Hancock
Timberland Investor

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A Manulife Asset Management Company

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Timberland Returns in an Environment of Rising Interest Rates

To what degree are timberland returns at risk as interest rates return to more normal levels?

In the wake of the last Global Financial Crisis (GFC), the Federal Reserve implemented the longest and most accommodating period of monetary policy in its history. Actions by the Federal Reserve included: holding the Fed Funds Rate (FFR) since December 2008 in a range between 0.00% and 0.25%; using the Term Asset Backed Securities Loan Facility (TALF), to lend up to $1 trillion to purchasers of asset backed securities between March 2009 and June 2010; and implementing a series of Quantitative Easing programs, whose purchases of securities have boosted the total assets on the Fed's balance sheet from $865 million in August 2007 to $4.3 trillion in May 2014.

With the economy now slowly recovering and unemployment moving closer to pre-recession levels, the Fed has shifted gears and started the process of "normalizing" monetary policy. The Fed is already well along on the process of "tapering" their bond purchase program, which will probably end this October, and the Fed has clearly signaled their intention to raise its targeted FFR sometime in 2015.

The move to tighter monetary policy in combination with an ongoing recovery in the overall economy has raised concerns among investors that the major expansion in bank reserves could fuel significant inflationary pressures and trigger a pronounced upward spiral in interest rates. The unprecedented nature of the Fed's accommodative actions post-GFC has placed us in relatively uncharted waters, and the possibility of a sustained, significant upward movement in interest rates cannot be completely dismissed. Consequently, evaluating the vulnerability of timberland returns to a period of rising interest rates is a timely exercise.

Our analysis focuses on a review of the performance of timberland assets in past periods of rising interest rates, first looking at the behavior of timberland returns during

periods of sustained increases in nominal interest rates. As institutional-sized timberland investments are not short-term, highly-liquid investments, we set a minimum duration criteria of two years of sustained increases in interest rates for a period to qualify. The yield on the 10 Year Treasury bond was used as the indicator of interest rate movements, and the measure of timberland returns used was the NCREIF Timberland Index in the period 1987 to 2013. Prior to 1987 the Hancock Timberland Index was employed as a measure of timberland returns[1].

Six periods since 1960 were identified in which nominal interest rates increased over the required two-year period: 1964-66; 1968-70; 1973-76; 1978-82; 1988-89; and 2004-07 (Chart 1). No consistent relationship is evident between increases in nominal interest rates and movements timberland returns.

**Chart 1: U.S. Nominal 10 Year Treasury Yields and Timberland Returns**
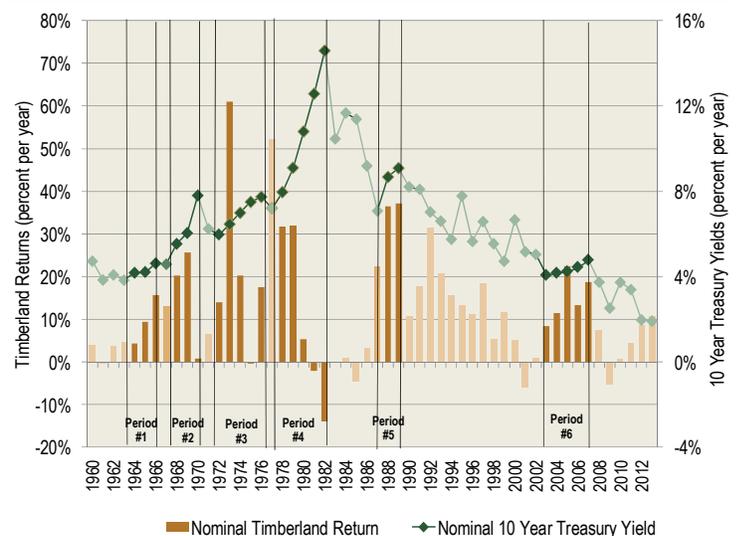
Note: Numbered periods highlight at least two years of sustained increases in nominal interest rates.
Sources: NCREIF, U.S. Treasury, HTRG Research

In four of the six periods, timberland returns trended higher along with interest rates (1964-66, 1968-70, 1988-89 and 2004-07). In three of the four instances, timberland returns suffered a significant setback in the first or second year following the end of the period, after interest rates had already changed direction and were heading lower. In the remaining two identified periods (1973-76 and 1978-82), timberland returns experienced pronounced downward corrections in the latter half or at the end of the period. This downward correction coincident with the upward movement in interest rates was most pronounced in 1978-1982, at the time when the Federal Reserve, under the leadership of Paul Volcker, aggressively pushed interest rates to extremely high levels for an extended period of time to combat double-digit inflation.

