

# **Prosperity or Poverty?**

## **Choices facing New Zealand**

**A paper by Warwick T Bishop**

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## Introduction

In a period of just 25 years New Zealand's wealth ranking has slipped from 3<sup>rd</sup> place, (measured in terms of Gross Domestic Product per head) to about 25<sup>th</sup> place in the world. Most New Zealanders are just as uncomfortable with their national sporting teams losing a game as they are with the idea of becoming relatively poorer. They know things are not currently right with "the economy", or more correctly "the country". and they know something needs to be done to change this situation. Most kiwis are less bothered about what has gone wrong in the last few years than they are concerned about what must now be done to fix things.

***In other words they know it is not just a question of "changing the coach" or "changing some of the team". They also know it is time the country looked at new "training methods" and maybe even a new way to "play the game".***

This paper attempts to analyse what caused this rapid change in New Zealand's world wealth ranking. It also tries to explain what must be done to stop any further decline in the country's relative standard of living. More importantly it points out what must be done to assist this small nation to begin to climb back up the international wealth scale again.

After a brief look at the history of New Zealand's wealth creation sectors and an analysis of some of the options facing the country, the paper discusses the best direction for New Zealand to head if it is to achieve a sustainable rise in the standard of living. The part technology must play in any plan is discussed along with the vital, but different, roles of the Scientist, the Professional Engineer and the Engineering Technologist in a modern, knowledge-based and increasingly sophisticated technological society.

Before New Zealand can begin to benefit from many of the reforms of the last fifteen years and start to be successful in the emerging "brain intensive" world there are a few critical issues that need addressing.

**These fundamental issues are: Education, Finance, and Marketing.**

## Background

### **Wealth does not just happen it has to be created**

For an individual, a group or a nation to become wealthy they must **grow** things, (farming); **find** things, (hunting, fishing, or mining) or they must **make** things, (build, manufacture, or produce).

Note: Many service industries create wealth by producing "things" that are purely a benefit to the consumer. They may not exist in quite the same way as a manufactured product. Theatrical performances, software, or a tourism "experience" are just some examples.

### **There is no other way to create wealth**

It can be traded, (by Financiers and the Stock market), it can be analysed, (by Economists), it can be counted and projected, (by Accountants) or it can be argued over, (by Lawyers and Politicians).

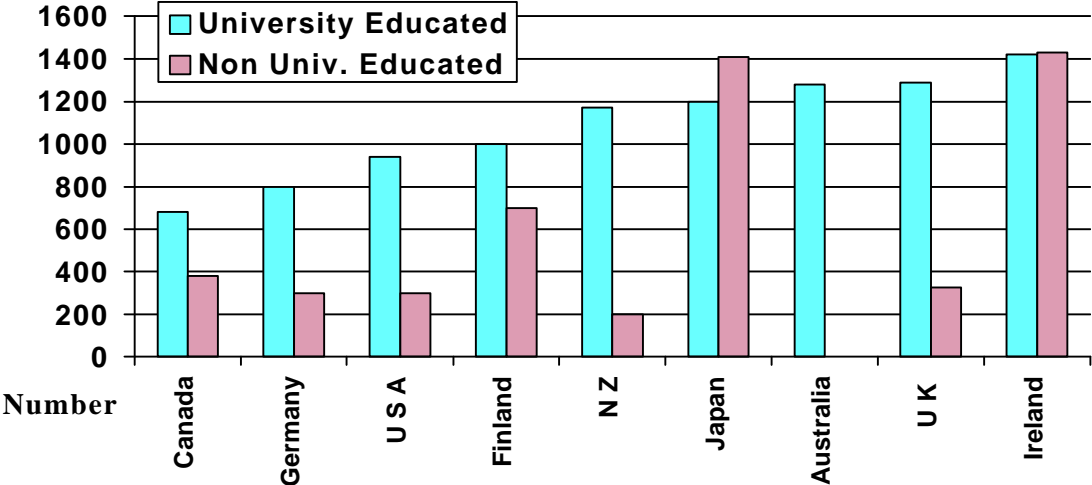
**None of these activities adds to real wealth.** All these actions do is move wealth around - as many New Zealanders found out in the mid-1980's. What New Zealanders now need to do is stop debating who should get which slice of the existing economic "cake" and instead put all their energies into baking a much bigger cake.

