



Forestry Decision Making in a World of Uncertainty: Is New Zealand Forestry on the Right Track?*

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In the 1960s the philosopher and poet Bob Dylan wrote the lyrics:

**"The loser now will later to win
The times, they are a-changing"**

Hardly insightful, you might think, and often repeated in one form or another. But like many insights, they only become 'obvious, common sense' once they're made explicit. Before that event people went along as before, unthinkingly following the crowd; after that event there is a rush to claim 'I've always known that'.

But back to Bob. He is right. The future will change, and it will surprise us. We do not know what the future holds. Who doubts that? Yet many decision-makers still treat the future as an extension of the past — that assumption being implicit in many of the decisions they make. We deny much of the uncertainty present in the future, perhaps because denial is an easier strategy than accepting it. History is rife with examples of future change and uncertainty being discounted, and they make enjoyable reading. Witness the following:

"I think there is a world market for maybe five computers."

Thomas Watson, Chairman of IBM, 1943

"There is no reason anyone would want a computer in their home."

Ken Olson, president, chairman and founder of Digital Equipment Corp., 1977

"This 'telephone' has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us."

* Paper delivered at NZIF Seminar tent, F198 Rotorua Feb 98. Submitted as Commentary, NZ Forestry.

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Western Union internal memo, 1876.

"The wireless music box has no imaginable commercial value. Who would pay for a message sent to nobody in particular?"

David Sarnoff's associates in response to his urgings for investment in the radio in the 1920s.

"Who the hell wants to hear actors talk?"

H.M. Warner, Warner Brothers, 1927.

"We don't like their sound, and guitar music is on the way out."

Decca Recording Co. rejecting the Beatles, 1962.

"Heavier-than-air flying machines are impossible."

Lord Kelvin, president, Royal Society, 1895, here both denying and supporting his own maxim on measurement at the same time. Double irony! *"When you cannot measure it, your knowledge is of a meagre and unsatisfactory kind."*

"Drill for oil? You mean drill into the ground to try and find oil? You're crazy."

Drillers who Edwin L. Drake tried to enlist to his project to drill for oil in 1859.

"Stocks have reached what looks like a permanently high plateau."

Irving Fisher, Professor of Economics, Yale University, 1929.

"Aeroplanes are interesting toys but of no military value."

Marechal Ferdinand Foch, Professor of Strategy, Ecole Superieure de Guerre 1914.

"The abdomen, the chest, and the brain will forever be shut from the intrusion of the wise and humane surgeon"

Sir John Eric Ericksen, British surgeon, appointed Surgeon-Extraordinary to Queen Victoria 1873.

"640K ought to be enough for anybody."

Bill Gates, 1981, 'Life's Struggles'.

To these we could like to add a few more.

"Why would anyone want to grow Redwood when radiata pine is so much the superior wood and better investment?"

An FRI wood technology scientist who will remain nameless.

"Radiata pine will return you between 8 and 12 percent real."

Just about every investment prospectus you can think of.

"I don't know why they're planting Douglas-fir. I've done the figures. They won't even make 6 percent!"

A forester who will also remain nameless.

"We won't have to grow anything but fibre crops of radiata pine in the future. Engineered wood products and new technology will make solid timber obsolete."

An engineer who will also remain nameless. Repeated by an economist (also nameless).

"We don't need to prune the last lift. I've done the figures and it doesn't make the required return."

Another forester.

Bob Dylan's insight about uncertainty is being quietly ignored by many decision-makers in New Zealand forestry. New Zealand forestry has an over-reliance on quantitative decision support systems (DSS) that largely project a certain past into an uncertain future. It could be argued that foresters have been dominated by those professions that are perhaps overly concerned with the quantitative and the supposedly objective — financiers and scientists. The reliance on quantitative systems deserves questioning. The industry would benefit from developing more strategic and pragmatic approaches to forestry decision making, which include consideration of intangibles, and the absolute certainty of change. Many of the

newer entrants into the industry do illustrate a broader perspective, but their approach is still not accepted by many in the industry.

There is a particular over-emphasis on discounted cash flow techniques that extrapolate the past into the future, even to the point of allowing such techniques to set strategic direction. On a related theme, we have such an obsession with the cost of capital, often as if it were the only relevant variable for future investment success, that we do exactly as John Ralston Saul wrote in his book 'Voltaire's Bastards'. That is, we abdicate thought, and remove ourselves from both broader, common sense considerations, and moral considerations of society and the environment. These parts of the business environment are as real as the quantitative variables. They should not be sacrificed on the altar of spreadsheets. Ignoring them only serves to increase the inherent risk and uncertainty of any investment decision.