The lack of a direct causal relationship between the level of nominal interest rates and timberland returns is also illustrated in Chart 2, the scatter-plot of annual timberland returns and interest rates for the entire period 1960 to 2013. The fitted line for the scatter plot has an R-squared value approaching zero, indicating the limited statistical value of the level of interest rates as a predictor of timberland returns.

**Chart 2: Relationship Between Nominal U.S. 10 Year Treasuries and Timberland Returns**
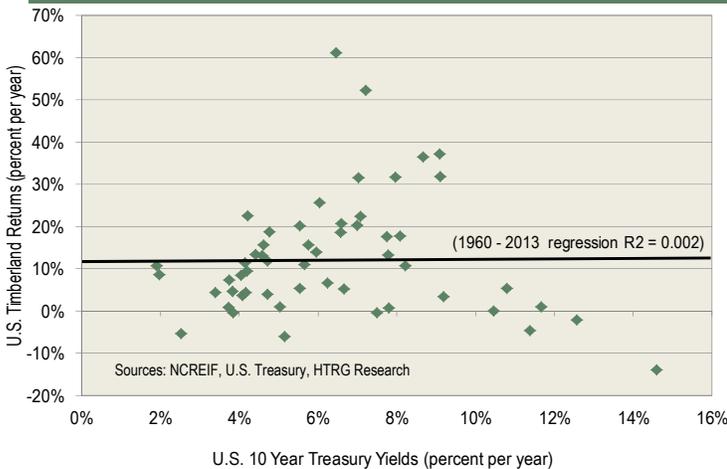
Finding no clearly quantifiable impacts on timberland returns related to rising nominal interest rates, we extended our analysis to inflation-adjusted interest rates.

Real timberland returns have been shown to have a significant positive correlation with inflation, (See 3Q 2013 *Hancock Timberland Investor – "A Historical Perspective on the Relationship between Timberland*

Returns and Inflation"). By filtering out the effects of inflation on the relationship between interest rates and timberland returns, we narrowed our analysis to those periods of increasing real interest rates which represent instances of true monetary tightening. Three periods of rising real interest rates meeting our criteria of a minimum duration of two years were identified: 1975-76, 1980-82, and 2000-01 (Chart 3).

Chart 3: U.S. Inflation-adjusted 10 Year Treasury Yields and Timberland Returns
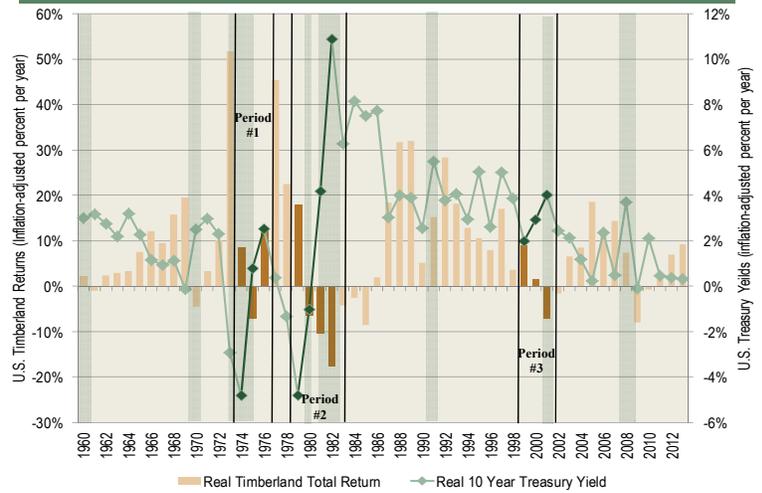
Note: Numbered periods highlight at least two years of sustained rises in real interest rates.
Shaded areas designate economic recessions
Sources: NCREIF, U.S. Treasury and HTRG Research.