Wealth creation requires the skills of scientists, engineers, engineering technologists, farmers, risk-takers, entrepreneurs, manufacturers, etc. In turn, these people need the services of the rest of the community, be it political, financial, legal, economic, marketing, selling or maintenance help to succeed.

**Does New Zealand produce enough scientists?**

Surprisingly, and despite much of the rhetoric to the contrary, the answer would seem to be a resounding "yes" based on a direct comparison with our OECD partners. The overall numbers of science graduates produced each year by New Zealand Universities compares well on a pro-rata basis with many other technically successful countries - at least when compared as a ratio with other University educated people aged 25 to 34. (See Chart 1 below).

**Number of Science Graduates per 100,000 persons in the labour force 25 - 34 years of age**



Ref: OECD - 1995 CHART 1

New Zealand still has a low overall percentage of people with University qualifications however, and this tends to show up more clearly in these 1995 OECD ratios when the comparison is made with the non-university educated, 25 to 34 year old, section of the community.

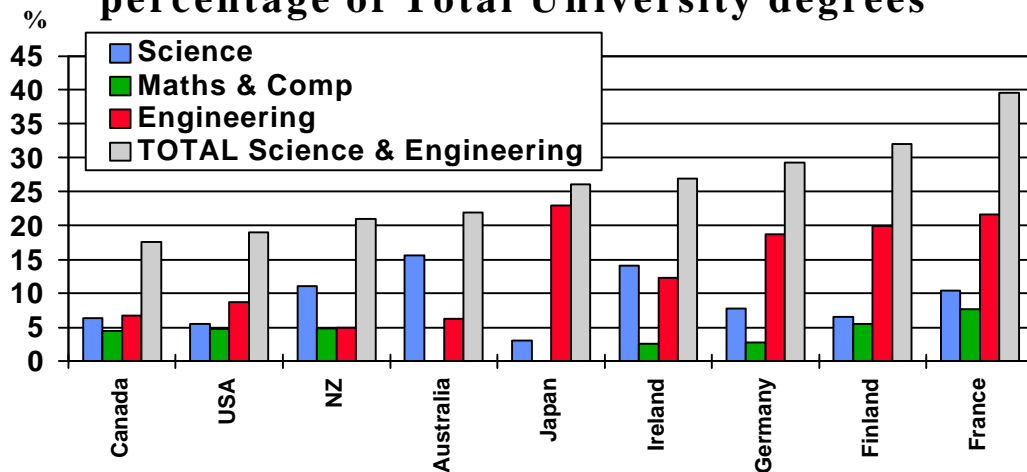
If New Zealand is producing such a reasonable number of scientists each year the next few questions that need to be asked are:

- "Where are they all and what are they doing?"
- "Are they the right type of scientists with the right mix of skills?"
- "Are they working on the right type of projects?"
- "The government spends \$600 million a year on Research and Development, or about \$5 billion in the last decade, so where are all the benefits?"
- "Where is all the wealth that this R & D should have created by now? That much R & D over a decade should have resulted in a doubling of New Zealand's GDP"
- "Is more R & D alone the right answer?"

These queries warrant further, detailed study. Only some of these issues are addressed below.  
**Does New Zealand produce an adequate number of engineers?**

No matter which way the international comparative figures are studied the answer is an emphatic "No". New Zealand only produces half the number of engineers compared with countries such as the UK or Canada and less than a quarter the number of engineers when compared with countries such as Germany, France, Finland, Japan, etc. (See Chart 2 below)

### Science, Maths & Engineering Degrees as a percentage of Total University degrees



Ref: Education at a Glance - OECD Indicators - LB 2846.E247 - 1992

CHART 2

For New Zealand to even begin to become a "knowledge-based society" it will need to quickly double, and then slowly treble, the number of professional engineers and engineering technologists it currently produces. On top of that there will then need to be better incentives for them to stay in the country, or at the very least New Zealand's immigration of these skills needs will need to be set at a level that matches emigration of these technical skills.

