SECTION FOUR
DEBT SERVICE COVERAGE RATIO

The previous Section thoroughly covered Income and Expense
on commercial real estate. Once the Net Operating Income (No1) is
accurately calculated it is then used to determine an actual loan
amount the Income Property supports. Lenders use two Ratios to
determine the amount of loan an Income Property can support. The
first ratio is called the Debt Service Coverage Ratio and the second is
the Loan to Value Ratio.

The Debt Service Coverage Ratio (DSCR) is becoming the most important ratio among most
Income Property lenders. The first Section of the Workbook mentioned the implications of
overbuilding and high vacancy rates. These factors are making lenders look very closely at the
property's cash flow and ability to service the payments on the loan. The primary way of
calculating this ability is the Debt Service Coverage Ratio.

When lenders calculate Net Operating Income, they assume a certain percentage of the NOI is
available to service the debt on the property. If a property has an annual NOI of $120,000., this
would be the maximum amount the property could support in annual payments on debt. If a loan
is made with annual payments of $120,000 this would be a 1.0 to 1.0 DSCR. In other words
every dollar of income is used to service debt.

However lenders want an additional comfort level in case there are any changes in either the
Net Operating Income of the property, interest rates, or other economic factors. This is why
lenders seldom make a loan with payments in excess of the total amount of NOI.

The DSCR is always stated in terms of a number in relation t1.0. For example a 1.15 to 1.0 Debt
Service Coverage Ratio would mean there is $1.15 of income on the property for every $1.00 of
payments. On the example on the previous page the property has an Annual NOI of $120,000.
($10,000 monthly). The lender may prefer a 1.20 to 1.0 Debt Service Coverage Ratio ($1.20 of
income for every $1.0 of payments). By dividing the Net Operating Income by
the Debt Service Coverage Ratio, the amount of loan payments the property can support is
calculated. This formula can calculate either annual loan payments or monthly payments.

Here is the calculation:
$129,090. Annual NOI = $100,000 Annual Amount for Debt Service

1.20 DSCR

Here is one more example:

A property has an annual NOI of $60,000. The lender prefers a
1.10/1.0 DSCR. What amount annually is available for debt service on this Income Property?

559.9552 Annual NOI = $54,545 Annual Amount for Debt Service
1.10 DSCR

In the next two examples, calculate the amount of funds available to service debt.

Problem #1: A property has an Annual NOI of $150,000. The lender in this example uses a 1.25/1.0 DSCR. What amount annually is available for Debt Service?

$150,000 Annual NOI/1.25 DSCR = $_____Available for Debt Service Annually

Problem #2: A property has an Annual No1 of $75,000. The
 lender uses a 1.20/1.0 DSCR. What amount annually is available for Debt Service?

$75,000 Annual NOI/1.20 DSCR = $_____ Available for Debt Service Annually

Simply by changing the Debt Service Coverage Ratio, a lender can adjust the amount of lendable funds available on an income property. This is what many lenders have done recently. At onetime Income Property Lenders were willing to use a DSCR on Income Property of very liberal guidelines of 1.10/1.0 or sometimes less. Then because of concerns about overbuilding, rising interest rates and potential losses, the lenders changed to more conservative 120/10 and higher Debt Service Coverage Ratios.

Here is an example of the results of changing the DSCR, and its effect on the amount of funds available to service the debt on the property:

Example:

An Income Property has an Annual NOI of $180,000. The lender reviews the credit request and quotes a loan amount based on a 1.10/1.0 DSCR.

Calculations:
$180,000 Annual NOI/1.10 DSCR = $163,636 Amount Available for Debt Service

Because of lender concern about high vacancy in the area of the subject property and possible increasing interest rates, the lender approaches the loan request more conservatively. The lender now decides a 1.25/1.0 DSCR is more realistic. How much does this affect the amount of funds available to service the debt?

Calculations:
$180,000 Annual NOI/1.25 DSCR = $144,000 Amount Available for Debt Service

In this example the Income Property generated the same income, however the lender changed the ratio used for calculating the loan amount available. The annual amount available for Debt Service changed by $19,636, which means a substantial difference in the amount of lendable funds available on the property.

