

NZ LOG PRICES IN 30 YEARS

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The author offers a quick opinion of the direction of future log prices for New Zealand suppliers, given global trends and developments. He notes that despite the rising demand for wood, no-one is speculating on log prices. Overall he concludes that they will continue to trend down in real terms, and anyone contemplating planting should seek to keep costs low and maximise non-wood benefits as well as forest yield.

Global forests and their ownership

Wood comes from natural or plantation forests. At the moment plantations account for around 5% of global forest area but produce roughly 35% of the annual cut. Because they are more productive than natural forests, plantations are increasing in number and area. Close to half of the world's plantations are located in China, Russia, and the United States¹.

About 86% of the 3.9 billion ha of the world's forests are publicly owned. The balance is owned by businesses or individuals. This has a profound effect on global wood prices. A forest owned and managed as a 'God forest,' i.e. one established either naturally or without thought for the costs, can be run on a cash flow basis. A 'Capital forest' where the cost of establishment or purchase is acknowledged and an attempt is made at earning a return on that investment, is generally run on a capital asset basis.

One will harvest a God forest for as long as the selling price of the timber is higher than the cost of extracting it. In theory one would harvest a Capital forest only if the selling price of the timber exceeded both the extraction cost and the necessary return on capital. Generally, governments and communities run their forests on a cash flow basis while businesses run theirs on a capital asset basis.

Because wood is traded internationally, timber grown on the capital model competes in the market with timber grown on the cash flow model (illegal logging is a classic example of the cash flow model at work²). The cash flow model dominates, which constrains the return on investment for businesses using the capital model.

What that means to New Zealand

Virtually all exotic forests in New Zealand are Capital forests. Further, the reforms that removed price control and industry protection in the 1980s have ensured that wood prices in New Zealand are determined by export log prices. These are subject to exchange rates and the cost of shipping from New Zealand to northern-hemisphere customers. Accordingly, wood grown under our capital asset model is sold domestically at international prices

¹ E Mygatt, *World's Forests Continue to Shrink*, Forest Cover April 4, 2006: The Earth Policy Institute, USA <http://www.earth-policy.org/indicators/C56>

² "Illegal logging has been estimated to depress the average log prices for New Zealand growers by 10.6%." Future Drivers for New Zealand Forestry, MAF, Wellington 2008.

that are determined by exchange rates, shipping costs and the suppliers of wood from cash flow forests elsewhere in the world – for example, Russia, Europe and Canada.³

Being at the end of the supply chain, New Zealand forest growers receive log prices that reflect the sum of the costs of all of the parties supplying end-users in this price-constrained market.

Demand for plantations

The world's population continues to grow. Global wood consumption is growing even faster, because per capita consumption of wood increases as people earn more. Ignoring climate change, by 2050 the world will need more than 100 million hectares of new commercial forest plantations⁴. Plantations can be 40 times more productive than natural forests. Globally they are increasing by about 5 million ha a year. Growers are focussing on fewer species which (like radiata pine) grow quickly, have desirable wood properties and respond well to early management. Genetic modification is accelerating this development.⁵

The WWF in its 'Living Planet Report 2012' argues that people are consuming 50% more resources a year than the Earth can replenish⁶. However this does not apply to wood production: the report shows that WWF's concerns for forests are about wildlife and carbon, and while those are valid and serious issues

³ "Africa, Asia, and Europe have the highest percentage of public forest land by country, at 98%, 95%, and 90%, respectively. This includes all the forest land in China, Congo Democratic Republic, and the Russian Federation. Oceania has 76% public forest land, North and Central America 70%, and South America 82%." Siry, Cabbage, Newman Global Forest Ownership: Implications for Forest Production, Management, and Protection, XIII World Forestry Congress Buenos Aires, Argentina, Oct 2009: http://www.pefc.org/images/stories/documents/external/global_forest_ownership_FD.pdf

⁴ Does the world need planted forests? Sutton, Intercessional Expert Meeting on the Role of Planted Forests, Santiago, Chile April 1999: <http://www.fao.org/forestry/5858-0a0518f6376acc009da89bfabbff25468.pdf>.