***Education, Finance, and Marketing are all critical to the success of any strategy for growing the wealth of New Zealand.***

***The government has a crucial role in the first factor - encouraging and providing investment in the nation's brainpower.***

**The Intellectual Capital**

***Both the government and the private sector have equally important roles in providing and sustaining an investment-friendly environment that encourages innovation and a culture that feels comfortable rewarding success and accepting failure from time to time.***

**The Venture Capital.**

***The private sector has a vital role in the last factor - promoting and selling Technology as well as New Zealand as a provider of quality ideas, products and solutions.***

**The Marketing Role.**



## Historical factors - Economic

For most of the last century New Zealand's wealth was derived from the exportation of basic agricultural commodities. Essentially this country was a big farm in the South Pacific that provided the United Kingdom with "out of season" agricultural commodities. Despite the incredible distance from the market, the prices received for the produce were good, even after allowing for the shipping costs. New Zealand's benign climate and the years of hard, and often smart, work put in by the rural sector made this country relatively wealthy.

This situation led New Zealand into a very false sense of security and a 'cradle-to-grave' welfare mentality that many inhabitants thought could be sustained indefinitely.

These "golden days" started to come to an end in the late nineteen sixties when "Mother England" told "Child New Zealand" she was about to join the Common Market in Europe and that many of the special access rights exports from this country had enjoyed into their markets would soon be terminated. New Zealand suddenly had no option but to try and rapidly diversify its markets for dairy, meat, and wool products away from the United Kingdom into an often harsh, competitive world that tended to place large tariffs and other trade barriers on agricultural goods.

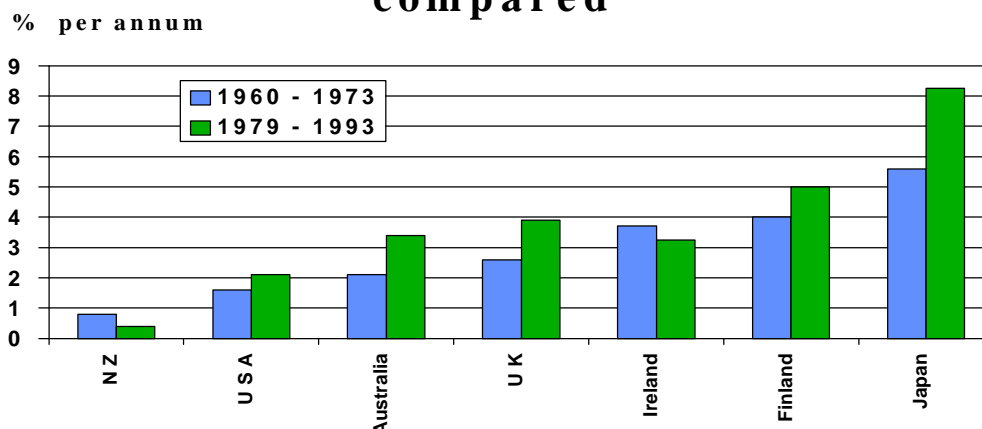
If that had been the only problem facing the country then given time it might have been solved successfully. Sadly it wasn't. Just a few years later in the nineteen seventies New Zealand had to also suddenly adjust to two huge price rises for an imported commodity upon which the country relied heavily, oil.

With the benefit of hindsight some of the strategies the country hastily adopted in reaction to all these pressures were not well analysed and not necessarily the smartest solutions. Despite that chequered history, New Zealand is now somewhat less reliant on imported energy and is a somewhat more diversified exporter than before. There is an improved spread of risk in both the product range exported as well as the number and type of countries or markets supplied.

Unfortunately, unlike some other countries facing similar problems, the responses New Zealand implemented in the face of these external threats have been sporadic and inconsistent from one term and breed of government to the next. While New Zealand was able to avert a total collapse of the economy it failed to stem a steady decline in relative wealth.

