

Hancock Timber RESEARCH Note

Publication Reference N-01-2

Relating Cash Flow and Total Return: Do Properties with Lower Near-Term Cash Flows Produce Higher Total Returns?

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January 2001

Conventional wisdom among the timberland investment community suggests that timberland properties with a relatively low cash yield in the near term provide a relatively high total return. A return premium is thought to be required to compensate investors for the risks (less liquidity and more uncertainty about asset value) of holding such properties. Indeed, at least one timberland investment firm has created a fund designed to capture a return premium associated with young plantations.

To the best of our knowledge, this conventional wisdom has never been tested empirically. In this Research Note, we use data from Hancock Timber Resource Group (HTRG) properties to do so. Our results were surprising. We did not observe any meaningful relationship between expected near-term cash yields and total returns for properties in the South. In the Pacific Northwest and Northeast, we actually found that a total return *discount* was associated with lower near-term cash yields.

Methodology

The relationship between projected near-term cash flow and total return was examined in two ways. First, we calculated the correlation coefficients between projected internal rates of return and average annual cash yields over five and 10 years. We followed this examination with multiple linear regression to further define the relationships.

We examined correlations for 79 HTRG properties using our Winter 2000 Hancock Timber Investment Model (TIM) data for each property. The sample included only U.S. properties that did not include debt and had a minimal amount of land sales in the investment model.

Two measures of low cash flow properties were examined. These were the average percentage cash flow-on-market value for the first five and 10 years. The 79 properties were separated into three regions: Northeast (12 properties), Pacific Northwest (14 properties) and South (53 properties). In the South, additional analysis reduced the number of properties in some cases. The properties excluded in the additional analysis were five properties that were either held as timber deeds or had a substantial portion (40%+ of market value) of timberland leases in place.

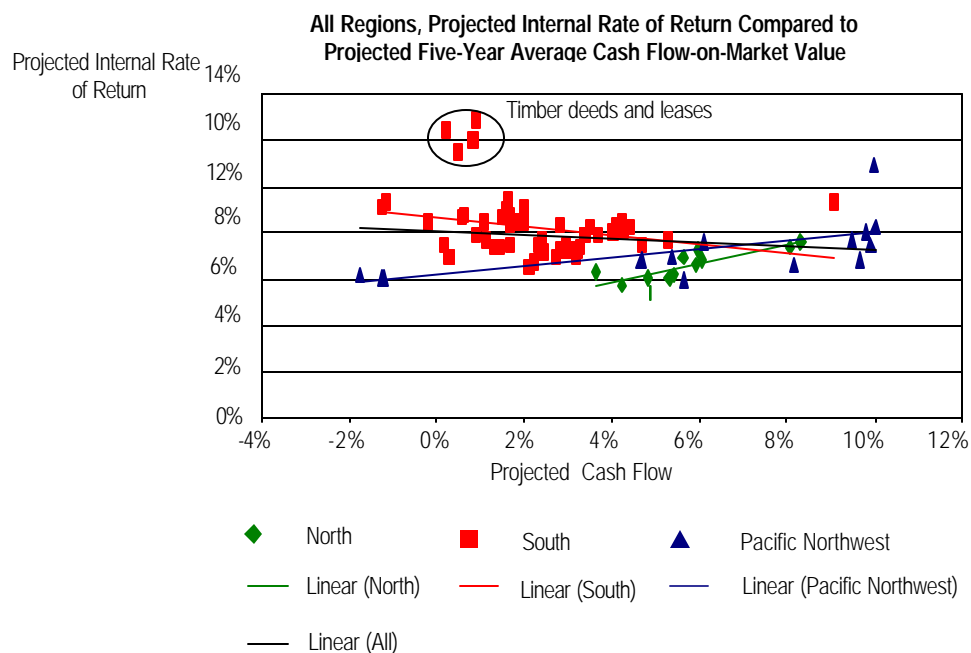
Multiple linear regression analysis was conducted to more precisely determine the relationship between projected IRR and various property attributes, including projected cash flow-on-market value.

Correlation Results

If properties with relatively low cash yields are indeed priced to generate higher total returns, we would expect the correlation between projected IRR and cash yields to be negative. Overall correlation results between projected total return and yield were found to be positive, or close to zero, depending on the region.