⁵ *Futuragene starts final Brazilian field trial for yield enhanced eucalyptus plantations*. Business Wire, May 2012: <http://www.businesswire.com/news/home/20120502005119/en/FuturaGene-Starts-Final-Brazilian-Field-Trial-Yield>.

⁶ Living Planet Report 2012 WWF Switzerland, May 2012: http://www.panda.org/about_our_earth/all_publications/living_planet_report/

they do not affect log prices. In terms of wood, if new plantations were 40 times as productive as natural forests, and added 5 million ha pa to a 4 billion ha global estate, then - when they were ready for harvest - they would add 5% a year to the global wood supply. Annual deforestation rates are around 0.3% a year. (E Mygatt, footnote 1).

It is not clear whether this increase in wood supply will mean higher or lower log prices. Some of the new plantations are acacia and eucalypts with short rotations (5-6 years), while others are pines with longer rotations (15-35 years)⁷. Of course all plantations are Capital forests which require high log prices; and establishment costs will rise as the cost of land yields to population pressure. However rising cost is driving research into even higher productivity in wood yield per hectare. Logically productivity increases should trail demand simply because forests take years to mature, but rotation length is a primary target for productivity improvement. The shorter the rotation lengths, the less scope there is for log price increases.

Competing log suppliers

The major timber exporting countries are Europe, Canada and Russia. All three regions have big problems at present. Europe has a sovereign debt crisis that threatens its banking system and cross-border trade. Canada has a bark-beetle infestation that has affected 16 million ha of forest, resulted in a massive overcutting of diseased stands and created a timber shortage. Russia has serious infrastructure problems and is having trouble attracting investment. All of these economies would benefit from higher log prices, but they compete with one another and are likely to continue doing so. The future of the yield and log prices from these countries' publicly owned forests is not clear.

Climate change

Oil, coal, gas and electricity are the lifeblood of all industrial economies. Consequently supplies are developed, priced and allocated by governments and large corporations. The major industries of steel, aluminium, plastics and pharmaceuticals heavily rely on these four feedstocks. Although wood products can substitute in each of these processing industries it has been hard for them to compete politically. Climate change and rising energy prices are starting to change that. Timber has a lower level of 'embodied energy'⁸ than some other materials, and

⁷ Del Lungo, Ball, Carle: *Global planted forests thematic study: results and analysis. Planted Forests and Trees Working Paper 38. FAO, Rome 2006: <http://www.fao.org/forestry/12139-03441d093f070ea7d7c4e3ec3f306507.pdf>*

⁸ "Embodied Energy is the sum of all the energy required to produce goods or services, considered as if that energy was incorporated or 'embodied' in the product itself." Wikipedia, May 2012: http://en.wikipedia.org/wiki/Embodied_energy

using timber instead of them can reduce greenhouse gas emissions. Wood supplies are renewable, offer diversification, may be sourced locally and are less subject to international tensions than oil or gas.

New technologies

Globally the demand for wood products is growing rapidly. Engineered wood products like Laminated Veneer Lumber and Cross-Laminated Timber are light, strong, stable and predictable, and compete in price and performance with structural steel and concrete. Both generally use high grade timbers on the surface over low-grade timber cores. Engineered wooden buildings can be fast to erect, earthquake resistant (and repairable), energy efficient and offer large, clear floor areas.

New technologies are using wood as a source of fine chemicals, biomaterials, pharmaceuticals, biofuels and bioenergy. Investment is going into cost-effective substitutes for petroleum based products to reduce supply dependency and price volatility, and to increase the 'green' content of end products. Chemical processes can transform lignin, cellulose and xylose into thermoplastics, resins, confectionery, rayon, solvents and liquid fuels.