Of risk, uncertainty and objectivity

Most New Zealand forestry decision-makers accept the reality of quantifiable future risk, however the future, intangible uncertainty associated with society, competitors, markets and the environment is often ignored. This is despite uncertainty rather than mathematical probability being the ruling paradigm in the real world (Bernstein 1996, p228, quoting JM Keynes). When, and if, sensitivity analysis is practiced it is confined to the quantitative variables, because that is the world within which many forestry decision-makers live. Following Lord Kelvin's maxim on measurement, if something cannot be measured, then that something is best not considered by people who pride themselves on a 'rational' perspective. To do so, they perhaps believe they risk criticism for lacking objectivity. Both scientists and economists run scared of accusations of value judgments, without realising the narrowing of perspective that results from following such a catechism, and the irony given that that code represents a social value in itself. It may be an appropriate value for science, but making a decision about investment is entirely a different matter.

The myth of 'objectivity'

This obsessively quantitative, 'rational' perspective is a charade. The irony is that, while trying to claim 'objectivity' and denying any vestige of 'subjectivity', few people appreciate that the choices and measurements they make have a subjective element. One of the accepted philosophical and psychological realities is that observation is theory-laden. What we

'see' and assume is 'objective' is influenced by the values we hold, our knowledge, our perspectives, our beliefs. One person will see the mud at their feet, another the stars reflected within. A Victorian would see a scandal where we today might see only humour.

To illustrate this point, answer the following: "Is managing a forest simply farming capital, growing a crop, or managing a biophysical system with a social dimension?" Your answer to that question influences what variables you choose to consider, what ones you choose to measure, and what values you place on those quantitative variables. All three dimensions have subjective elements.

Subjectivity and decision-making

Subjective judgment, which puts the data into a wider context, is necessary to complete the decision-making process (Bernstein 1996). If we acknowledge the subjective dimension to decision-making then it follows that there are as many interpretations on the available and chosen data as there are human beings involved. This difference in interpretation depends on the different world views involved (individual ontologies), as well as the different motivations of decision-makers. These vary enormously with chosen management strategy. By way of example, many farmers are motivated by whole farm economics, having land that is commercially productive, aesthetics, or shelter. Many corporates' strategies to ensure future commercial success may involve a focus on quality, or a particular vision of the future. The figure derived at the bottom of a spreadsheet is only one small dimension of the decision-making process. In some instances, it may not be a relevant dimension at all, perhaps because it runs counter to the chosen strategy involved.

If this integration of the subjective into decision-making was accepted in New Zealand then we ought to see tolerance of different approaches to forestry management. However, tolerance of differences is not that apparent. Those who practice a different decision-making approach than the New Zealand financially dominant creed remain subject to critique, while those who do the critiquing fail to see their own subjective values being exposed in the process.

Contemplating the future

The necessity to appreciate the subjective context of decision-making is particularly so in projecting the future, something all foresters must do. The future **must** involve subjective judgment. You cannot know the future. You can only make an informed judgment, project the past or

wildly guess. Those with the broadest perspective — dare I say those with some Humanities background to complement and temper their Commerce or Science backgrounds — are the more likely to pick the right road. I will dare further in saying that the people most likely to **not** get it right are those Dr Strangeloves buried in their petrie dishes, or those cloned Milton Friedmans focusing on their spreadsheets, in denial of uncertainty. I confess that these people scare me!

One thing is certain: the future will not be like the past. Depending on the business structure, a strategy of projecting the past probably has the least going for it for two main reasons. Firstly, whoever plays that game is sure to be in a poor position compared with an investor who consciously considers the future social, ecological and economic trends. They will have more chance of catching the next wave that comes along, and the profits and market share that is associated. Trying to catch the next wave by focusing on the wave that's just gone past seems a dangerous strategy. The next is bound to be an unpleasant surprise. I think the term is 'wipeout'.

Secondly, any strategy that involves chasing the number at the bottom of the spreadsheet is sure to involve the companionship of a number of fellow believers. The pack might get rather large. As common sense should tell us, unless supply remains below demand for the particular product (specifically, for largish branched, highly tapered, radiata pine logs with a high proportion of juvenile wood, encouraged by chasing a high IRR or using a high discount rate) then you should expect entry costs to rise and product prices to drop. The 'Projected' returns may not relate at all to the 'Actual' returns achieved.

As an illustration, it might be enlightening to compare the actual investment success of a small number of Douglas-fir growers (whose projected IRR, if they bothered to do the calculation, just happens to be 6%), with the actual success of a very large number of growers of radiata pine proudly projecting an IRR of 12% 30 years before the event. Oh, for a time machine to replace my simulation model.