Productivity growth is one of the best international comparative measures and over the last three decades New Zealand's performance in this area has been abysmal. (See Chart 3 below)

## New Zealand's productivity growth compared



Ref: OECD Economies at a glance - 1996

CHART 3

Although these productivity figures have improved markedly since 1993 it will be a long time before New Zealand's 14-year averages even approach those of the other countries shown in Chart 3 above. More than any other type of historical measure this graph shows up the reasons behind New Zealand's "wealth-gap problem."

### Historical factors - Research

In the past nearly all of the New Zealand Government's considerable expenditure on Research and Development programmes was aimed at improving the performance of those industries based on the pastoral sector. Most of the large government research centres operated by the then Department of Scientific & Industrial Research (DSIR) and the Ministry of Agriculture (and latterly - Fisheries MAF), employed many hundreds of scientists focussed on the problems and needs of the country's agricultural base. The logic was understandable. Farmers, and their produce, provided the economic backbone of the country. Agricultural products were the base from which nearly all of New Zealand's export wealth was created.

The whole agricultural sector was a large part of the country's total economy and thus had incredible lobbying power. Politically motivated farmers saw positions on the various Producer Boards, and within Farmer Organisations such as Federated Farmers, as natural stepping-stones into local as well as national politics. These people then lobbied strongly to ensure that most of New Zealand's expenditure on Research and Development was aimed at the rural base of the economy.

Over the years New Zealand produced a large number of world class scientists and engineers who developed solutions to the problems faced by the farmers in the "powerhouse" that produced the country's wealth. The research arm was in close touch, not only with the production arm of the enterprise through MAF field officers but also with the very real needs of the marketplace. The feedback links were well established.

### Historical factors - Engineering Profession

Until some fifteen years ago most of the professional engineers in this country worked for one form or other of the government. Over 80% of New Zealand's graduates from the, then, two Engineering Schools

took up roles with the Ministry of Works, the Electricity Department, the Post Office, Broadcasting, Railways, Crown Research Establishments, Universities, Local Bodies, etc.

Those engineers who worked in the private sector were far outnumbered by those who were paid from the public purse. New Zealand engineers were busy for nearly a century building the roads, railways, bridges, ports, airports, dams, schools, hospitals, jails, etc. their young, undeveloped country needed. These engineers also provided the systems to reticulate the water, gas, sewerage, storm-water, electricity, telephones, radio and TV, etc. In other words creating and installing all the necessary infrastructure to make New Zealand into a modern and prosperous western country.

Rapid changes since 1985 have seen the privatisation of nearly all the main engineer-employing government departments and organisations. By 1998 more than 95% of the professional engineers employed in this country worked for the private sector, (or themselves), and virtually 100% of the graduates from the, now, five Tertiary Institutions now granting recognised engineering degrees, take up roles in the private sector.

# Historical factors - Banking and Finance

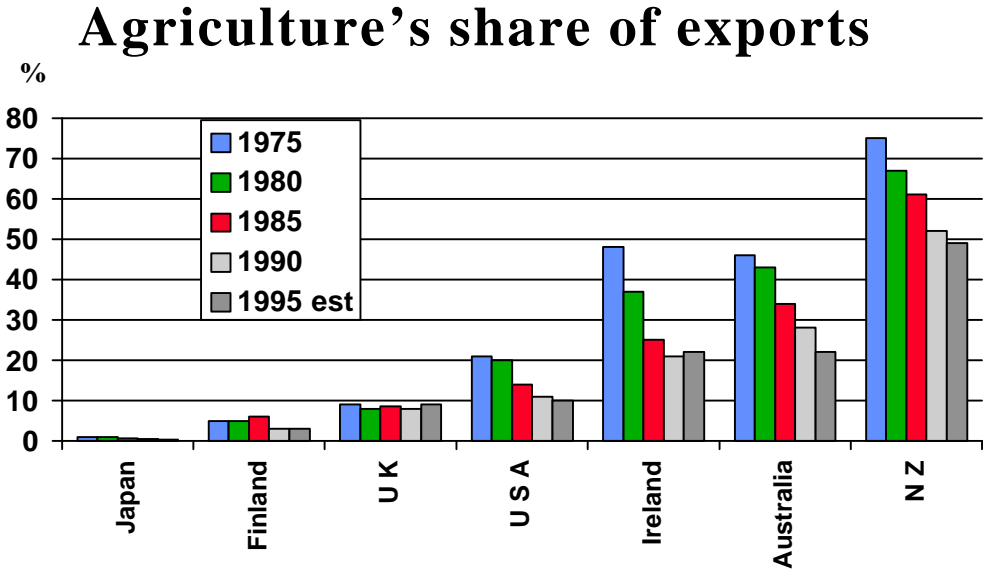
To round out the equation all the major New Zealand banks had developed a comprehensive understanding of the whole agricultural industry from farm gate to plate. All good New Zealand bankers generally knew how to provide advice to, lend money to, and invest wisely in, the sector. They provided loans to companies for Research and seed capital for investments and new ventures.