It is very important to remember that an increase in the Debt
Service Coverage Ratio (Example: from 1.10/1.0 DSCR to a 1.25/1.0

DSCR) decreases the amount of lendable funds available on the property. Conversely a decrease: (Example: from 1.25/1.0 DSCR to a 1.10/1.0 DSCR) in the Debt Service Coverage Ratio increases the amount of funds available on the property.

Now it should become apparent how important the calculation of the NOI is. By reviewing the Income and Expenses of the property and arriving at an accurate NOI, the lender can calculate the amount of loan available to any Income Property.

There are two methods for calculating loan amounts using Net Operating Income and Debt Service Coverage Ratios. The first method is the use of a Mortgage Constant and the Annual NOI. The second uses a monthly NQI, and a financial calculator to figure loan amounts. In this Section both ways of calculating loan amounts are shown, with examples and problems.

The first way a lender can calculate the loan amount available on an Income Property is the use of a Constant Annual Percentage called the Mortgage Constant. The Mortgage Constant is the percentage ratio between the annual debt service and the loan percentage. A simple formula for calculating the Mortgage Constant is:

Annual Debt Service/ Loan Principle = Mortgage Constant

Example:

$1,000,000 Loan Amount at 10% for 30 Years. Calculate the Mortgage Constant:

Monthly Payments: $8,775.72

Annual Payments: $105,308.

$105,308 (Annual Debt Service)/ $1,000,000 Principal Loan Amount = 10.53 Mortgage Constant

The actual mathematic formula for calculating a Mortgage Constant is an involved formula, but this is an easy way to calculate the Mortgage Constant. Fortunately most Real Estate Mathematics and Real Estate Appraisal Books provide Mortgage Constants for different interest rates and loan terms.

Included at the end of this Section is a Table of Mortgage Constants for 15, 20, 25 and 30 year loans. For all the problems using an Annual NOI to calculate the available loan amount, please refer to this table.

Example: An Income Property has an Annual Net Operating Income of $200,000. The lender uses a 1.25/1.0 DSCR and offers a 30 year Amortized loan. at 10%. Here is how to calculate the loan amount available on this Income Property:

Step 1: Divide the NOI by the lenders preferred DSCR:

 $160,000/1.25 DSCR = Available to Service Debt Annually

Step 2: Find the Mortgage Constant for 10%, 30 Year Loan:

Referring to the Table at the end of this Section you find a
Mortgage Constant of 10.53 for a 30 Year, 10% Loan. When using the
Mortgage Constant to calculate a loan amount always remember that it is expressed as a
percentage.

Step 3; Divide the amount available for Debt Service by the

$160,000 Available for Debt Service/ .1053 Mortgage Constant= $1,519,468 Loan amount

By using this formula the lender knows the Income Property
qualifies for a loan of $1,519,500, (rounded).

Now try several more examples until you feel confident using
this method of determining loan amounts on Income Properties.

Problem #3 : An Income Property has an Annual No1 of $15000.
The lender uses a 1.25/1.0 DSCR, and offers a 30 Year loan at
10.25%. What loan amount is available on this Income Property?

Calculations;

$150,000 Annual NOI/1.25 DCSR = $ Available for Debt Service
5.1mm =$_ _ Available for Debt Service

$___Available for Debt Service/Mortgage Constant = $ _ Amount of Loan

Problem #4: An Income Property has an Annual NOI of $300,000.
The lender uses a 1.10/1.0 DSCR, and offers a 30 Year loan at
10.25%. What is the loan amount available on this Income Property?

Calculations;

$300,000 Annual NOI/1.10 DSCR = $ Available for Debt Service

$ Available for Debt Service/Mortgage Constant = $ Amount of Loan

Problem #7: Income Property has an Annual NOI of $500,000.
The lender uses a 1.25/1.0 DSCR, and offers a 25 year loan at
11.0%. Calculate the loan amount available on this Income
Property?

Calculations:

$500,000 Annual NOI/1.25 DSCR = $ Available for Debt Service

There are several more examples at the end of this Section allowing you to do more of these problems until you are completely confident working with these important calculations.

Some lenders use a different method of calculating the amount of loan an Income Property can support. This is especially true for the lenders who adjust their rates frequently or are concerned about the monthly cash flow of the property. For example a loan may be tied to Prime Rate as an Index, and the property's cash flow is not established or is seasonal. This method is useful to calculate the effect on a monthly basis of any change in rate or income on the ability of the property to service the debt.