The uncertainty of the actual outcome cannot be reasonably denied. It could very well be that the current projected financial 'loser' (Douglas-fir, Redwood etc.) could actually outperform the current projected 'winner' (radiata pine managed to minimise the cost of capital). The former may be in a position to dictate price for all log types, the latter forced to take the price for only a proportion of the potential production.

To deny the subjectivity and uncer-

tainty involved in projecting the future, and to focus on only the available, past, quantitative data is analogous to driving a car while looking into the rear vision mirror (forgive yet another metaphor). Worse, extrapolating the past in the interests of 'objectivity' involves an implicit assumption (that you **can** extrapolate) that is itself subjective — a circular argument. The farther into the future you deny the relevance of subjective judgment, the more the analogous car accelerates.

Is such an approach either objective or rational? (Good luck on the turns.) The implicit condemnation of subjectivity in so much of our decision-making is the irrationality.

A quote credited to Bill Studholme, Manager Selwyn Plantation Board, circa 1982 to a group of forestry students is relevant to this discussion. He obviously recognised the assumptions and uncertainty within discounted cash flow:

Q. "Mr Studholme, could you please tell us the IRR for this particular stand."

A. "Certainly. Which one would you like?"

Understanding the context surrounding decision support systems

Many people will defend decision support systems on the basis that it is not the DSS that is at fault, but rather the understanding of the user that results in faulty application. This is an entirely appropriate point. Artificial DSSs can only work with that most sophisticated of decision support systems attached, the human brain. Yet time and time again people use artificial DSSs, often where entirely inappropriate given the particular circumstances, and worse, do the unforgivable, and turn their brains off completely. They let the thing dictate the answer while mouthing platitudes such as: "It's only a guide" when they actually treat it as a **guide-dog**, dragging their blind carcass along behind! This is one of the reasons why DSSs are getting a bad name.

Many, if not most users don't consider, or even understand, the many intangible variables which a DSS might not cover but which a human brain will. They do not appreciate the assumptions within the models, or the fact that many times they are dealing with a mythical average of, for argument's sake, a forest site (the statistician with her head in the oven and feet in the freezer, who, on average, feels fine, is à propos). Nor do they temper the result with consideration of the objectives, resources, constraints and chosen strategies of the decision-maker (even, at times, if that decision-maker is themselves!). To compound the irrationality, the wider con-

text of society, economy, competitors, environment, and markets is considered too disparagingly 'soft' to warrant the attention of their 'objective' and 'rational' professionalism.

The result of such a limited perspective is the reduction of a 'soft' system, involving uncertainty as well as intangible and qualitative variables relating to social, psychological and biotic parts of a system, to a 'hard' quantitative system where mathematics can provide some myth of certainty. Reductionism of this nature is philosophically unsound, much like trying to reduce a representation of a multidimensional model to only the x and y variables on graph paper.

A suggestion for a better decision-making framework

New Zealand should move away from its use of decision support systems as surrogate intelligence and limit them to their rightful place. If foresters want to make decisions for the future they need to recognise and acknowledge a number of points:

- Future uncertainty is a reality.
- Decision making involves the use of subjective judgment as well as objective data.
- The best decisions regarding the future are likely to be made where a broad perspective is applied, including likely actions and reactions of competitors, trends, markets, etc.
- Developing a strategy based on a broad range of 'soft' as well as 'hard' information comes before use of decision support systems (DSS).
- There is no such thing as the right decision for everybody.
- The most successful strategies for long-term industries will probably be those that include a range of options — e.g. of species, regimes, locations, markets.
- Beware of maximising anything because it will probably come back to bite you.
- DSSs must be used only in the appropriate strategic and business environment context.
- If you don't know the relationship between the DSS and the real world, then don't use it.

An example strategy for an independent forest grower

A hypothetical forest grower might want a number of things in their strategy (Note: it is not my intention to advocate this particular strategy, it is to illustrate a point):

- Inception of **early cashflow** (for a 'greenfields' forest) to keep the banks

at bay.

