Hancock Timber RESEARCH *Brief*

Publication Reference # B-09-12

Timberland: A Natural Inflation Hedge

As we start to see an emergence out of the current global financial crisis, looking forward becomes an important yet daunting task. With central banks around the world utilizing monetary policy to combat the financial downturn, investors become mindful of potential future inflation. During uncertain financial times, seasoned investors turn to alternative assets as a source of stability and return.

Investments in timberland – the ownership of forestland property and the trees growing on them – have historically generated strong risk-adjusted returns (see Chart 1). Timberland returns are comprised of two components, "income" and "appreciation". The income return reflects the current cash distributions from operations, and depends primarily on timber prices and harvest levels. The appreciation component refers to the change in asset value. This component of return responds to changes in anticipated future income levels and to changes in how timberland markets capitalize those anticipated future income levels into current asset values.

While timberland's historically strong returns have included a meaningful cash component, timberland investments have also proven to be of relative low risk – as measured by volatility and correlation with the returns from other financial assets. And, in contrast to most financial assets, timberland has also been a good hedge against inflation, especially against unanticipated inflation.

The relationship over the past twenty years between U.S. price inflation and the returns for a sample of U.S. assets commonly found in a diversified portfolio is shown in Chart 2. Timberland has proven to have the highest positive correlation with inflation, next being private commercial real estate—represented here by the NCREIF Property Index.

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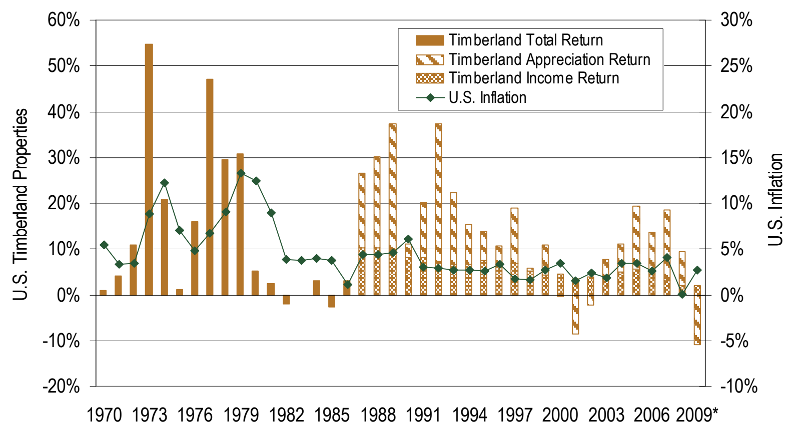
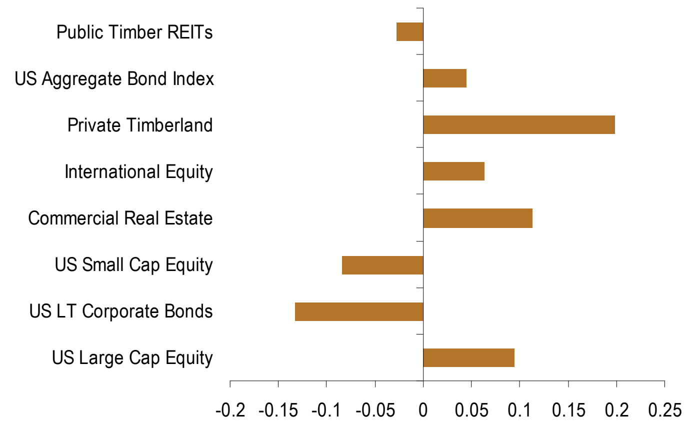
Chart 1: Timberland and Inflation - Annual Return (% per year)



*Timberland data from 1970 through 1986 based on Hancock Timberland Index. Data from 1987 - 2008 based on the NCREIF Timberland Property Index. Timberland data for 2009 are estimates by HTRG Research. Inflation data for 2009 based on the Consumer Price Index through 3Q 2009

Chart 2: Timberland - Inflation Correlation 1978 - 2008



*Analysis covers 1970 - 2009-year-to-date. Timberland data from 1987 - 2008 based on the NCREIF Timberland Property Index. Timberland data for 2009 are estimates by HTRG Research. Inflation and financial data for 2009 based on returns through 3Q 2009. Public Timber REIT is comprised of PCL and RYN , Commercial Real Estate data from NCREIF Property Index. Financial asset data sourced from Morningstar Encorr database.

