FX Risk in Timberland Investment: Comparing Two Measures of Return

Seeking greater diversification and higher absolute returns, USD-denominated timberland investors are increasingly acquiring assets outside the US. Such investors rightly want to understand the risks associated with the translation of local-currency cash flows back into USD (“FX risk”). The quantification of FX risk is, in part, determined by the method investors use to translate these values and calculate returns. Using a model of a Latin American timberland investment, we find that, for investors in long-term private timberland investment vehicles, the common fair market value approach to annual return calculations greatly overstates the true FX risk of timberland investment.

BACKGROUND

Consider the case of a USD-denominated timberland investor. For such an investor, the optimal timberland investment portfolio—whether risk-minimizing, return-maximizing, or risk-adjusted return maximizing—contains a substantial allocation to investments outside the US (Busby et al., 2018). This result is obtained despite the volatility of historical changes in foreign currency exchange rates (“FX”). Figure 1 shows the historical changes in three Latin American currencies important to most timberland investors—the Uruguayan peso, Chilean peso and the Brazilian real. The absolute fluctuations over the most recent fifteen-year period have been large, most notably with the BRL depreciating by about 50% in 2015.
While specific investment characteristics may offset FX risk (and sophisticated institutional investors may further offset FX risk via market mechanisms), here we examine a case where the investment is fully local-currency denominated. No matter the degree of FX exposure, however, the quantification of FX risk depends on the method by which returns are calculated.

The economic return from an investment is conventionally measured by the internal rate of return (“IRR”). With this measure, each year’s cash flow is translated back to USD prior to calculating the return. But the net asset value (“NAV”) – as determined by an appraised value or a discounted cashflow model – is translated to USD only at the end of the holding period.

A primary alternative to IRR is the calculation of annual returns based on the asset’s fair market value (“FMV”). In this approach, both the year’s cash flows and the end-of-year NAV are translated into USD at year-end FX, where NAV is the present value of cashflows from t+1 onward. Using this standard, even if there is no intention or possibility of selling the asset, the NAV is “marked to market” at current FX and translated back to USD. For a typically long-duration, illiquid asset like timberland, this latter FX translation introduces an important non-cash risk factor in how returns are reported. The additional volatility introduced by this measure can have real financial impacts, particularly for investors with liquidity constraints (e.g., by altering measures of risk-based capital or the size of a pension surplus or deficit that relieves/requires plan sponsors from annual contributions).

**APPREACH**

To explore the additional volatility introduced by annual FMV return calculations, we model a prototypical non-US timberland investment: a eucalyptus pulpwood plantation in Latin America. We assume all costs and revenues are denominated in the local currency. Our base case is a 10-year holding period (Busby and Binkley [forthcoming 2018] explores a range of holding periods).

To model the impact of FX risk on timberland investment returns, we conduct a Monte Carlo stochastic simulation where volatility in FX drives volatility in cash flows and returns. We assume that FX evolves following a normal arithmetic random-walk (without drift), where the standard deviation of the stochastic process governing FX volatility is set at a level based on average historical changes in FX in the three Latin American countries noted above.

Annual FMV returns are simply equal to the sum of income and capital appreciation return—or the annual cash flow (“CF”) plus the year-on-year change in NAV, each expressed as a percentage of the prior year’s NAV. In each case, the local currency amounts are converted to USD using the FX in the year they occur. FMV return in year $t$ is calculated as:

$$FMV_t = \frac{CF_t}{NAV_{t-1}} + \frac{(NAV_t - NAV_{t-1})}{NAV_{t-1}}$$

In addition to annual FMV returns, we report long-term, holding-period returns calculated in two ways. First, as the geometric mean of annual FMV returns over the assumed holding period. Second, as the IRR of the stream of annual cash flows plus the NAV at the end of the assumed holding period.

**RESULTS**

We compare two measures of long-term return to annual FMV return. Figure 2 shows the distributions of IRR and FMV returns for the assumed 10-year holding period and annual FMV return. Summary statistics describing these return distributions are shown in Table 1.
to the IRR is, in effect, discounted by the length of the holding period. The discounting process attenuates the contribution of the volatility in sales realization to overall return volatility, regardless of the underlying model of FX development.