In the first example in this Section a property has an annual NOI of $120,000 or a mum of $10,000. If the lender uses a 1.10/1.0 Debt Service Coverage Ratio, the lender would take the Monthly NOI and divided it by 1.10 DSCR.

Example:

$112,990 Monthly NOI=$9,090 Available for Debt Service Monthly 1.10 DSCR

Then by the use of a financial calculator a loan amount available on the property is calculated. (This calculation is illustrated in the supplement on the use of the Hewlett Packard 12 C")

In this example if the lender used a 10% Interest Rate, with a 30 year term, the amount of loan can be calculated on a financial calculator. The payment amount is known, as well as the interest rate and term.

Step 1: Payment amount: $9,090

Step 2: Interest Rate: 10

Step 3: Term: 30 Years

Step 4: Calculate Loan Amount

Loan Amount; $1,035,916

In most cases a lender uses the 1.1 0/1.0 DSCR as the lowest Debt Service Coverage Ratio acceptable. Usually a DSCR of this amount would be considered very aggressive and only the prime Income Properties with stable income would merit this low a DSCR.

In the present market most lenders would consider a more conservative 1.15-1.25/1.0 DSCR. By simply adjusting the DSCR the lender can become more conservative or aggressive in the way they approach Income Property Lending.

Problem #6: On the previous example, the property had a monthly NOI of $10,000. If a lender chose a slightly more cautious approach, then a 1.15 or 1.20/1.0 DSCR could be used.

How will this change the loan amount available on the Property?

Calculations:

$10,000 (Monthly NOI) / 1.15 DSCR = $8,695

Again using a financial calculator, with this amount as the payment and an Interest Rate of 10%, and a 30 Year Term, what loan amount is available on this property?

Payment Amount: $8,695

Interest Rate: 10%

Term: 30 Years

Loan Amount:

This changes the loan amount available on the property from an original loan amount of_____ using a 1.10/1.0 DSCR to a loan of _____ using a 1.15/1.0 DSCR.

Problem #7: Now using the same example, what is the new amount of loan available on the property using a more conservative DSCR of 1.20/1.0?

Calculations

$10,000 (Monthly NOI)/1.20 DSCR = $8,333

Payment Amount: $8,333

Interest Rate: 10%

Term: 30 Years

Loan Amount:

With some very simple steps on the financial calculator, a lender can take the Net Operating Income and using an appropriate Debt Service Coverage Ratio quickly determine an acceptable loan amount The previous examples served to illustrate that simply by changing the DSCR the lender can reduce the loan size and the risk on the property.

Debt Service Coverage Ratios range between a more aggressive 1.10/ 1.0 DSCR, to more cautious ratios of 1.20 and 1.25/1.0 DSCR. This figure depends on many factors, including the lender's attitude about the borrower's experience, the type and age of the property, its income and of course the economic outlook and interest rates. If a lender is concerned about the economy slowing or either an increase interest rates or increasing vacancy rates in the area, then by changing the Debt Service Coverage Ratio a more conservative figure is used.

In the latter part of 1986 and early 1987 many lenders would go to a low DSCR of 1.10/1.0 on quality properties and experienced borrowers. However rising interest rates and concerns about overbuilding caused many lenders to change their DSCR to 1.15/1.0, then later to 1.20/1.0 DSCR. At the present time nearly all lenders are using a more cautious approach on the Debt Service Coverage Ratio.

This ratio is very important to understand, especially with lenders concern about cash flow on the property. Here are a few more examples that give you practice in using a financial calculator to calculate a loan amount when the NOI of a property is known. In all the examples, use a 30 Year amortization and a 10% interest Rate.

Problem #8: Annual Net Operating Income of $240,000 and a DSCR of 1.15/1.0

Calculating

Annual NOI $240,000/12 Months=$20,000 Monthly NOI

$20,000 Monthly NOI/1.15 DSCR = $ Payment Amount= 3 Payment Amount
1.15 DSCR

Payment Amount:$_____

Interest Rate: 10%

Term: 30 Years

Loan Amount: $_____

Problem #9: On this same example the lender changes the DSCR to a more conservative 1.25/1.0 DSCR. What will the new loan amount be?

