



The Benefits of International Diversification on Currency Risk in a Timberland Investment Portfolio

Introduction

Institutional investment in timberland has grown significantly from virtually nil in the early 1990s to approximately USD 90 billion today.¹ Institutional interest in timberland investment emerged in the United States and was supported by an industry-wide trend of industrial timber companies separating and selling off their forestry assets while retaining their core processing business such as sawmilling and paper manufacturing. This trend was driven by an acknowledgement that the economic activity of growing trees has a different risk profile from industrial processing. US corporates using generally accepted accounting principles had to pay tax on the forest even when they didn't cut it, incentivising them to sell to US tax-free pension funds. In addition, the heavy land component of forestry assets made them suited to preferential tax treatment through structures such as Real Estate Investment Trusts (REITs) as they were able to make their distributions as a return of capital rather than a dividend, again creating tax advantages over corporate ownership.

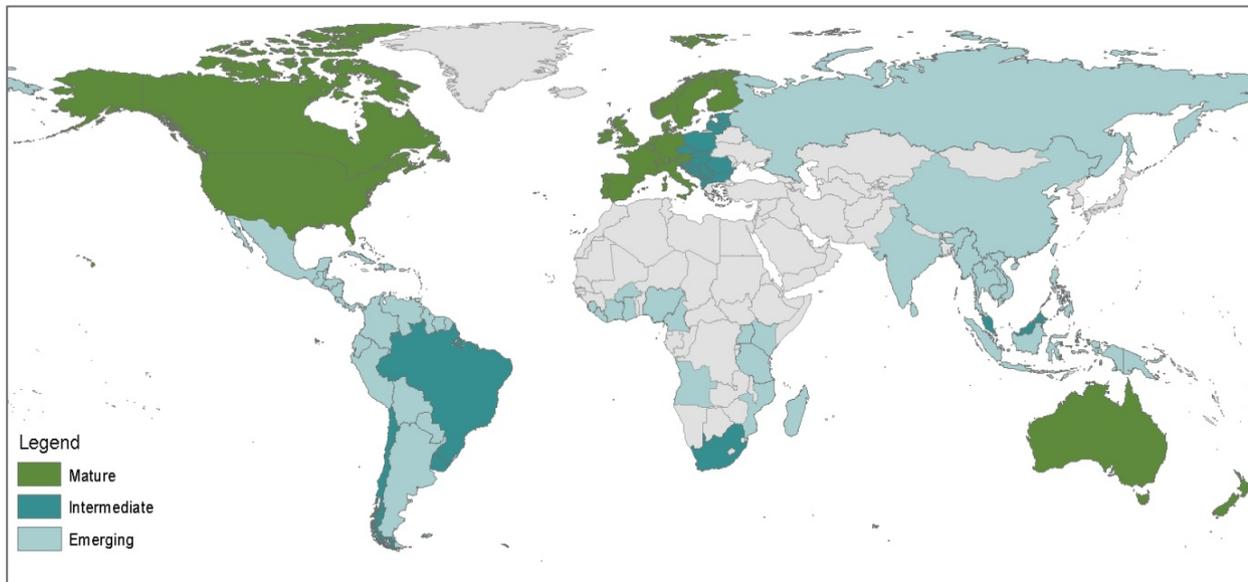
Concurrent to this growing interest in the timberland asset class has been the increasing allocation by institutional investors to what have become known as alternative assets. Broadly this allocation captures sectors such as real assets (e.g. timberland, energy, and agriculture), private equity, real estate, and infrastructure. Alternative asset investments are accessed directly through private markets and are alternative in the sense that they fall outside traditional asset classes like listed equities, fixed income, and cash. Timberland is an attractive asset class because it has been shown to be inflation-linked and has the unique characteristic that revenues are a function of biological growth, which continues over the long term and is uncorrelated with economic conditions or market swings. Harvest (and thus revenues) can be accelerated in periods of strong timber prices or alternatively reduced during periods of weak markets but with capital continuing to accumulate "on the stump" as the tree crop continues to grow. Returns are thus a mix of both cash yield and capital appreciation.