- The ability to **dictate price** by growing something that people are likely to clamour for, rather than something that will be readily available and therefore a price taker.
- A range of **options** of silviculture/site/markets to cater for uncertainties and risks
- A focus on **consistent quality** of product and associated service to minimise the uncertainty of buyers that is manifested in a discounted market price, resulting in better marketability and better returns as a preferred supplier.
- Accept a philosophy of **managing an ecosystem** rather than a 'fibre crop' to cater for both social and the environmental values within a forest and downstream, with the purpose: (1) of reducing potential future social and environmental risk by understanding potential problems before they arise, and (2) to provide for potential future non-wood commercial options which might otherwise not be either recognised or even available within the forest (have others ever thought such a multiple-use strategy could increase options and decrease risks?).
- A focus on a **system that is not additive to high artificial inputs** to reduce the capital investment needs and reduce the environmental, economic and social risks that is inherent in such paradigms — maximising production of one variable should never be an aim, optimisation is the chosen goal.
- **Vary silviculture to match microsite** parameters (both ecological, economic and social) — no blanket regimes.
- Provision of local **public participation** in forest management decisions to minimise risks and provide long term marketing and political returns.
- **Watch competitors** like a hawk to ensure a 'pack' with similar strategies doesn't form, while remaining an honourable fellow corporate.
- **Avoid any short-term decision** that might compromise long term survival. Measure time in decades, not months.

These suggestions illustrate the major theme in this paper: if maximising IRR or minimising cost of capital was the aim, or if a purely production forestry model was used, then not one of these strategic focuses would necessarily result from the analysis. Whether right or wrong, they are purely strategic, and are formed with a far broader context in mind than the merely quantifiable.

Conclusion

Is New Zealand Forestry on the right tracks? I believe it's moving in the right

direction but it's not there yet. The last 15 years have seen a dramatic improvement in decision-making. As an industry we are willing to ask and tolerate a greater diversity of approach than in the past. A growing range of corporate strategies is apparent.

We can only speculate on why this improvement has occurred. Removing the State-owned parts of the sector from Treasury maxims to "make 10% return" is definitely a factor. Treasury did not have any understanding of the implications of such a narrow criterion in relation to forestry. The major implication was that the Forest Service ended up chasing risk in order to achieve the IRR nirvana desired.

This is not a criticism of State foresters, or the Forest Service. Many State foresters intuitively knew the absurdity of that decision criterion, but they were not the ultimate decision-makers. Had these foresters been allowed to develop their own approaches without

Treasury's 'helping hand', the industry may have developed a more sophisticated approach sooner. However, the Treasury-economist cultural legacy still has its strongholds.

The overseas companies have brought a breath of fresh air with their decision making approach. The variables they consider are obviously broader in scope, and include the quantitative and the qualitative, the subjective and the objective. Generally their decision support systems are more likely to be used as 'guides', in the truest sense of the word, within a strategy, rather than as a 'guide-dog' leading a blind, deaf, and not too thoughtful follower.

I believe we still have the legacy of the narrower approach. I for one am not so bullish about the future of radiata pine, particularly managed with a large spreadsheet number in mind. Our markets know that we have a lot of it, they don't think too highly of its quality, new processing

plants are not eventuating (though they might if prices drop with oversupply), and they understand they have a buyer's market. This is not to say forestry is a bad investment. I believe it's a winner in the long term, but we probably have our product mix wrong.

Only a more sophisticated decision-making process will ensure long term success. Next time you hear of someone putting in redwoods, don't listen to the guy who says the IRR doesn't stack up! When people are more critical of the spreadsheet worshipper than the visionary, you'll know our industry is on the way.

References

- Peter L. Bernstein, 1996: "Against the Gods: The Remarkable Story of Risk"
John Ralson Saul, 1993: "Voltaire's Bastards: The Dictatorship of Reason in the West"

Chris Perley

PERTINENT POEMS

ODE TO DISCOUNTED CASH FLOW

There once was a man
who aspired most grand
for a quantum of Present Net Worth.
He computed and schemed
with an historical theme
and waited — with faith — for the purse.

Alas for the man,
who aspired most grand,
others had seized on the plot.
The result was a glut,
a most terrible fut,
and our man...he got not a jot.

"I shall not scoff again",
said the humbled most grand,
"at he who would differ and doubt
and propose the litation,
a most Strange speculation!,
to plant all in redwoods...naught else."

"The moral is clear",
said an innumerate peer,
"that calculus is only one part
of any one process
that wants to be noticed
when investment success is at heart."

It may split a hair
to reiterate here
what common sense must impart —
that obvious notion,
yet one of great potion,
The Future... is NOT... like the Past.

Chris Perley

To which a forest economist submitted:

An economist said
as he lay in his bed
"to work no more, I aspire.
I've figured a deal
at eight percent real
this means that I can now retire".

So he went to his bank
and ten thousand he sank
in portfolio Treasury bonds.
For a term - 50 years
on the advice of his peers
that forever inflation was gone.

Advice later found
Fundamentally unsound
With shock he would later recall,
when he put out his hand
for four and sixty nine grand:
"We have no currency that small".

The moral is clear
to advice we adhere
the risks they are many and varied.
We with certainty learn
of our Rate of Return
on the day when we're finally buried!!!

Chris Brown
Formerly MOF, now FA