**WHAT DOES THIS MEAN FOR INVESTORS?**

When measuring performance of non-USD timberland investments—long-term, illiquid assets—annual FMV accounting returns overstate the true volatility of economic returns as measured by long-term IRR or FMV. This overstatement of volatility leads to a very large (more than 4x) understatement of risk-adjusted returns. Two important implications for investors contemplating non-US timberland investments follow:

1. A narrow focus on annual accounting returns, as measured by FMV, alone may lead to under-investment in non-US timberland, reducing risk-adjusted returns. Further, this focus may lead to over valuing US investments and undervaluing non-US opportunities.

2. Focusing on long-term economic returns, as measured by IRR or FMV, may lead to a comparative advantage in non-US timberland investment opportunities, lacking competition from FMV-sensitive investors.

There are some parallels between the consideration of FX in the two measures of return and what took place in the early stages of timberland investment in the US. In the 1970s and 1980s, US GAAP-sensitive forest products companies sold timberland to US institutions focused on total returns as measured by IRR. US GAAP standards of the time consistently understated timberland returns by (i) taking into account tax-favored but economically excessive “depletion” from harvesting and (ii) failing to record true economic gains as trees grew. The subsequent arbitrage gave rise to the whole timberland asset class and some outstanding returns early on.
US HOUSING

- Second quarter US housing data were mixed. Positive data in May, coming in at 1.33 million starts, was followed by a material drop in June, to 1.16 million.

FIGURE 3. U.S. HOUSING STARTS

- Total housing starts declined 4.8% during the quarter, largely driven by a 16.8% decline in multi-family construction, which is a more volatile sector and makes up about 27% of the market. Single-family units, which utilize up to three times more wood, represent about 73% of total housing starts and experienced a slight gain of 0.8%.

- Continued well-known constraints related to affordability, labor construction, and buildable lots (GWR Fieldnotes, Q1 2018) remain headwinds that largely explain the recent mixed monthly figures. For example, the number of unfilled jobs in the construction sector hit the highest level in the cycle with 263,000 vacancies (ERA, July/August 2018).

- On an annual basis, however, starts have continuously increased since 2008, albeit slowly, and positive fundamentals persist. Year-to-date, annualized housing starts total 1.29 million, representing a 7.1% increase compared to the year-to-date figure of 1.20 million from the same period in 2017.

- US economic growth, improving labor markets, millennial-led demographics, years of underbuilding, and an aging housing stock remain supportive of housing demand and signal new construction in the horizon. On the other hand, timing, pace, and potential changes in millennials’ preference for housing over the long term remain questions lingering in the air.

- Second quarter residential improvement (repair and remodel) expenditures remained strong, reaching a seasonally adjusted annual rate (“SAAR”) of $158 billion, a 1.4% increase compared to Q1 2018 and a 3.8% increase on a year-to-date basis.

LOG MARKETS

- Log prices in the Pacific Northwest (“PNW”) remain historically high but experienced a slight softening on the export side due to uncertainty related to potential tariffs from the well-covered trade friction between the US and China.

- While export demand continues, the tariff uncertainty led to slight decreases in log prices. Douglas-fir prices and hemlock to China decreased 3.0% and 3.8% during Q2 2018. On an annual basis, however, prices remain 13.2% and 9.3% higher compared to 2017 price levels. To mitigate some of the tariff related market impacts, domestic producers may shift volumes between export and domestic markets, depending on pricing and location.
During Q2 2018, domestic softwood lumber production in the PNW increased 4.6%, representing approximately 2.4 billion board feet (“BBF”) and 24% of US production (FEA). With mills increasing production, domestic Douglas-fir and whitewoods (hemlock and true firs) sawlog prices increased 1.4% and 1.2% quarter-over-quarter, holding impressive annual gains of 24.9% and 27.8%, respectively (RISI).