The initial phase of institutional timberland investment described above can now be considered largely completed, with the bulk of large US forestry assets now in institutional ownership. This maturing of the US timberland sector has over recent years driven a new wave of investor interest in non-US markets, especially Latin America, Australia, New Zealand, and Asia. As competition in the US timberland market has contributed to a decline in returns, investors are looking elsewhere for more attractive risk-adjusted returns. Moreover, international diversification provides investors with exposure to a variety of end-markets with various

¹ New Forests (2013). *Timberland Investment Outlook, 2013-17*. (Note: Includes unlisted holdings of timberland managers, timber REITs, and direct ownership by institutional investors.)

macroeconomic drivers, particularly growth in emerging markets and the Asia-Pacific region. Figure 1 shows the various timberland investment regions and their stage of development and level of investment risk. For example, there is very little institutional investment in Europe, where forests are owned by hundreds and thousands of small private owners.

Figure 1 – Mature, Intermediate, and Emerging Timberland Investment Regions



The internationalisation of the timberland asset class has driven increasing focus on the extent to which currency risk influences returns. This issue has been of particular concern for US dollar denominated institutional investors who are now looking to invest offshore in less mature timberland markets and who ask the question of whether the benefits of international diversification outweigh the currency risk associated with their investments. In this paper we attempt to quantify whether an internationally diversified timberland portfolio can provide lower volatility than a non-diversified one. We do this through the analysis of an assortment of international timber prices, with timber pricing being one of the key drivers of timberland returns. We provide analysis of timber price volatility across a range of international wood products markets for investors denominated in Euro, Sterling, US dollars, and Australian dollars and show that, based on data over the past 20 years, a sensibly diversified international portfolio may reduce price volatility. This in turn may reduce the volatility of returns at a portfolio level, while at the same time allowing investors to gain exposure to the higher returns that are available in emerging markets.

Currency Effects on Timber – An Overview

Currency fluctuations may affect timberland investment in a number of ways, even for assets that sell timber products into domestic markets. For example, exchange rate movements may have a short-term effect on fuel costs, especially in countries highly dependent on fuel imports or for export-based markets exposed to shipping costs. Over a longer time frame, a declining currency will put upwards pressure on inflation that may feed into wage rates for forest industry workers but may also put upward price pressure on domestic timber markets. Inflation too will affect interest rates, which impact investments to the extent assets are geared or exposed to financing for capital equipment. Even for assets with 100% domestic market exposure, the threat or presence of import substitution, which will increase as currencies appreciate, will also impact timber prices and overall sales revenue.