These developments attract investment, create jobs and help trade but will not necessarily translate into higher log prices. All of these new products and technologies are designed around generous supplies of low grade wood. Further, there appears to be no plan to down-scale these new technologies for distributed processing. If they are built, most of them will be large, centralised plants close to existing sources of waste wood. Growers of low grade wood distant from these processing centres will remain vulnerable.

Bio-energy

Woody biomass is increasingly important for energy production in developed countries. Sweden and Finland are already producing around 30% of their national energy demand (heat, electricity and transport fuels) from biomass⁹. Europe hopes to source 20% of its energy needs from renewable sources by 2020. Energy conversion is one of the few easily scalable wood processing technologies available today. It can be low capital cost, low operating cost and highly efficient, as it can operate 24/7 compared to wind and solar. Equally importantly, it can be small enough to install near its fuel supply to minimise haul distances. The most efficient plants

⁹ Biomass generates 32% of all energy in Sweden, Renewable Energy World, June 2010: <http://www.renewableenergyworld.com/rea/news/article/2010/06/biomass-generates-32-of-all-energy-in-sweden>. World's largest biomass gasification plant to be deployed in Finland, the Earth Times, June 2011: <http://www.earthtimes.org/energy/worlds-largest-biomass-gasification-plant-finland-metso/996/>

sell their process heat, make co-products and do not rely on seasonal biomass.

Environmental services

The value of the environmental services that forests provide is becoming more widely appreciated, although few mechanisms exist yet to reward forest owners for providing them¹⁰. Indeed, the trend is to take values off forest owners by public pressure or legislation, without compensation, on the basis that even private forests are a 'public good'. Fortunately most environmental attention is being directed to natural forests, which is further encouraging the shift in production to planted forests (i.e. away from 'God forests' to 'Capital forests'). As more environmental values are monetised - water, erosion control, recreation - opportunities might arise for higher returns to forest owners. Conversely penalties might be imposed on those who fail to respond to public expectations.

Our major export markets are China, Australia, Japan, Korea and USA (75% by value). Three of these are discussed below.

Markets - China

In China demand for timber for housing and construction is continuing to grow at twice the pace of the economy as a whole, and the country is a major wood importer despite the massive reforestation of degraded lands over the last 20 years (which is still running at over 3 million ha a year). The country has built a large number of processing plants that need increasing amounts of energy and imported raw materials. Electricity supplies are not keeping pace with growth and some mills are closing or relocating because of brown-outs. Chinese sawmillers are investing in the Russian Far East and looking elsewhere around the world. The rationalisation of Chinese industry will continue while the government struggles with three major issues: environmental pollution; ensuring a more socially acceptable distribution of wealth; and adapting to a growing social consciousness.

China has a policy of importing raw materials and exporting finished goods.¹¹ As a major exporter it is

¹⁰ *Carbon credits and the REDD programme are the first movers. "Figures vary, but it is clear that REDD+ may bring considerable payments to developing countries, perhaps over US\$100 billion per year." UN REDD programme newsletter, UN July 2010: http://www.un-redd.org/Newsletter10/MRV_and_Monitoring/tabid/4864/language/en-US/Default.aspx*

¹¹ *"(There is) a series of encouraging and preferential policies that the government applies to imports of raw materials (mainly energy and natural resources)...." Competition & Trade Update in China, Salans LLP newsletter, Shanghai March 2012: <http://www.salans.com/~media/Assets/Salans/Publications/1203%20Salans%20CompetitionTrade%20in%20China%20Newsletter%20En.ashx>*

able to back-fill empty containers with raw materials from its trading partners and return them at low cost. This has worked well to date and subject to the pressures above is expected to continue. Logs have a low value density and it is possible that China will reduce log imports in favour of semi-processed wood in the medium term while it rearranges its electricity supplies but this does not mean that log prices will necessarily rise.