All three of these periods of sustained increases in inflation-adjusted interest rates coincided with the occurrence of negative annual timberland returns (1975, 1980-82 and 2001), and each of these three periods overlapped with officially designated economic recessions (Chart 3 shaded areas designate economic recessions). In the period 1980-82, when real interest rates over the three year period increased by 15.7%, timberland registered an average inflation-adjusted annual return of -11.5%. In the other two periods, the increases in real interest rates were more moderate, and the corresponding negative impacts on timberland returns were milder (Table 1, page 6).

The chilling effect that sustained increases in real interest rates have had on timberland returns in the past is intuitively understandable. Aggressive tightening in monetary policy directly impacts growth in the overall economy, residential construction activity, and wood product demand. These negative market fundamentals can

Quarterly U.S. Housing Starts (1,000 units) and U.S. Softwood Lumber Composite Price Index (USD per MBF)

Sources: RISI, U.S. Bureau of Census

Quarterly Australian Dwelling Unit Approvals (1,000 units), Australian Softwood Lumber Composite Price Index and Softwood Stumpage Log Index

Sources: Australia Bureau of Statistics, KPMG and URS Timber Market Survey

Quarterly New Zealand softwood log export volume to China (million m3) and New Zealand radiata pine log import price (USD/m3 cif China)

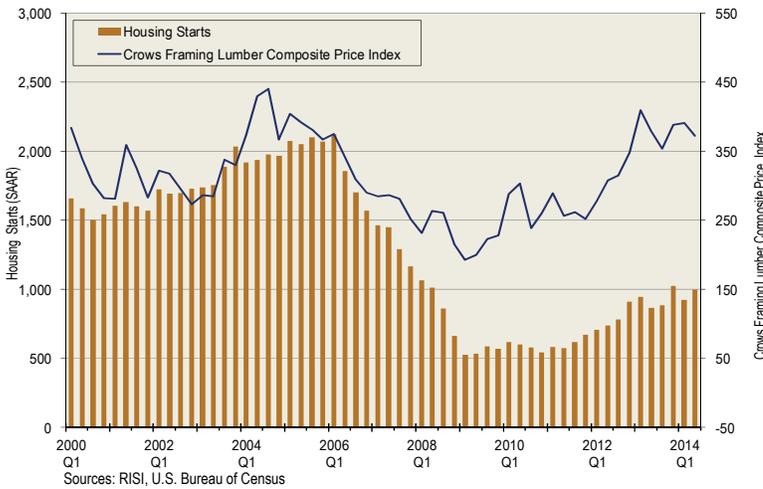Sources: RISI, International Wood Markets Inc.

Figure 1. North American Softwood Lumber Prices and U.S. Housing Starts

U.S. housing demand continues to build – albeit slower than was expected through the first half of 2014. Second quarter seasonally adjusted housing starts reached 997,000, 72,000 more than first quarter this year, 133,000 more than second quarter last year, and up 463,000 from the market's bottom in second quarter 2009. Lumber prices have also trended higher, up over 90% from the 2009 lows, but have mostly moved sideways over the past year. The Random Lengths Softwood Lumber Composite averaged $372 per MBF second quarter, a fall of $20 per MBF from last quarter and $8 per MBF below the Composite average in the second quarter of 2013.
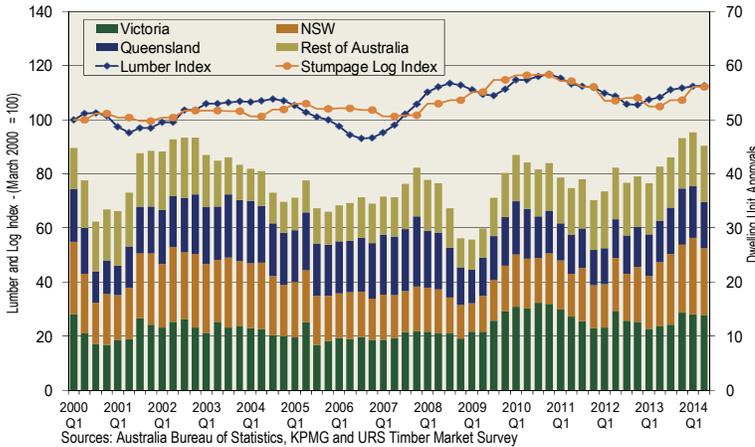
Figure 2. Australian Softwood Lumber, Timber Prices, Dwelling Unit Approvals

Building activity in Australia has picked up from the 2012 trough, with second quarter 2014 dwelling approvals up 20% over approvals in the second quarter of 2012, and 16% above second quarter approvals in 2013. Queensland and New South Wales have experienced the largest growth over the past two years. Australian structural lumber prices moved up 1% second quarter, the sixth consecutive quarter of growth. Australian timber prices, reported on a six month basis, rose 5% through June over the prior six months.