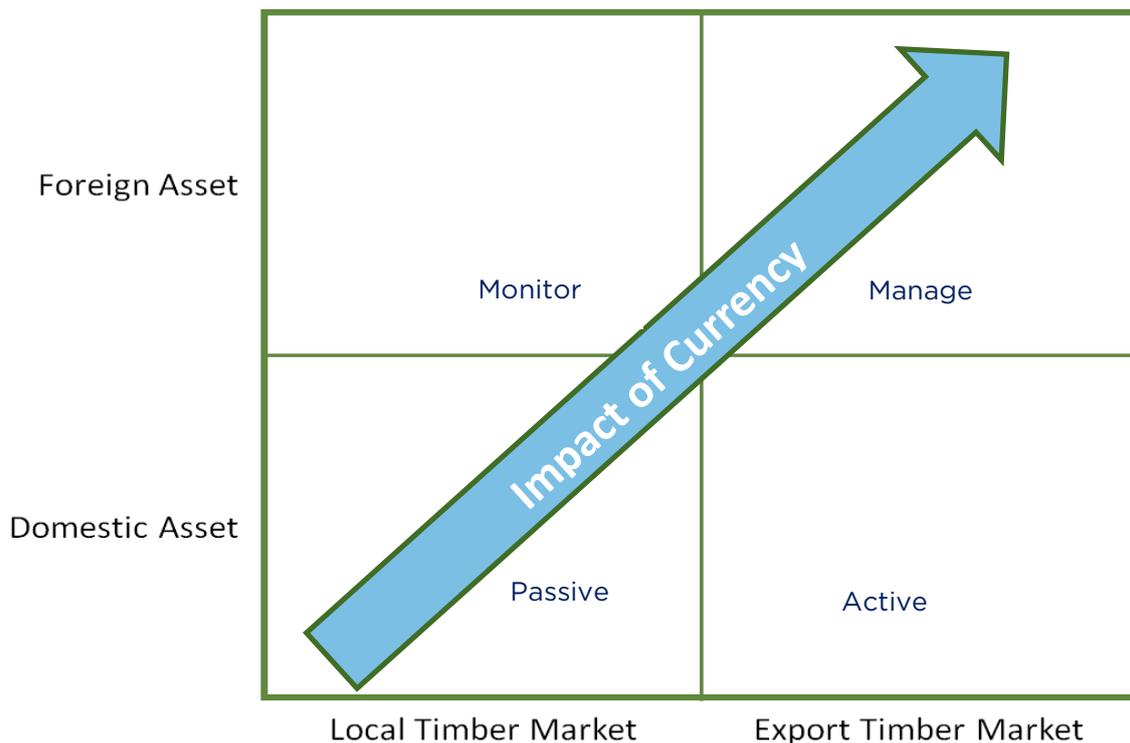
The two key considerations in assessing the potential impact of currency risk in a timberland portfolio are asset location (foreign or domestic, relative to the investor) and the timber market exposure (local or export, relative to the asset). As illustrated in Figure 2, the impact of currency

is expected to trend higher for foreign assets with larger export market exposure for their timber production.

The relevance of currency risk for asset location (vertical axis) is with regard to the deployment of capital at the time of acquisition, ongoing cash generation during the life of the investment, and the repatriation of capital at exit. Investors should therefore consider the type of investment in conjunction with currency risk, with greenfield asset returns having a higher dependence on exit value and existing plantations generating an ongoing yield delivering returns across a longer currency timeline.

The balance of local or export timber market exposure (horizontal axis) introduces a further consideration as to whether or not currency factors increase or reduce risk in a portfolio. Like most commodities, internationally traded timber markets are typically denominated in US dollars, so for many currencies, timber prices tend to move against their home currency and so provide a natural hedge. For example, a US-based investor may make an investment in Australian dollars into an Australian eucalyptus plantation exporting woodchips to Asia. The international woodchip market is denominated in US dollars. When the Australian dollar rises relative to the US dollar, as in recent years, the asset may increase its value for the US-dollar investor. However, the export market for Australian woodchips would be depressed because of the high Australian dollar. In reverse, however, when the Australian dollar is weak compared to the US dollar, Australian woodchip will become more competitive and sales will increase, but there may be some currency impact for the US investor converting the value of the Australian dollar based asset back into US dollars. In this way, there is a natural hedge against these currency movements.

Figure 2 –Considering the Currency Risk Associated with Timberland Investments



Assessing Currency Risk in Portfolios

Method

There is insufficient information about non-US timberland returns to quantify the volatility impact of foreign exchange movements on investor returns. Consequently, we must consider other aspects of timberland investment that can be used as a proxy for currency risk and could provide evidence to support international diversification in a timberland portfolio. Global timber market prices are an appropriate proxy due to the impact of timber market prices on realised cash flows as well as flow-on impacts for valuations and unrealised returns. New Forests has modelled theoretical, internationally diversified timberland portfolios and evaluated the weighted-average prices of a variety of timber products. The timber products included were selected for their representation of the range of products harvested across a diversified portfolio with investments in the United States, Australia, New Zealand, Latin America, and Asia. This aligns with New Forests' recommendations for a diversified timberland portfolio that includes established, mature timberland markets that provide low-risk opportunities as well as emerging market opportunities that typically offer higher risk-return investment opportunities.² The approach taken is described in further detail in Figure 3.