More recently banking and finance companies have begun to go through their own structural upheavals as they try to adjust to the rapid globalisation of their industry. Fierce competition and rapid technological change is also uppermost in the minds of the owners and managers in this sector. Bankers tend not to jump at the whim of government any longer and have reduced their exposure to the primary sector quite markedly in the last decade.

## Where to next?

For the next century, and beyond, virtually all the increases in New Zealand's wealth will come from the exportation of innovative, new products and services. Some of these ideas will inevitably be based on products from our agricultural base but increasingly the goods and services this country must offer the rest of the world in trade will need to be "knowledge intensive" and thus based on highly educated people.

This trend is already well underway as recent New Zealand export statistics bear out but it is also painfully obvious that some other countries are well ahead of New Zealand in implementing similar strategies. (See Chart 4 below):



Ref: OECD Economies at a glance - 1996 CHART 4

There is little doubt that the agricultural sector will under-pin New Zealand's wealth for many years to come but even here technology has played, and will continue to play, an increasing and vital part in keeping the various players viable and profitable. All New Zealand's major primary export sectors are under constant threat from competitively priced, technologically driven and well-marketed products.

For instance:

- The Dairy sector is now being hit with competition from genetically modified Soya Bean milk products and new forms of margarine made from natural oils. Health concerns mean that future research activities will need to focus on the positive aspects of naturally produced dairy products.
- Beef and Lamb meat producers, often on family-owned farms, are having to compete with ever lower-cost, factory-produced, chicken, pork and turkey meal solutions. Health concerns abound here also and provide New Zealand with some very real marketing advantages.
- Ever-smarter and cheaper synthetics, let alone changes in fashion and living styles, continue to threaten wool carpets and woollen clothing.
- Timber producers, especially those that grow trees only for pulp, are faced with new plantings of very fast growing, 'genetically engineered' trees from both North and South America.

Investment in new technologies is driving most of this competition at alarming rates of development. New Zealand must also run hard and fast just to maintain their current position around the globe.

In this very different and “New World”, New Zealanders must quickly learn to accept that **Knowledge is Power** and control of knowledge is a very powerful tool that leads to wealth.

All around the world there is an ever increasing danger of knowledge becoming “proprietary” and thus being captured by a few countries, a few companies, or even a few individuals. Only excellent, locally owned R & D can combat that threat. Successive governments have said they are "not into picking winners" and yet New Zealand cannot be a leader in more than a few chosen fields. When funding R & D the government has to pick winners.