Figure 3. New Zealand Log Exports

An abrupt fall off of both New Zealand log volumes and New Zealand log prices into China occurred second quarter in reaction to reductions in Chinese residential building demand as credit and bank financing tightened, while roundwood inventories continued to build to an over supplied situation.

New Zealand export log prices delivered into China fell $20 per m3 on average second quarter over first quarter. Log supply from New Zealand to China dropped 440,000 m3, a 16% reduction from first quarter imports from New Zealand.

Monthly exchange rates between USD and Commodity Currencies

Exchange Rates (USD per Base Currency)

Legend:
- USD per 1 BRL
- USD per 1 NZD
- USD per 1 AUD
- USD per 6 CAD

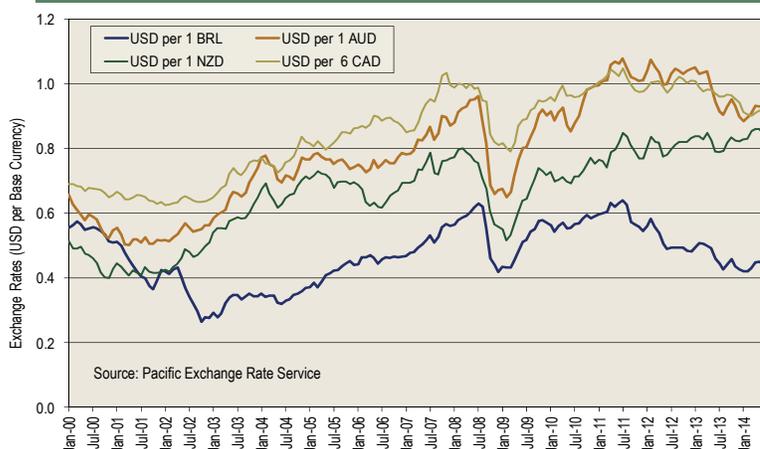Source: Pacific Exchange Rate Service

Figure 4. Exchange Rates
The value of four commodity currencies—The Australian Dollar, the Canadian Dollar, the New Zealand Dollar and the Brazilian Real—rose second quarter, yet the overall trend for the AUD, BRL and CAD has been a continued loss in value on what seems to be a determined downward path away from the peak rates of June 2011. New Zealand's quite favorable interest rates have held the New Zealand Dollar strong - trending in the opposite direction of its commodity-driven currency counterparts.

Quarterly Average Regional Composite Prices for Softwood Sawtimber Stumpage (USD per m3)

Legend:
- U.S. Pacific Northwest Domestic
- New Zealand Export
- U.S. South
- Australia Domestic

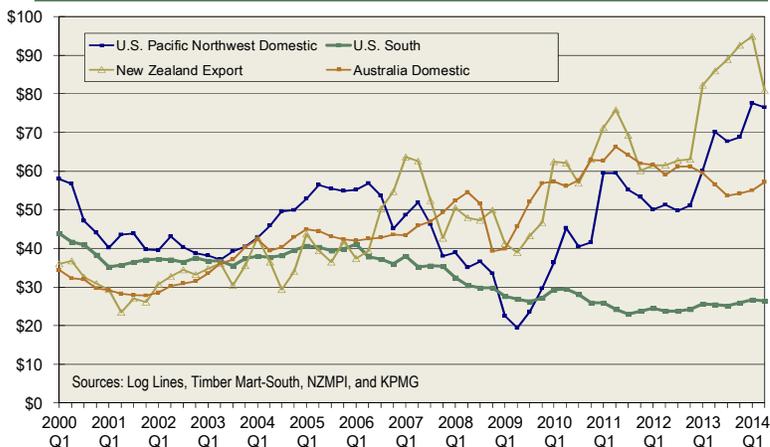Sources: Log Lines, Timber Mart-South, NZMPI, and KPMG