Figure 3 – Methodological Approach and Inputs for Creating Portfolio Price Series



The above elements are combined in order to generate a portfolio price series for each of the investor currencies. Each portfolio price series shows the weighted-average price per tonne of products within the theoretical timberland portfolio. After generating the portfolio prices series, we analyse the volatility for each of the four portfolios based on their standard deviations.

Global Portfolio Allocations

Typically, investors seeking timberland investments outside the US are expected to have or be developing an internationally diversified portfolio. In this paper, we therefore take a portfolio-level perspective for a variety of investors, based on the home currency of the investor. The first step is to consider what an internationally-diversified portfolio would look like in terms of regional allocations. We address investors with home currencies of USD, Euro, GBP, and AUD as we find these to be the predominant investment currencies of institutional timberland investors.

Given that investors look to timber for low-risk and consistent returns, they traditionally have sought to maximise their allocation to timberland assets in their own currency to the extent possible. In particular US investors have historically held a majority of their portfolio in US dollar denominated assets, as this matches their liability currency and the availability of investible US dollar denominated assets was large. On the other hand, given the relatively more limited mature market opportunities outside of the US, nearly all non-USD investors will need to accept international diversification and, by extension, a higher degree of currency risk. Given the effect of currency risk, it may be therefore comparatively more attractive for non-US investors to seek more diversified portfolios than it is for US-domiciled investors.

While each investor's needs are different, we have modelled the following portfolio allocation framework for diversification across major timberland investment regions. The indicative portfolio allocations reflect New Forests' approach to diversified portfolios taking into account

² New Forests, 2013. "Timberland Investment Outlook, 2013-2017." Available online at: <http://newforests.com.au/news/pdf/articles/NewForestsTimberlandInvestmentOutlook2013.pdf>.

major timberland investment regions and assuming investors will tolerate higher than average allocations to investments within their own region and currency and that they will exhibit a preference for investments in the largest timberland market, the United States. European investments are not included due to the limited opportunity for institutional investments in planted forests in the region.

Table 1 - Indicative Global Portfolio Allocations by Investor Currency

Investor Currency	United States	Australia-New Zealand	Latin America	Asia
USD	60%	15%	15%	10%
Euro	40%	30%	15%	15%
GBP	50%	30%	10%	10%
AUD	35%	40%	10%	15%

While the above portfolio allocations are indicative, we use them as an example throughout this paper when we refer to the global portfolio allocation for each of the investor currencies of USD, Euro, GBP, and AUD.

Regional Timber Product Mix

Through investing in an internationally diversified portfolio, investors gain exposure to a variety of timber products and markets. We have simplified this analysis by assuming a product mix within each investment region based on its predominant timber markets. For example, even in New Zealand where timberland assets are 97% radiata pine, for each forest resource there would be a mix of log grades and woodchip. While this mix depends on each asset, it is reasonable to assume overall product mix represented by the dominant products, e.g. export A grade logs and grade 1 domestic sawlogs in the case of New Zealand. Table 2 shows the product mix assumed for each region, which is based on market trends in plantation timber products.³ This product mix is then utilised in calculating the weighted average price for each product across all regions.

Table 2 – Product Mix Allocation by Region

US				Australia			New Zealand		South America	Asia	
Pacific North West Domestic Douglas Fir	California Fir and Pine Domestic	Pacific North West Export Douglas Fir	South East Pine Domestic	Hardwood Woodchips Export	Softwood Woodchips Export	Softwood Sawlogs Domestic	Softwood Sawlog Export	Softwood Sawlog Domestic	Hardwood Woodchips Export	Rubber Export	Hardwood Meranti Export
30%	10%	10%	50%	50%	15%	35%	50%	50%	100%	5%	95%

Standardising Price Data

Timber price data comes in a variety of formats, including point and terms of sale, but for comparison purposes it is important to standardise all the data to a comparable point of sale and to standardise the units of measurement. The data reviewed here were originally sourced from various points of sale, including stumpage, At Wharf Gate (AWG), Free on Board (FOB), and Cost in Freight (CIF)⁴ and were in a variety of units of measurement, including \$/m³, \$/JASm³, \$/CD, \$/MBF, \$/BDMT⁵, and cents/pound at various currencies.