Markets - Australia

Australian plantations total 2 million hectares, but new plantation development has stalled because land that can grow trees at suitable rates is too expensive to offer an attractive rate of return given current log prices (the curse of 'Capital' forestry). There is projected a growing gap between sawn wood supply and demand between now and 2050 if the country's population increases. To maintain the current supply balance, Australia needs an additional 500,000 ha of plantations before 2050. Much of the sawn timber is used for new house construction. Although usage has trended down over the last 10 years as timber has lost market share to steel and concrete, climate change initiatives may reverse this.

Markets- USA

In the USA housing starts are beginning a slow recovery and unemployment has fallen over the last two years. Despite its enormous debts the USA is still the strongest economy in the world and all forecasts are that slow growth will continue. In theory log prices should improve as demand picks up, encouraging Canada to redirect its exports from China into the USA. However America's own forests are growing, not only in total area but in productivity as the forests are better managed¹². Like Europe, the country is growing wood much faster than it can use and it is not clear what this will mean for log prices.

Summary

While there are many conflicting factors driving log prices, global demand trends are for wood consumption to continue to rise. Supplies will increasingly be sourced from plantation forests, which are growing in area and in productivity around the world. Climate change and rising energy prices are encouraging more planting, and new technologies are looking to woody biomass as a feedstock for a number of industries. These developments are exciting processors and investors but they are focussed on using increasing volumes of low grade wood. The rising demand for cheap low-carbon feedstocks is in tension with the need to generate an

¹² *"Overall, annual growth of U.S. forested acres exceeds harvests and losses to insects, fire, and disease by 33% each year in the commercial forests." University of Georgia School of Forestry, May 2002: http://www.bugwood.org/intensive/forests_and_timberland.html*

adequate return on capital from plantations. This tension is encouraging research into higher forest yields to reduce costs; for example through better forest management, more careful species selection and genetic modification.

Conclusion

It seems to me that overall, the trends are channelling forest owners into a classic race: higher demand will push prices up, while higher productivity will push prices down. Over the years, across all industries, this race has always been won by productivity. Prices have fallen in real terms. Given that, and the fact that prices are likely to remain dominated by cash flow forests for some time, the outlook for New Zealand log prices over the next 30 years is generally discouraging. Of course there will be ups and downs along the way. If one grew a productive forest at low cost and captured all of its non-wood values, it could still be a good investment.

Opposing views

My views have been criticised by a number of respectable people. I agree that there are several factors that might encourage a more favourable outlook.

- Pines are the most popular plantation species world-wide¹³ and amongst them, radiata is one of the most productive. With years of research on radiata behind us we have a head-start in forest productivity, and it will take some time for other countries growing less productive varieties to catch us. [*Of course most of those countries are closer to global markets than we are and some have cheaper land, so our productivity lead is not everything.*]
- Environmental pressures will restrict harvests from natural forests. Under climate change forest protection will tighten to prevent carbon emissions, while at the same time demand for low-carbon wood products will increase. This will lead to shortages and price rises. [*Price rises over the next 10 years would certainly encourage more planting of both short and long rotation species. Whether that would mean higher returns when those new forests matured many years later, is an open question.*]
- Chile has successfully developed profitable forest industries from plantation forests, and we can learn from their experience. [*Chile has succeeded through industry growth arising from government intervention and subsidies; a broad political consensus on the benefits of foreign investment; and 60 active free trade agreements that include Europe, the USA and China. We do*

- not have the same political direction.]*
- Productivity has outstripped demand across all industries in the past because of cheap energy. As energy costs rise, productivity gains will fall. That means log prices should rise as demand will exceed supply. [*Most productivity gains in forestry will come from species selection, better forest management and genetic improvement, none of which are energy intensive.*]
- The key to forest investment is profit, not log prices. Falling log prices in real terms do not mean falling profitability. [*I agree. However I would be interested to see an analysis of future forest operating and harvesting costs.*]

¹³ Brown, Ball, *World View of Plantation Grown Wood*,
FAO, Rome, circa 2000: <http://www.fao.org/forestry/4596-0bc06e1b1190f66bb48651bfd756f37fd.pdf>