US South timber prices retracted some of the gains experienced early in the year and remain fairly muted. Southern pine sawlog and pulpllog prices decreased 0.5% and 0.4% quarter-over-quarter with modest gains of 1.3% and 0.7% year-over-year. To reiterate, low timber prices in the region, combined with healthy growing demand for wood products in the US, continue to attract manufacturing investments in some regions, which has the potential to differentiate prices across the US South.

**LUMBER MARKETS**

- Consistent with continued manufacturing investment and strong US demand for wood products, both US lumber consumption and production continued to gain momentum through the second quarter.

- Total US softwood lumber production during the quarter totalled 9.9 BBF, an increase of 15% compared to the corrected figure of 8.6 BBF from Q1 2018 and a 14% increase on an annual basis. Year-to-date production of 18.4 BBF is on pace to be the highest annual figure since the housing boom in 2006, when lumber output reached 38.7 BBF (Figure 5).

**FIGURE 6. SOFTWOOD LUMBER PRICES**

- The South is experiencing the largest gains in softwood lumber production in the US with impressive gains of 19.5% and 15.0% on a quarterly and annual basis, respectively. During Q2 2018, production in the US South represented almost 55% of total US production. Growth is expected to continue in this region driven by investments in processing facilities and availability of standing timber.

- US lumber consumption increased 18% quarter-over-quarter and 4.9% year-over-year. With domestic production growing along with increased consumption, the market share of Canadian lumber in the US is now hovering around 28% for the year, significantly lower compared to the mid 30% range experienced in 2016.

- Despite some volatility and a monthly decline in Western spruce-pine-fir (“SPF”) lumber composite prices towards the end of the quarter, lumber prices remain at historic highs. Southern Pine and Western SPF lumber composites increased 16% and 13% during the quarter, showing impressive annual gains of 40% and 49%, respectively (Figure 6).

**FIGURE 5. SOFTWOOD LUMBER PRODUCTION**

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**EUROPE**

**EUROPEAN BIOMASS**

**FIGURE 7. EUROPEAN PELLET PRICES, JAN. 2008 – JULY 2018**

- The summer months have allowed suppliers in European pellet markets an opportunity to rebuild depleted inventories. Prices are up year-over-year in major industrial markets and all regional heating markets except Switzerland.

- As temperatures begin to drop in Q3 and Q4, residential heating demand is expected to grow. In industrial markets, Hawkins Wright (July 2018) reports some discussion of swaps of Q4 2018 for Q1 2019 deliveries, possibly indicating European utilities are not expecting markets to be as tight as previously expected.

- In Q2 2018, Poland approved an amendment to the country’s renewable energy law removing obstacles to green energy investment. In late-June, Poland’s upper house of parliament approved the removal of clean power disincentives—taxes and regulatory restrictions—and the initiation of auctions under a new subsidy system in which renewable producers would be assured stable pricing. The amended policy is aimed at getting Poland back on track to meet its EU target of 15% of energy from renewables as a share of total energy consumption by 2020. As Europe’s biggest exporter and second-biggest consumer of coal, Poland’s challenge is to balance a powerful domestic coal industry with EU renewable energy policy targets.

**FIGURE 8. EUROPEAN ENERGY PRICES, JAN. 2014 – JULY 2018**

- In European energy markets, prices for coal, oil and natural gas climbed through the summer months. Above-average temperatures across Europe increased demand for electricity and pushed power prices higher. Global crude oil prices continued to rise and, for the first time since 2014, ICE’s Brent crude index reached $80/barrel. The recent run-up in oil prices has been driven in part by US trade sanctions, impacting supply from Iran.

**LATIN AMERICA**

**PULP MARKETS**

- Announced in Q1 2018, Suzano’s acquisition of Fibria for BRL 36 billion (USD 11 billion) in cash and shares is expected to close within the next 6-12 months. Hawkins Wright (August 2018) reports that the proposed new entity will account for approximately 14% of the bleached chemical pulp market (28% of the BHKP sector). The consolidation will likely result in the postponement of any near-term brownfield or greenfield investment plans that the two companies may have had. Already underway, however, is Fibria’s ramp up in production at the Tres Lagoas Horizonte II line. Fibria’s expansion at Tres Lagoas represents the major source of near-term growth in global hardwood pulp supply.