In the analysis below, we have converted all price data into series based on USD/tonne values. Note that we also include rubber within the consideration of products. Although rubber is not a timber product, but rather is a non-timber forest product, New Forests believes rubber can play

⁴ Stumpage – point of sale is in the forest, AWG – point of sale is at wharf gate, FOB – point of sale is loaded onto vessel at outbound port, CIF – point of sale is delivered to destination port

⁵ M³ – cubic metre, JAS – Japanese Agricultural Standard, CD – Cord, MBF – million board feet, BDMT – bone dry metric tonne

an important role in delivering cash yield from managed timber plantations that will ultimately produce highly sought-after rubberwood sawlogs.

Figure 4 – Points of Sale Vary Across Timber Products and Supply Chains



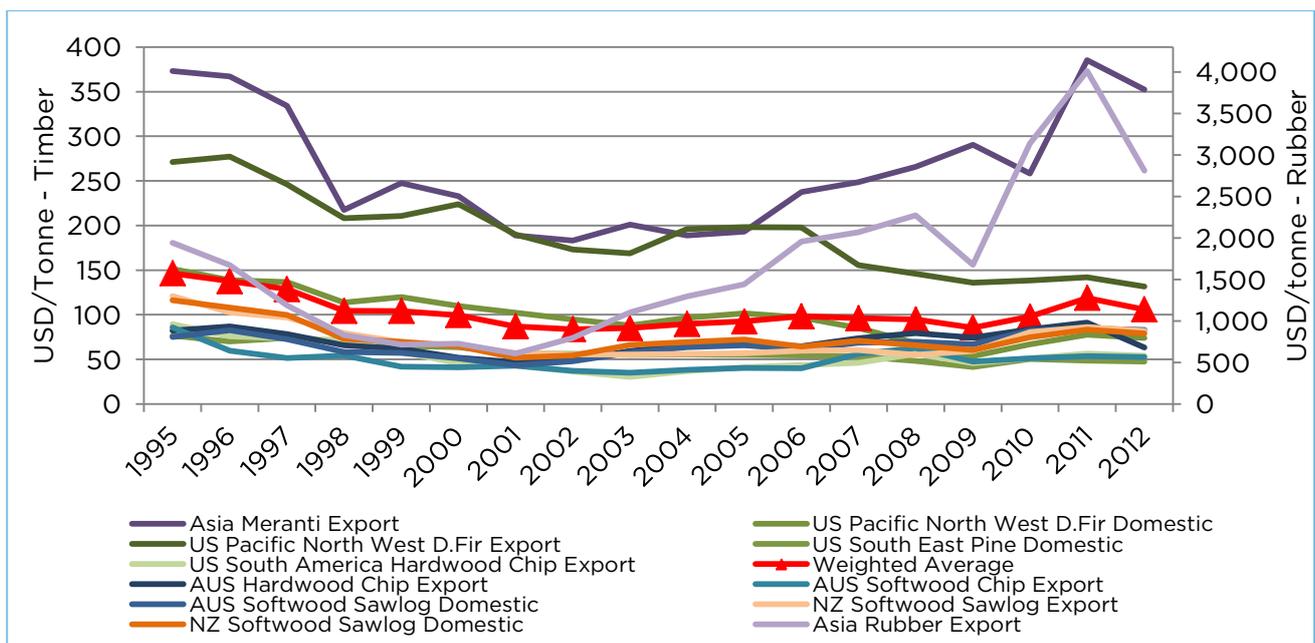
Photographs above illustrate differing points in the timber delivery supply chain. At left, radiata pine logs are unloaded at mill gate in South Australia. At right, a loaded ship leaves the Solomon Islands with plantation logs bound for Japan. Standardising timber price data requires adjusting for the point of sale and costs associated, such as handling, freight, and insurance, as well as accounting for the units of measurement, which differ across products and markets.