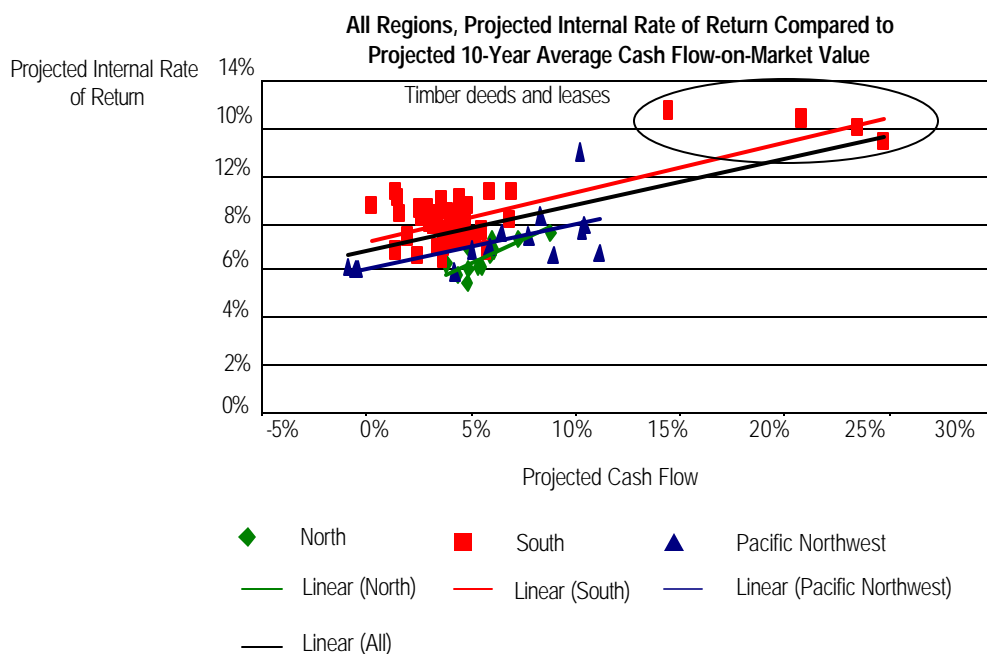
Five-Year Cash Yields

When all 79 properties are included, the correlation between the projected five-year average cash flow and total projected IRR is -0.18 . When timber deeds and leases are excluded (74 remaining properties), the correlation is 0.01 . Four of the five properties excluded are the outliers in the upper left-hand-quarter of the scatterplot below. This is the section of the scatterplot where low cash flow and high return properties appear. (In these four cases, projected total return exceeds 11 percent and projected average five-year cash flow-on-market value is under 1 percent). Timber deeds and timberland leases are likely, by their structure, to have low cash flows for many years, followed by high cash flows as the underlying contract reaches maturity.



10-Year Average Cash Flow-on-Market Value

When all 79 properties are included, the correlation between 10-year average cash flow and total return is 0.61. This is largely due to the liquidation of the three timber deeds and one leased property, shown on the chart below. When timber deeds and leases are excluded (74 properties), the correlation is 0.12.



Regional Correlation Analysis

Table 1 below shows correlation levels by region. In the Northeast and Pacific Northwest, high projected early cash flows have a strong positive correlation with high projected total return properties. In addition, the correlations were consistent whether cash flow was measured on a five- or 10-year period.

In the South, the correlations were strongly influenced by timber deeds and leases. When properties with substantial timber deeds and leases are removed, there was no correlation between projected IRR and cash flow. There was no correlation when cash flow was measured on either five- or 10-year periods.

Table 1. Correlation between projected total return and average cash flow-on-market value, 12/31/99.

Region	Number of Properties	5-Year Average	10-Year Average
Northeast	12	0.80	0.76
South	53	-0.25	0.76
South (without deeds and leases)	48	0.01	0.01
Pacific Northwest	14	0.63	0.62

Regression Analysis

A multiple linear regression analysis was used to model the relationship between projected cash flow and projected IRR.

The Winter 2000 TIM model analysis used five independent variables hypothesized to affect property returns and a response variable (IRR). The independent variables used in the regression model included:

- average cash flow-on-market values for years 1 to 5
- geographic region (in particular, the South and Pacific Northwest)
- whether the property contained 40 percent or more of the value in timber deeds or leases
- whether the property had a fiber supply agreement.

Data for the model came from the database of 79 HTRG properties.