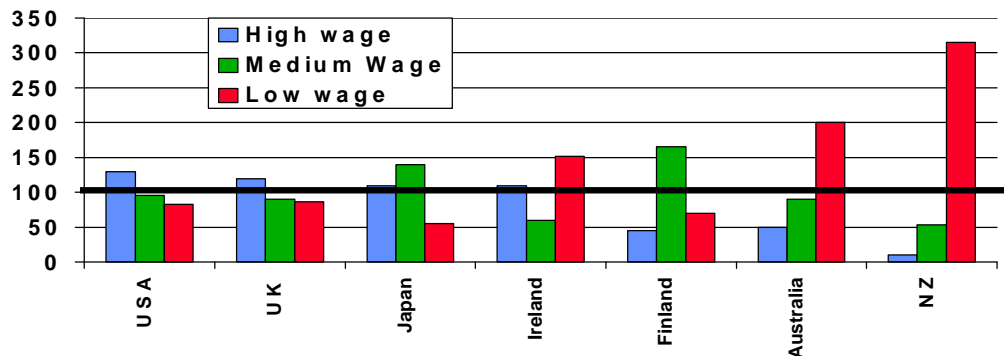
Most analysts accept that while there is a need to continue to keep New Zealand's rural sector efficient and effective with appropriate Research and Development programmes, this is not where the country's medium to long-term future lies. Within the foreseeable future Eastern Europe and parts of what was once Russia will most likely become integrated into the rest of Europe. These countries have a huge potential to produce low cost food for Europe and other parts of the world as well. Similarly North America is investing heavily in farming and agriculture processing capacity in Central and Southern America. New Zealand currently relies heavily on these markets and will increasingly need to find new 'niche areas' for their particular farming circumstances and expertise, closer to home in Asia.

Creating employment by setting up protected companies to manufacture relatively simple products, often under licence, with low or medium skilled workers, as New Zealand has tended to do in the recent past, offered no real wealth solution to the country either.

New Zealand needs to create more highly paid jobs in skilled areas just as Finland and Ireland have done. (See Chart 5 below)

## Wage and skill differentials in manufacturing

OECD = 100



Ref: OECD Economies at a glance - 1996

CHART 5

While Research and Development remains as vital as it ever did, this country now needs more of a new breed of scientist. As New Zealand's R&D effort moves away from the rural sector the required skill sets and all the necessary support mechanisms are becoming quite different. The "Industrial Research Scientist" has different training needs and different types of expertise from his/her agricultural counterpart. These people must often work within a marketplace where the feedback, for reasons of competitive advantage, can be very secretive, or at the very least, commercially sensitive.

The "wealth creator" is no longer a farmer. In this new industrial and technological world wealth is more likely to be created by a Technologist, an Engineer, an Entrepreneur, or an Investor. Scientists who understand engineering processes and get on well with engineers, technologists, and entrepreneurs are trained very differently from scientists who understand farming and agricultural production. R & D establishments will need to employ more engineers and technologists to bridge the gap from the Research to the Development. Transferring a developed product into production and then the marketplace is a very complex and uncertain process requiring many different professional skills.

The banker or financier also needs to be able to draw on engineering and technological skills to be able to analyse investment proposals on their own merit. To be able to lend money, or invest capital, on just an "idea" rather than on "assets" such as land, buildings, plant, equipment, or animals (where independent valuations can be found to help in risk assessment) is a very rare skill at the moment. Venture Capital firms in North America employ more technologists than financiers for very good reasons.

## What New Zealand needs to ask of its Education Sector

As a basic premise it is now widely accepted in education circles that New Zealand must begin producing more technologically literate people. At some levels the syllabus is in place, it is the delivery mechanisms that need to be worked on.

### Technology Curriculum - Working well

In recent years this country has made some excellent advances in Primary education with the introduction of the new Technology Curriculum. This is arming the next generation of young kiwis with a much better sense of balance as to how things work the way they do and why. The Institution of Professional Engineers New Zealand (IPENZ) has been working closely with the New Zealand Royal Society (NZRS)

and is providing project materials and manpower to assist schools and individual teachers in promoting the excitement and importance of this relatively new subject area to children.

This raising of the “technological awareness” of the next generation is vital to the future of New Zealand if the country is to become part of the world's new "knowledge economy". Many of the programmes that have been implemented are world firsts and the results to date are very encouraging.

Children between the ages of five and seven learn at a prodigious rate. This is the age where children learn how to learn and the age where the interest and excitement of the technological world they are about to enter can best be instilled. It is interesting to note that the French have been aware of this for centuries and their education system places their best teachers with these younger children and also rewards them with the highest salaries.

### **Teachers with good Technical skills - A critical resource**

At the Secondary school level the problems of maintaining this raised technological awareness are beginning to appear. Although both students and their parents seem to remain convinced of the importance of science and maths, (evidenced by the numbers still undertaking the subjects \*), most schools struggle to attract, or even hold onto, enough of those teachers with good scientific, mathematical or technological qualifications..