- In 2018 year-to-date, Brazilian pulp exports are up compared to the same period a year earlier and on track to reach record levels in terms of both volume and value. For the first seven months of the year (January to July), total pulp export value (USD) is up 41%.
REGIONAL MARKETS

These gains reflect continued strong global demand and a highly competitive Brazilian supply. The recent depreciation of the BRL will further support the competitive position of Brazilian producers in international pulp markets.

**FIGURE 9. BRAZILIAN PULP EXPORTS, 2006-2018YTD**

- Planning for construction of a new UPM pulp mill in Uruguay is ongoing. UPM has a signed Investment Agreement with the government but material progress will likely be delayed by the October 2019 elections. Ongoing work includes, for example, infrastructure, pre-engineering, and permitting. UPM’s current pulp capacity is 3.7 million tonnes/year across mills in Finland and Uruguay. In Uruguay, the existing mill (Fray Bentos) contributes 1.3 mm tons/year to total capacity and the proposed mill would add 2-2.1 million tons/year of capacity.

TROPICAL HARDWOODS

- Teak imports to India finished 2017 at a record high and are on track to reach a new high in 2018, according to Indian trade statistics. Year-to-date (January to May), the value of teak imports to India is up over 50% compared to the same period in 2017, with imports from South America and Africa up dramatically year-to-date. Consistent with trade statistics, ITTO (August 2018) reports that demand for imported plantation teak logs has risen on the back of firmer domestic demand.
- The growing importance of plantation grown teak reflects the increasing scarcity of natural grown teak, particularly from Myanmar. Recent observations from Myanmar reflect this trend. ITTO (August 2018) reports that not only are available volumes and the log quality of natural teak declining, but pressure from European Union countries for legality verification is getting tougher and tougher.

**FIGURE 10. VALUE OF TEAK IMPORTS TO INDIA**

- In the US, the California (CA) carbon market remains the major driver of demand for forest-based carbon offset credits. However, price risk in carbon markets is closely related to policy risk and recent changes in North America have had a mixed impact on markets.
- Oregon’s proposed cap-and-trade program is making its way through the state legislature and would create a market for pollution credits, including forest-based offsets. Oregon’s program would be designed to link up with existing markets in California and Canada—the Western Climate Initiative (WCI) carbon market—increasing the total size of the market and potentially bolstering demand for forest-based offsets.
- In contrast, Ontario announced its intention to withdraw from the WCI in June, after formally joining in the program less than a year earlier. To date, Ontario’s announced withdrawal from the WCI has not has a material impact on pricing in the CA carbon market.
- Well-developed regulatory carbon markets in Europe and the U.S. provide information on pricing that can...
be incorporated into traditional financial analysis of investment opportunities. Figure 11 describes carbon price under the EU’s Emissions Trading Scheme. Prices surged in 2018 following the European Parliament’s approval of post-2020 reforms to the EU ETS scheme targeting the oversupply of allowances. Additionally, Hawkins Wright (July 2018) observes that the summer heatwave helped push carbon prices higher, as utilities have had to make additional purchases due to increased power demand. European carbon prices have stayed strong through August, peaking above €18/tCO2.

**FIGURE 11. EU EMISSION TRADING SCHEME CARBON PRICE, 2014 – 2018YTD**

**FOREST SCIENCE**

**EUCALYPTUS TREE IMPROVEMENT IN BRAZIL**

- A collaborative eucalyptus tree improvement program in Brazil seeks to identify new clones that: (1) grow better than the current plant material and (2) increase genetic diversity to ensure future sustainability, reducing risks of plantation failure due to biotic or abiotic factors.

- Two years of trial data show that the top five genotypes produced 28% to 39% more volume than the control clone. Continued testing over the next several years will provide additional growth data and information on wood quality of trial material, to ensure attributes favorable to the industrial pulping process are maintained.

**PRE-COMMERCIAL THINNING IN THE PNW**

- Ongoing research in PNW timberlands seeks to identify the optimal age for pre-commercial thinning (“PCT”) treatment. Researchers are using a twin plot approach, which pairs an experiment plot with a control plot (both with similar levels of pre-treatment wood biomass), to study PCT treatments across a range of ages. Experimental replication within the population of forest stands across the landscape will provide an estimate of the variability of the results.