Projected property IRRs were evaluated with the equation:

$$R = \alpha + \beta_1(P) + \beta_2(1 \text{ if a southern property, } 0 \text{ otherwise}) + \beta_3(1 \text{ if a Pacific Northwest property, } 0 \text{ otherwise}) + \beta_4(1 \text{ if timber deed and/or substantial timberland leases are present, } 0 \text{ otherwise}) + \beta_5(1 \text{ if a fiber supply agreement exists, } 0 \text{ otherwise}) + \varepsilon$$

where R represents IRR in percent; P is one-to five-year cash flow on market value for each property; α and β are the regression parameters; and ε is the error term. The model explained approximately 67 percent of the variation in projected IRR. The model taken as a whole was a significant predictor of IRR (F-statistic of 29.50 ($P < 0.01$)). Most of the independent variable coefficients in the model were statistically significant from zero. The model reflected reasonable, straightforward relationships between property attributes and projected IRR. Finally, the mean absolute deviation between predicted IRR and actual IRR for the 79 properties was 0.62.

Our results found that additional cash flow-on-market value adds to the projected IRR of a property (Table 2). In the model, the variable's coefficient indicates that each additional 100 basis points of cash flow-on-market value, all else held equal, increases the projected IRR of a property by 15 basis points.

Regional analysis found that, with all other variables held equal, a southern property's IRR was 195 basis points greater than a property in the Northeast (and 129 basis points greater than a property in the Pacific Northwest). For the Pacific Northwest, a property's IRR was 66 basis points greater than a northeastern property. The coefficient for the Pacific Northwest was just outside of the 95 percent significance level.

Table 2. Model Results

	1-5 year cash-on-market value (additional % return per 100 basis points of cash flow-on-market value)	Southern properties (additional % return per property)	Pacific Northwest properties (additional % return per property)	Timberland deeds and leases (additional % return per property)	Fiber supply agreement (additional % return per property)	Constant (additional % return per property)
coefficient	0.15 (0.042)	1.95 (0.316)	0.66 (0.333)	3.92 (0.413)	-0.32 (0.275)	5.69 (0.340)
t-statistic	3.675 ^a	6.170 ^a	1.978 ^b	9.496 ^a	-1.178 ^b	16.732 ^a

79 observations

Standard error in parenthesis

^a Statistically significant at the 1% level, two-tailed test, null=0

^b Not statistically significant at the 1% level, two-tailed test, null=0

We further examined the impact of both timber deeds and leases as well as fiber supply agreements. Timber deed properties or properties having a substantial proportion of leases were associated with substantially higher returns. In the model, the variable's coefficient indicates that, all else held equal, timber deeds or substantial leases increase projected returns by 392 basis points. The presence of a fiber supply agreement, all else held equal, was associated with an IRR that was 32 basis points lower. However, the coefficient was not statistically significant at the 95 percent level.

Conclusions

Our results show that there is little evidence of a return premium associated with buying and holding low cash flow properties. Instead, the evidence seems to support a premium related to buying and holding properties with higher initial cash flows. The findings vary in strength by region. In the Northeast and Pacific Northwest, higher near-term cash flows are strongly correlated with total return. In the South, there currently appears to be little or no correlation between projected cash flow and total return, particularly for typical HTRG properties.

The relationship between projected IRR and cash flow-on-market value was quantified using multiple linear regression analysis. Using current HTRG models and properties, each additional 1 percent of cash flow contributed 15 basis points of total return, all else held equal. Timber deeds and properties with substantial timberland leases emerged as the property type most likely to have an IRR premium. Deed and lease properties had a projected IRR approximately 400 basis points higher than other types of properties, all else held equal. Other types of encumbrances, such as fiber supply agreements, were not statistically significant.

There are several areas of additional analysis that might be useful. In particular, a closer examination of timber deeds and leases should be undertaken to better define the sources of total return premium that these types of assets may provide. The encumbrance itself may be the source of the higher-than-average return, rather than the low initial cash flows. It may also be useful to investigate whether the correlations and partial regression coefficients observed using today's TIM data are persistent through time.

About the Author

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Research Publications from the Hancock Timber Resource Group

Title	Date Published	Reference #
Relating Cash Flow and Total Return: Do Properties With Lower Near-Term Cash Flows Produce Higher Total Returns?	1/01	N-01-2
Taking Advantage of the Wholesale Discount for Large Timberland Transactions	2/00	R-00-1
Levering Timberland Investments: Consequences for Equity Returns	2/00	N-00-1
Dueling Views of Timberland in P&I: What's the Real Story?	2/00	B-00-1
Hancock Timberland Investor	Quarterly	

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