For a variety of reasons people with good technical qualifications prefer not to teach but instead use their skills elsewhere in the workforce. When questioned about their career decisions one of the main factors these ex-teachers or non-teachers talk about is money. Generally a scientist, a technologist or an engineer can earn between \$10,000 and \$30,000 more per annum simply by moving from the classroom into industry. As they move out other teachers, who often do not have such a good scientific training or background, pick up their students and their subjects. Doubtless these teachers try their hardest but the role models they provide for the next generation are not those that a student, who might be considering a technological career, needs at that impressionable age.

While there are still some teachers with good, relevant qualifications and experience who struggle on against the odds they are becoming rarer each year. The Universities take the output from these secondary schools and many of them are convinced, from their own entrance tests, both mathematical and science standards have been dropping steadily for more than a decade. On top of this far too many students are leaving the school system early and are then ill equipped to meet the demands society will soon put on them.

Until the secondary schools can address this critical issue of skill shortage and begin to pay the going rates for different qualification and skill sets, New Zealand is destined to continue down the path of mediocrity in its technological endeavours. The teacher unions must somehow be forced to confront and deal with this situation for the future good of the country. If qualified Science and Mathematics teachers have to be paid more than their counterparts teaching English, French or History then so be it. Virtually every other section of the country's workforce, either government or private sector based, has had to adjust to this market-driven concept a long time ago.

\* [The New Zealand Qualifications Authority reports that in 1996 the top seven subjects being taken for University Bursary by Entrance Candidates were: English, Maths with Statistics, Biology, Maths with Calculus, Geography, Chemistry, and Physics]

## Educating the Engineering Profession

At the tertiary educational level the number of providers of engineering qualifications continues to expand. There are now five universities providing four-year Bachelor of Engineering (or equivalent), degree courses. There are also a number of tertiary education institutions providing, or looking at providing, a range of three-year Bachelor of Engineering Technology degree courses. All of which looks promising at first glance.

Unfortunately when the statistics are analysed carefully it becomes apparent that the actual output of graduate engineers who intend staying and working in New Zealand has been steadily falling for at least the last decade. (See Charts 6 & 7 below)