Figure 5. Regional Softwood Sawtimber Stumpage Prices
Prices for logs in Pacific Rim markets reacted to a slowdown in Chinese demand for residential building material while log and lumber supply continued to build. Prices for export logs fell 14% in New Zealand second quarter. Log prices in the U.S. Pacific Northwest were buoyed by U.S. domestic demand – with log prices experiencing a milder dip than in New Zealand, falling from $78 per m3 in the first quarter to $76 per m3 in the second quarter.   Timber prices in the U.S. South continue at historically low levels – with second quarter pine prices down slightly from first quarter, yet up $1 per m3 over second quarter prices last year. Australian timber prices, which report on a six month lagged basis, moved up 4% in U.S. Dollars during the first half of this year compared to last half of 2013.

Quarterly Prices for market pulp and fiber (USD per metric ton)

Market Pulp Prices

Delivered Pulpwood Prices

Legend:
- SBSK Market Pulp (USA)
- Southern Pine Pulpwood (USA)
- BEKP Market Pulp (Brazil)
- Eucalyptus Pulpwood (Brazil)

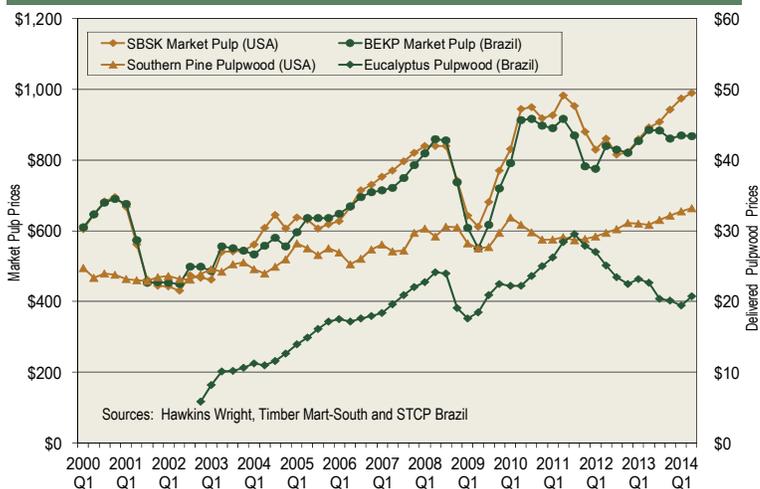Sources: Hawkins Wright, Timber Mart-South and STCP Brazil

Figure 6. Pulp and Pulpwood Prices, U.S. South and Brazil
Second quarter prices for Bleached Eucalyptus Kraft Pulp (BEKP) were flat, as Southern Bleached Softwood Kraft (SBSK) prices moved higher – widening the gap between pine and eucalyptus market pulp to $122 per tonne.   Pine pulpwood delivered prices in the U.S. South on the other hand moved sideways second quarter as Brazilian eucalyptus pulpwood prices in U.S. Dollars rose $1 per tonne. The small increase in Brazilian eucalyptus pulpwood prices in the second quarter interrupted a protracted downward correction which saw a 30% downward adjustment since the previous peak in third quarter 2011.

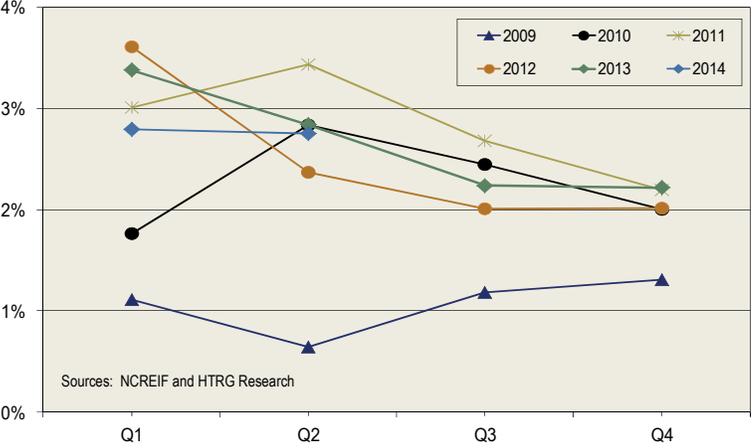## U.S. Timberland Annualized Operating Cash Yields (percent per year)

Figure 7. U.S. Timberland Annualized Operating Cash Yields (percent per year)
Annualized cash yields from U.S. timberland properties were 2.6% second quarter – slightly below first quarter yields. Regionally, cash yields from timberland in the U.S. Pacific Northwest fell .16% from first quarter. Cash yields from operating timberland in the U.S. South rose .09% from first quarter.