Weighted Average Prices

In order to derive a weighted-average price for each portfolio, we have assigned a weighting to each region via the global portfolio allocation (Table 1) and to the products within each region using the regional product mix (Table 2). As the price data are standardised in USD/tonne, the portfolio price series reflects averages based on the volume of timber products rather than based on dollars invested into a region.

Figure 5 shows the weighted-average USD portfolio price (weighted average line) as compared to the individual product prices as standardised to USD (expressed in real 2013 USD). The rubber price is shown on the secondary-axis as it is much more valuable on a \$/tonne basis than the other timber products.

Figure 5 – Individual Timber Product Prices in USD compared to USD Weighted Average



The weighted-average price series was calculated for each portfolio based on the example portfolio allocation (as determined by investor currency, Table 1) in order to create the four portfolio price series as shown in Figure 6. The AUD price series has lowered and approached convergence with the other three currencies over the last five years as the Australian dollar has strengthened (before its recent moderation in mid 2013).

Figure 6 – Comparison of Portfolio Price Series

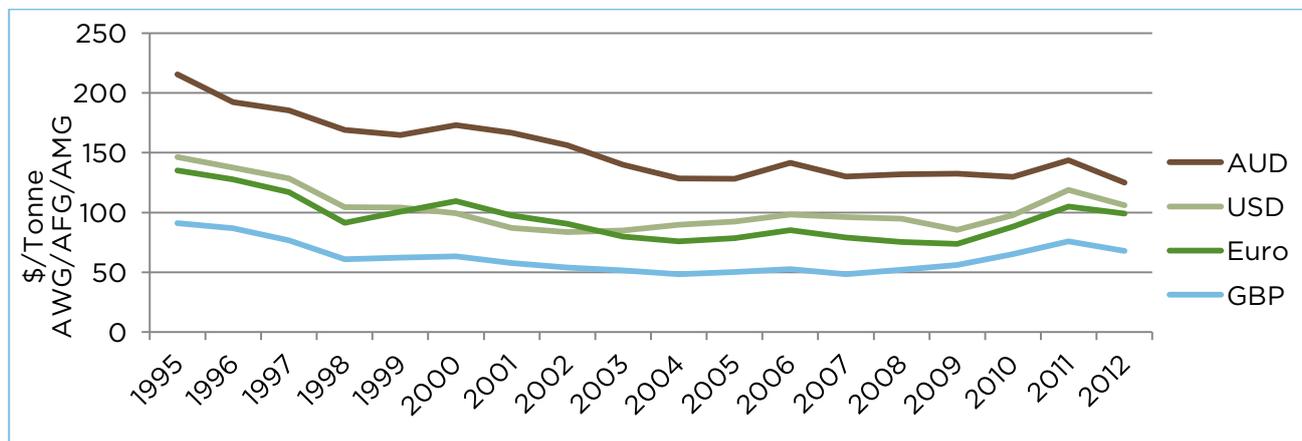


Figure 6 shows the combined portfolio mix, weighted by the suggested portfolio allocation, in each of the example portfolios. The relative flatness of the portfolio-level price series, as compared with individual product price series in Figure 5 demonstrates the lower volatility of the combined portfolios.

Analysis of Volatility

While timberland is often cited as a low volatility asset class, investors may be concerned about how changes in timber market prices or exchange rates will affect their returns. One measure of this is the volatility of timber prices. We quantify this volatility by calculating the standard deviation and then expressing that standard deviation as a percentage of the price or price series being analysed. This makes it easier to compare the volatility among the products. A high price volatility percentage indicates a higher spread of prices compared to the average.