Calculations:
$20,000 Monthly NOI/1.25 DSCR: $_____ Payment Amount

Payment Amount:_____

Interest Rate: 10%

Term: 30 Years

Loan Amount: $_____

Problem #10:

 In this final example the Debt Service Coverage Ratio is used when a borrower inquires about a loan on his apartment complex. He states the property's Actual Effective Gross Income was $300,000 for last year. His expenses are 40% of his Gross Income. The DSCR the lender uses ranges from a 1.15-1.25/1.0 DSCR depending on the property. In the first example the lender

uses a 1.15/1.0 DSCR and in the second example a 1.25/1.0 DSCR. What different loan amounts are available to the borrower it a 30 year loan, and a 10 % Interest Rate? Calculations:

Annual Gross Income: $300,000   Gross Income: $300,000
          X40% Expenses   (Less) Expenses $ _____

Annual Expenses: $_____   Annual NOI:_____

Annual NOI $_____ /12 Months = $ Monthly NOI_____

Monthly NOI/1.15 DSCR =$ _____   Payment Amount

Payment Amount: $_____
Interest Rate: 10%

Term: 30 Years

Loan Amount: $_____

On this same example use a 1.25/1.0 DSCR:
Monthly NOI $ /1.25 DSCR- =$ Payment Amount

Payment Amount: $

Interest Rate: 10%

Term: 30 Years

Loan Amount: $

SUMMARY:

The use of Debt Service Coverage Ratios to calculate loan amounts is one of the basic fundamentals of Income Property Lending. Along with Net Operating Income, they form the basics of qualifying any Income Property for a loan amount. The last part of this Section tried to show how a change in the Debt Service Coverage Ratio substantially changes I the amount of loan available on an Income Property.

Lenders change their Debt Service Coverage Ratios in response to many factors in the Commercial Real Estate marketplace. 'The present trend is for lenders to take a more cautious approach and raise the Debt Service Coverage Ratio in response to concerns about the economy.

There are more problems to solve at the end of this section on Debt Service Coverage Ratios and loan calculations. It is important to be very familiar with the different ways of calculating loan amounts and the use of Debt Service Coverage Ratios.

QUESTIONS:
1. Using Mortgage Constants calculate the following loan amounts:

Lender rate 10.5%, 25 year amortization, DSCR of 1.10/1.0.
Annual NOI of $160,000.

Rate: 10.5%
Term: 25 years
Annual NOI: $160,000
DSCR: 1.10/1.0
Available for Debt Service:_____
Mortgage Loan Constant:_____
Loan Amount:_____

2. Lender rate 9.75%, 30 year amortization, DSCR 1.25/1.0,
Annual NOI of $200,000.

Rate: 9.75%
Term: 30 years
Annual NOI: $200,000
DSCR: 1.25/1.0
Available for Debt Service:_____
Mortgage Loan Constant:_____
Loan Amount:_____

3. Lender rate of 9.5%, 20 year amortization, DSCR
1.30/l.0, Annual No1 of $100,000.

Rate: 9.5%
Term: 20 years
Annual NOI: $100,000
DSCR: 1.30/l.0
Available for Debt Service:_____
Mortgage Loan Constant: _____
Loan Amount: $ _____

Using a Financial Calculator, calculate the following loan amounts:

4. Lender rate of 11%, 30 year amortization, DSCR of
1.20/1.0, monthly NOI of $13,000.

Rate: 11%
Term: 30 years
Monthly NOI: $13,000
DSCR: l.20/l.0
Available for Debt Service: $_____
Monthly Payments$_____

Loan Amount:$_____

5. Lender rate 9.75%, 25 year amortization, DSCR of
1.15/1.0, monthly NOI of $15,000.

Rate: 9.75%
Term: 25 years
Monthly NOI: $15,000
DSCR: 1.15/1.0
Available for Debt Service:_____
Monthly Payments_____
Loan Amount:_____

I DELETED QUESTIONS 6-10 TOO MANY FOR TEST. PLEASE ADD ANSWERS TO THIS
SET NOTHING CHANGED EXCEPT QUESTIONS 6-10 ARE DELETED

MORTGAGE LOAN CONSTANT CHART MUST BE ADDED SEE PAGE AFTER 77
LAST PAGE (BELOW) NEEDS TO BE DONE IN EXCEL/A MICROSOFT WORD TABLE. It is
the mortgage constant