Monthly Securitized Timberland Share Value (Indexed to 100 at start date)
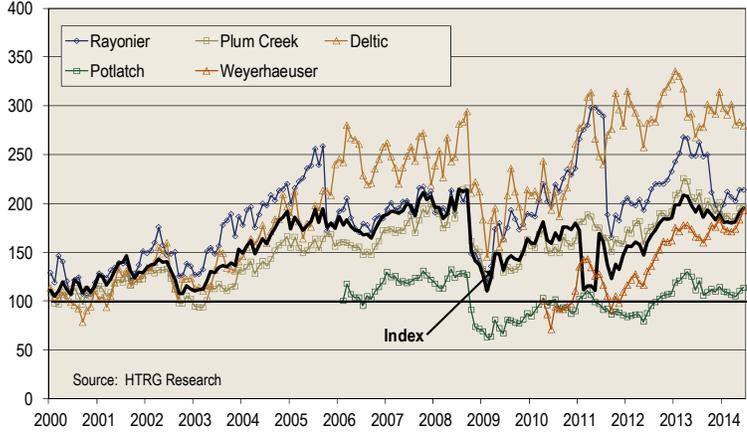

Figure 8. Hancock Securitized Timberland Index
The Hancock Securitized Timberland Index – a market-capitalization weighted public market performance Index rose 4.5 percent second quarter over first quarter, ending the quarter at about July 2013 Index levels and 6.0 percent below the Index peak back in March of 2013. Share prices for Weyerhaeuser, Potlatch, Rayonier, and Plum Creek moved the Index higher; whereas Deltic's small relative market capitalization kept its 7 percent drop in share price from moving the Index lower.

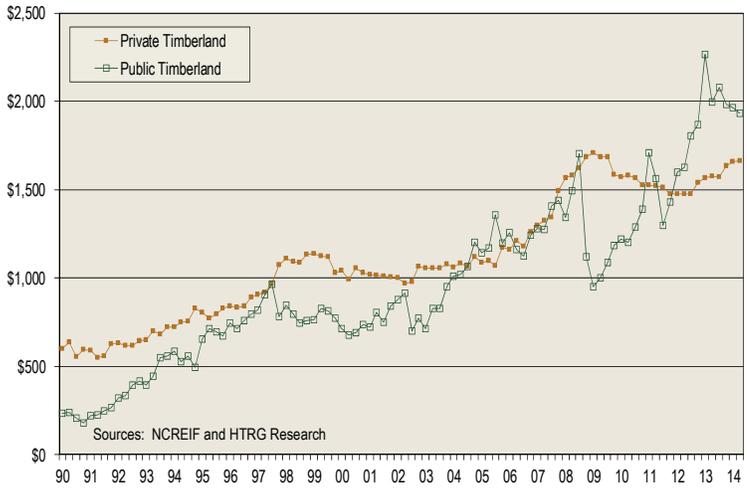## Quarterly U.S. South Timberland Values ($ per acre)

Figure 9. Timberland Enterprise Value
Southern U.S. timberland values fell for publicly traded REITS and rose for privately held investments second quarter, narrowing the value spread between public and private timberland assets to $265 per acre. The Timberland Enterprise Value per Southern Equivalent Acre (TEV/SEA) – a measure of Southern timberland value for public timber-intensive companies – has fallen $148 per acre over the past four quarters. In contrast, timberland held by private institutional investors – measured by the NCREIF Timberland Property Index in the U.S. South rose $94 per acre over the same time period.

Table 1: Average Timberland Returns During Periods of Rising Inflation-adjusted Interest Rates (percent)		
Period	Increase in Treasury Yields	Average Timberland Total Return
1975 - 76	7.34	2.60
1980 - 82	15.69	-11.54
2000 - 01	2.04	-2.84

Sources: NCREIF, U.S. Treasury and HTRG Research

quickly translate into an erosion in timberland returns. The negative timberland returns that occurred in these periods of rising real interest rates were directly related to the prevailing economic conditions.