Timber Product Volatility

In reality few investors would be exposed to only one timber product through their investments; however, calculating the individual timber product volatility enables us to consider each component of the portfolio as an individual element contributing to the overall volatility. Table 3 shows the timber product volatility for key timber markets translated back into each investor currency. This is useful in the context of considering cash yield from a particular asset and the volatility of those cash flows. When viewed in USD terms, the individual timber products have volatility percentages ranging from 16.8% (US Southeastern pine) to 29.6% (South American hardwood woodchip) and rubber has a volatility of 55.4%. By contrast the lowest volatility market exposure for Australian investors is Australian domestic sawlogs at 7.9%, with US Southeastern pine a comparatively much higher 28.6%. It is not the intention of this paper to describe the wide set of factors that may contribute to timber product price volatility; however, it is worth noting that market characteristics vary widely and how timber is traded is generally expected to affect the volatility. For example, the low 7.9% volatility for Australian softwood sawlogs reflects the nature of long-term timber sales contracts in the region. By contrast, the US South has a more liquid softwood sawlog market with a large timber processing industry and tends to utilise short-term contracts or spot sales.

Table 3 – Price Volatility of Various Market Exposures in Each Major Currency

Market Exposure	Price Volatility Percentage %			
	USD	Euro	GBP	AUD
US - Pacific Northwest Domestic Douglas Fir	26.9	34.1	29.7	35.8
US - California fir and pine	26.0	35.1	29.7	36.7
US - Pacific Northwest Export Douglas fir	23.8	31.4	26.7	32.9
US - Southeast pine	16.8	25.8	20.2	28.6
Asia - Rubber	55.4	46.3	57.1	37.2
Asia - Meranti	26.2	23.8	29.1	19.6
Australia - Hardwood Woodchips	18.7	12.6	19.7	12.2
Australia - Softwood Woodchips	24.6	23.7	26.1	24.5
Australia - Softwood Sawlogs (Domestic)	18.9	12.8	20.4	7.9
New Zealand - Softwood Sawlog Export	26.8	28.4	30.3	27.2
New Zealand - Softwood Sawlog Domestic	23.2	24.0	25.6	22.7
South America - Hardwood Woodchips	29.6	31.2	32.0	32.0

The volatility of price series depends on investor currency, with the most volatile price series for the US and British investor being Rubber and South American hardwood woodchip export, for the European and Australian investor it is Rubber and California Fir and Pine.

Benefits of International Diversification

Table 4 illustrates the reduction in timber price risk that investors can achieve by diversifying away from a traditional US-only allocation. The first line shows the price volatility exposure of the representative US-only asset portfolio outlined in Table 2 (i.e. 10% each in California and Pacific Northwest export, 30% Pacific Northwest domestic, and 50% southeast) translated back into the investor's home currency. As expected, non-US investors experience higher volatility due to currency risk. The second line looks at the more tailored portfolio allocations for each investor group outlined in Table 1, applying the various regional exposures suggested in Table 2. As can be seen, each investor group of the major currencies sees a significant reduction in the exposure to timber price volatility through geographic diversification. This is even true for US investors who benefit from the non-correlation between offshore and US timber markets as well as limited additional currency risk given most global timber trade is in US dollars.

Table 4 – Price Volatility as a Percentage of Price Series Average

		Investor Currency and Price Volatility %			
		USD	Euro	GBP	AUD
Portfolio Type	US only (Table 2)	22.3%	30.5%	25.4%	32.5%
	Indicative Allocations (Table 1) to Regional Exposure (Table 2)	17.8%	19.2%	20.8%	17.2%

Conclusions

Historically, the majority of institutional investors have focused on US timberland, but the investment industry has begun to explore opportunities in timberland areas outside of the US. By internationally diversifying a timberland investment portfolio, investors gain exposure to assets with typically higher returns. In general international timberland is benchmarked against US timberland with Australian assets trading at prices that deliver a 100-400 basis point return premium over US softwoods, New Zealand a 200-400 basis point premium, and Asia a 500-1400 basis point premium. The analysis presented shows that by using a tailored international allocation, these higher returns can be accessed in a manner that not only compensates for increased timber price and currency risk but that actually reduces these risks at the portfolio level. This is true even for US investors who have the advantage of international timber trade being in their home currency.

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