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Following unprecedented events in financial markets over the recent past and the monetary policy responses as a reaction around the globe, a wide variation exists among investors on the expectations for price inflation going forward. One would agree though, all else equal, that investors prefer a portfolio with returns that are insensitive to departures from inflation expectations, what ever their expectations may be. As prudent investors hedge to insure against unexpected outcomes, we found it meaningful to measure the inflation-hedging properties of timberland along with a group of other assets. To do this, we examined the relationship between asset returns and expected inflation through 2008. We used an approach developed by Washburn and Binkley in 1993 where a basic two-factor model relating timberland returns to overall market returns and unanticipated inflation was employed.

The first calculation measures unanticipated inflation, computed here as the difference between realized U.S. consumer price inflation and a measure of expected inflation generated from regression analysis of short-term U.S. Treasuries. A combination of these results with the real rate of return realized for a given asset over time results in a model we can use to examine the relationship between asset returns and expected inflation (See *Note* below).

If the model parameter γ_2 is positive, than the asset has historically hedged higher-than-expected inflation. If an asset has historically hedged lower-than-expected inflation – a result prior empirical work found was the case for most financial assets – the parameter γ_2 is negative. Assets which are insensitive to departures from inflation expectations produce a γ_2 parameter of zero. The table below presents these results.

Timberland has been a strong hedge against unexpected inflation, with timberland in the U.S. Pacific Northwest performing particularly well in this regard ($\gamma_2 = +2.62$). Financial asset returns, on the other hand, have responded poorly to unanticipated inflation, all parameters proved negative. This implies that investors can, to some degree, immunize a mixed-asset portfolio against inflation surprises by investing in timberland. Such a portfolio can be formed by combining assets that hedge higher-than-expected inflation with those that hedge lower-than-expected inflation, structuring a portfolio whose value is insensitive to unanticipated inflation.

Table 1: Timberland - Statistical Inflation Correlation Analysis 1978 - 2008

	Timberland				Financial Assets				
Model Parameters	**U.S.**	**U.S. South**	**U.S. Pacific Northwest**	**U.S. Northeast**	**1-month U.S. Treasury Bills**	**5-Year U.S. Bonds**	**20-Year U.S. Bonds**	**Corporate Bonds**	**Small Stocks**
y_0	0.0032	0.0033	0.0033	0.0017	-0.0005	-0.0033	-0.0043	-0.0050	0.0009
	0.01534	0.010382	0.030483	0.009895	0.002237	0.010823	0.019885	0.016425	0.024888
y_1	-0.0667	-0.0929	-0.0502	-0.0004	-0.0146	-0.0088	-0.0268	0.0836	1.1368
	0.070306	0.047581	0.139708	0.045352	0.010252	0.049605	0.091137	0.075279	0.114066
$\mathbf{y_2}$	**1.8863***	**1.3443***	**2.6239***	**1.4242***	**-0.0735**	**-1.9367***	**-3.4170***	**-3.1922***	**-0.742**
	0.857552	0.580371	1.704078	0.553181	0.125043	0.60505	1.111635	0.918215	1.391317
Regression statistics									
DW	2.317	2.173	2.383	2.318	1.357	3.258	3.337	3.232	2.595
R^2	0.141	0.218	0.063	0.137	0.044	0.193	0.178	0.270	0.711

Note: Standard errors of the coefficient estimates are given below coefficient. An asterisk (*) indicates that the coefficient estimate is different from zero at the 0.10 level of statistical confidence.

Literature Cited:
Washburn, C.L., and C. S. Binkley. 1993. Do Forest assets Hedge Inflation? *Land Economics.* 69(August):215-24.

Note:
The relationship between asset returns and unexpected inflation was estimated by the model:
$R_{i,t} = y_{0i} + y_{1i}R_{m,t} + y_{2i}UI_t + \varepsilon_{i,t}$

Where:
$R_{i,t}$ = return from asset *i* in period *t*,
$R_{m,t}$ = "market" return in period t (measured here by the S&P 500).
UI_t = unexpected inflation in period *t*
$\varepsilon_{i,t}$ = an error term, assumed to be normal, and
y_{0i}, y_{1i}, y_{2i} = parameters to be estimated for each asset *i*.