The Fed's expected move to a less accommodative monetary policy and the corresponding rise in interest rates in of itself does not necessarily pose a major and immediate risk to timberland returns. To represent a significant threat to timberland performance, interest rates would need to rise at a pace substantially outpacing inflation sufficient to jeopardize the health of the overall economy and the current recovery in the housing market.

Given the lackluster and choppy progress of the U.S. economy to date and relatively little inflationary pressures, an aggressive tightening in monetary policy by the Fed

does not seem to be on the horizon. Further, the recent easing of commodity prices and the lowered growth expectations for the global economy have also reduced inflationary expectations in the medium term. A more probable scenario is that the Fed under Janet Yellen will continue to take a relatively guarded approach to normalizing monetary policy. This more benign scenario would be in-keeping with the Fed's recent policy statements and would constitute only a limited threat to timberland returns. 🌲

[1]Hancock Timberland Index calculates quarterly rates of return for timberland via the following standard formula:
Rate of Return$_t$ = [(Net Income$_t$ + Capital Value$_t$) / Capital Value$_{t-1}$] - 1
Which assumes that forestland and timber growing stock values follow timber prices, and that management expenses are a constant proportion of forest value.

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NOTES:

Figure 1. The source for the U.S. Housing Starts is U.S. Bureau of Census. The Housing Starts data includes Single-family and Multi-family starts. Crows Framing Lumber Composite Index data is RISI.

Figure 2. Quarterly Australian Dwelling Unit Approvals is published by the Australian Bureau of Statistics. The Lumber Index is published by URS Timber Market Survey using Softwood Structural lumber prices (Blended Price - 60percent MGP 10 90x35x4800, 40percent MGP 10 70x35x4800). Log Price Index is calculated using the (APLPI) Radiata Pine Domestic Stumpage prices. The log price is an average of Intermediate and Medium sawlog prices

Figure 3. Quarterly New Zealand softwood log export volume to China and China Import prices are published by the RISI International Timber Service.

Figure 4. Monthly average Exchange Rates are published by the Pacific Exchange Rate Service.

Figure 5. Quarterly Softwood Sawtimber Stumpage Prices for the U.S. Pacific Northwest is reported in Loglines published by RISI. The weighted index is made up of 50percent Domestic Douglas-fir (47percent #2 and 53percent #3 Sawmill sorts) and 50percent Whitewoods (47percent #2 and 53percent #3 Sawmill sorts). U.S. South prices are published by Timber Mart-South (60percent Southern Pine Sawtimber and 40percent Chip-n-Saw). Australian domestic prices are calculated using the KPMG Australian Pine Log Price Index (APLPI) Radiata Pine Domestic Stumpage prices. The log price is an average of Intermediate and Medium sawlog prices converted to USD/m3. New Zealand radiata pine export log prices are a blend of A,K and J sort logs published by New Zealand Ministry of Primary Industries converted to USD.

Figure 6. Quarterly Market Pulp prices are published by Hawkins Wright. U.S. Southern Pine Pulpwood prices are published by Timber Mart-South. Brazil Eucalyptus Pulpwood prices are published by STCP Engenharia de Projetos Ltda.

Figure 7. Annualized Operating Cash Yields are published by National Council of Real Estate Investment Fiduciaries (NCREIF). Yields are calculated using 60percent U.S. South and 40percent U.S. West.

Figure 8. The Hancock Securitized Timberland Index (HSTI) uses a base-weighted aggregate methodology (similar to that used to construct the S&P 500) to calculate a market capitalization-weighted value for five publicly traded timber-intensive forest products companies. Base weights were adjusted for the emergence of new companies or at the beginning of each year. Dividends are not reinvested. The companies included in the HSTI have no investment relationship with Hancock Timber Resource Group.

Figure 9. Public equity values are derived from our Timberland Enterprise Value per Southern Equivalent Acre (TEV/SEA) calculation for five timber-intensive publicly traded companies as compared to southern timberland values per acre calculated from the NCREIF database. TEV is a quarterly estimate based on total enterprise value (total market equity + book value debt) less estimated value of processing facilities, other non-timber assets and non-enterprise working capital. SEA uses regional NCREIF $/acre values to translate a company's timberland holdings in various regions to the area of southern timberland that would have an equivalent market value.