- Results from the study will allow researchers to identify the age of PCT treatment that maximizes both stand volume growth and net economic return from management.
COUNTRY UPDATES

BRAZIL

• The truck drivers’ strike in late-May in Brazil (a protest against the removal of diesel subsidies) disrupted national economic activity and pushed up inflation. Recent economic data confirmed that the truck drivers’ strike had a real impact on Brazil’s economy. Capital Economics (July 2018) reports that according to data published in July, industrial production fell by 10.9% month-over-month (and 6.6% year-over-year) and services output dropped by 3.8% month-over-month (3.8% year-over-year).

• Brazilian presidential elections are scheduled for October 2018. With populists leading the polls, the upcoming election has increased political and economic uncertainty, putting pressure on the Brazilian real. The April 2018 ruling by Brazil’s Supreme Court to imprison left-wing populist Luiz Inácio Lula da Silva (Lula), effectively ends his bid for the presidency. However, Lula is leading in pre-election opinion polls, trailed by conservative populist Jair Bolsonaro and business-friendly, fiscal reform candidate Geraldo Alckmin.

URUGUAY

• Uruguay’s most recent economic data was largely positive for 2018. GDP growth moderated slightly early this year, from 2.9% year-over-year in Q4 2017 to 2.2% year-over-year in Q1 2018. Looking ahead, economic growth is expected to hold steady at about 2.5%. Headline inflation peaked in July at 8.4% and is expected to increase somewhat before coming back down into the 3-7% target range.

• Similar to the situation in Brazil, near-term growth may benefit from an increase in agricultural exports as Uruguay seeks to gain market share from the US in EU and Asian markets. The export sector has been further strengthened by the recent depreciation in the Uruguayan peso.

COLOMBIA

• Economic growth in Colombia is expected to strengthen in 2018. This outlook continues to be supported by: (1) the recovery in oil prices, boosting investment and economic output; (2) the reduced pace of public austerity measures; and (3) lower inflation and interest rates, increasing consumer spending and improving credit conditions. Colombia’s headline inflation dropped from 3.2% year-over-year in June to 3.1% year-over-year in July and Capital Economics (August 2018) expects GDP in Colombia to grow by 2.8% in 2018, up from 1.8% in 2017.

• In June, the center-right candidate, Ivan Duque, won the presidential election. President Duque campaigned under the promise to cut taxes and stimulate investment in the economy. Specifically, Duque’s three major policy proposals are: a corporate tax cut from 34% to 25%, six VAT-free days a year, and spending cuts equal to 1% of GDP. Jointly, Capital Economics estimates his plans amount to a fiscal stimulus of 0.5% of GDP.

POLAND

• Poland’s economy continues to expand at a rapid pace, growing by an impressive annual rate of 4.6% in 2017 and accelerating to 5.0% in Q1 and Q2 2018. Capital Economics (July 2018) reports that wages are growing at close to the fastest pace since before the financial crisis and, according to an European Commision (“EC”) survey, the share of firms reporting that labor shortages are a key constraint to production is at the highest in the 26-year history of the series. Strength in the labor market suggests that core inflation is set to pick-up.

• The EC remains concerned about the rule of law in Poland and that recent reforms to the Polish judicial system have compromised its independence. Dialogue between Poland and the EC is ongoing through formal channels. Potential consequences if Poland fails to comply with EU law include the loss of Poland’s EU voting rights and EU funding, potentially impacting medium- and long-term growth.
FX RATES

- The USD maintained its relative strength in currency markets through August 2018 compared to long-term trends. In 2018 year-to-date, following recent months of weakness in international currency markets, the Colombian peso, Brazilian real, Uruguayan peso, Euro and Polish zloty are all down to levels not seen since the 2014-2015 currency collapse. The greatest drop has been in Brazil, where the BRL depreciated 17% year-to-date against the USD, in part due to political uncertainty leading up to the October presidential elections.

REFERENCES


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IMPORTANT INFORMATION

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