. This results in a reserve of \$203,287.17. This example is one that may reflect a borrower trying to repay a loan, maybe without many other obligations.

The example below reflects a borrower whose repayment reflects a structured payment schedule with seasonality and a balloon payment.

Loan Information

Customer Name:	Generic Motors, LLC 95
Loan Number:	275170501-50
Current Balance:	\$ 726,002.92
Accrued Interest:	\$ 0.00
Net Deferred Loan Fees or Costs:	\$ -7,393.00
Unamortized Premium or Discount:	\$ 0.00
Total Recorded Investment:	\$ 718,609.92
Impairment Date:	2/1/2011 
Loan Type:	Fixed Payment ▼
Effective Interest Rate:	7.000%
Remaining Term in Months:	22
Expected Monthly Payment:	\$ 17,290.00
Amortization Days:	Actual 360 ▼

Net deferred loan fees or costs are certain fees and other direct costs associated with originating loans over the life of the loan as an adjustment of yield, net of any related fees received.

Current Interest Rate: 5.000%

CALCULATING PRESENT VALUE

EXAMPLE CONT.

Cash Flow Details

Payment Date	Expected Payment	Present Value
11/30/2014	\$ 0.00	\$ 0.00
12/31/2014	\$ 17,290.00	\$ 17,083.43
1/31/2015	\$ 0.00	\$ 0.00
2/28/2015	\$ 0.00	\$ 0.00
3/31/2015	\$ 17,290.00	\$ 16,778.19
4/30/2015	\$ 0.00	\$ 0.00
5/31/2015	\$ 0.00	\$ 0.00
6/30/2015	\$ 17,290.00	\$ 16,503.91
7/31/2015	\$ 18,500.00	\$ 17,525.97
8/31/2015	\$ 18,500.00	\$ 17,420.96
9/30/2015	\$ 18,500.00	\$ 17,353.44
10/31/2015	\$ 18,500.00	\$ 17,212.82
11/30/2015	\$ 18,500.00	\$ 17,152.74
12/31/2015	\$ 18,500.00	\$ 17,007.17
1/31/2016	\$ 19,200.00	\$ 17,544.93
2/29/2016	\$ 19,200.00	\$ 17,548.03
3/31/2016	\$ 19,200.00	\$ 17,335.31
4/30/2016	\$ 19,200.00	\$ 17,291.51
5/31/2016	\$ 19,200.00	\$ 17,128.20
6/30/2016	\$ 19,200.00	\$ 17,091.52
7/31/2016	\$ 19,200.00	\$ 16,923.56
8/31/2016	\$ 425,000.00	\$ 372,365.59

Reserve Calculations

Total Recorded Investment:	\$ 718,609.92
Valuation Amount:	\$ 647,267.28
Reserve Amount:	\$ 71,342.64

CONCLUSION

Using present value of cash flows to determine the impairment does not need to be a difficult determination. Unless collateral is the institution's sole source of repayment or there is a market price for the loan, the bank or credit union should use present value of cash flows. Regulators will test the institution based on this logic. As with any impairment calculation, it is also important that each variable and each change to those variables (effective interest rate, expected monthly payment and term) are properly identified and documented. Expected monthly payment tends to change from time to time as the financial situation of the borrower changes. It will be prudent to revisit each cash flow loan monthly and check with the workout officer for updates. A properly thought out and documented cash flow calculation will result in an accurate and defensible calculation to stand up to regulator and auditor scrutiny.

ABOUT SAGEWORKS & THE AUTHOR

Sageworks (www.sageworks.com) is a financial information company working with financial institutions, accountants and private-company executives across North America to collect and interpret financial information. Thousands of bankers rely on Sageworks' credit risk management solutions to streamline credit analysis, risk rating, [portfolio stress testing](#), loan administration and [ALLL calculation](#). Sageworks is also an industry thought leader, regularly publishing [whitepapers](#) and hosting webinars on topics important to bankers.

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ALLL

[Sageworks ALLL](#) is the premiere automated solution for estimating a financial institution's reserve. It helps bankers automate their

ALLL process and increase consistency in their methodology, making it defensible to auditors and examiners. Sageworks' risk management consultants also assist clients with the implementation of their ALLL models and guidance interpretation. To find out more, visit www.sageworksanalyst.com.

Robert Ashbaugh is a senior risk management consultant at Sageworks and is responsible for assisting financial institutions with their ALLL and stress testing programs. Rob has more than twenty years of capital markets and commercial banking experience as both a portfolio manager and risk manager, with a primary focus on mortgage-backed securities and commercial loans. Among his responsibilities were monthly ALLL calculations, institutional and concentration stress testing and risk analytics. He is a past holder of the Series 7, 52 and 63 licenses. Rob received his bachelor's degree in both economics and international business from Temple University.

ADDITIONAL RESOURCES

“The Complete Guide to the ALLL,” *Sageworks*.

<http://web.sageworks.com/complete-guide-ALLL-reserves/>

“ALLL Glossary,” *Sageworks*.

<http://web.sageworks.com/alll-glossary/>

Bogan, Emily, “‘Impaired’ and ‘Impairment’: Is There a Difference?,” *Sageworks*.

<http://web.sageworks.com/impaired-impairment/>

“FAS 114 Impairment Analysis Worksheet,” *Sageworks*.

<http://web.sageworks.com/federal-fas-114-reserve-all-policy-impairment-analysis/>

“Is your institution properly testing for impaired loans?,” *Sageworks*.

<http://www.alll.com/resource-center/proper-testing-for-impaired-loans/>

McPeak, Tim and Garrett Morris. “TDR 101: “ALLL” About Troubled Debt Restructurings Webinar,” *Sageworks*.

<http://www.alll.com/resource-center/webinar-tdr-101-alll-about-troubled-debt-restructurings/>

Morris, Garrett and Chuck Nwokocho. “How to Calculate Your FAS 114 Reserves,” *Sageworks*.

<http://web.sageworks.com/fas-114-reserves/>