## New Zealand Tertiary Graduate Output

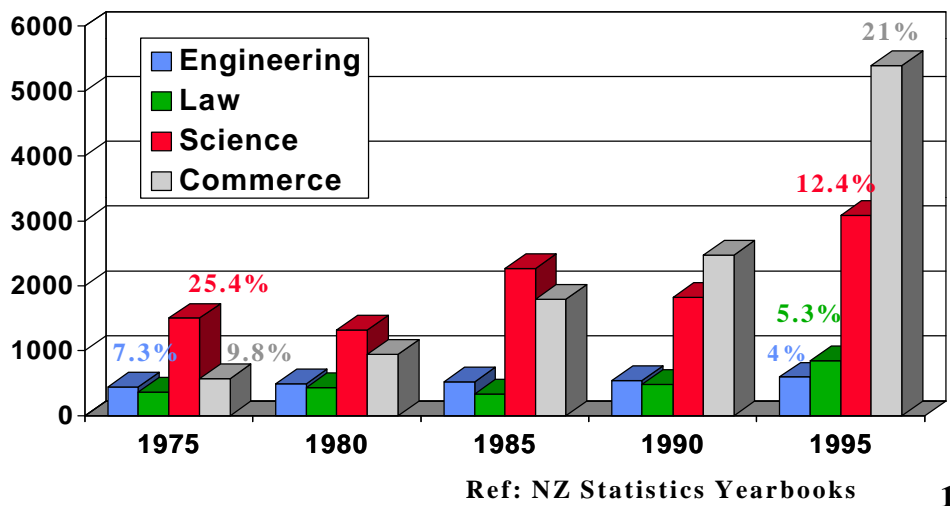


Chart 6

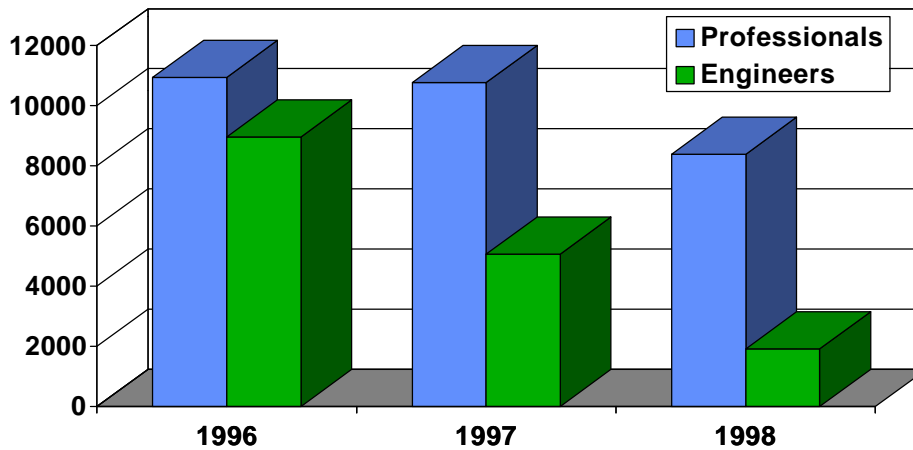
Although the total number of graduate engineers has increased a little over the last 20 years this number is made up of a growing quantity of overseas students with no intention of staying in New Zealand. On top of this the number of “locals” who graduate and then leave the country soon after also seems to be increasing. For a few years in the early 1990’s this out-going tide was offset by the number of migrants who had Professional Engineering or Engineering Technologist qualifications and who came to settle in New Zealand. Even that helpful inflow of talent has been discouraged by the recent anti-migrant sentiments espoused by one political party.

There are a number of industries, particularly in the electronic sector, who are unable to expand their production because of the lack of available technical and engineering skills. Engineering salaries have been rising two or three times faster than the rate of inflation as a result.

The number of graduates of law courses has nearly doubled over the same period. Sadly less than half of these graduates will ever work as solicitors in their chosen profession. The number of scientists graduating has also doubled to the point where over 3,000 now leave the University system every year. At the last count there were only 2,850 scientists actively involved with research in New Zealand. The rest obviously end up in all manner of other roles, teaching being a prime one. Over the last 20 years the number of graduates with a commerce (accounting, business or management) qualification has risen by a

staggering 750%. This is hardly the way for New Zealand to prepare the next generation for the "knowledge economy" everyone says is almost upon us.

## NZ Immigration Statistics



Ref: Immigration Dept

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CHART 7

### Student Loans - a real disincentive to stay in New Zealand

This growing shortage of engineers and technologists is an almost world-wide phenomenon. Only Japan and Northern Continental Europe seem to have addressed the situation and yet even then employers in these countries still complain about a lack of availability of enough people with good technical skills in certain areas. The salaries, wages, and contract fees for those with the sought-after skills are rising rapidly.

To a young New Zealand graduate, faced with large student loan debt repayments, the possibility of overseas travel and an interesting position with a much larger salary looks very attractive. If the position is in Australia then there is a reasonable chance that the emigrant may well settle there and be lost to this country for good. Those who go further afield do tend to come 'home' after a few years - especially once they begin to raise a family.

This issue of the burden of the New Zealand Student Loan Scheme needs to be addressed. Changes have already been made to the scheme to stop the process almost throwing money at students. Too many of them used the "easy money" very unwisely. Accepting that there is still a reasonable case to be made for making selected first, or undergraduate degrees, much less costly. Post-graduate Masters or Doctorate degrees could be charged at a higher rate. Those people wanting to do these second degrees are more likely to be able to raise some sponsorship and/or work part time.

Some companies are already offering to pay part, or all, of the student's loan off over a period of years as part of the employee's remuneration package provided they stay with the company for an agreed period. This is not unlike the system of "bonding" that took place thirty to forty years ago when the writer was an engineering student and his class mates had an "advance" from their future employers.

Industry is not generally looking for people who have spent more than four or five years at university and they rarely pay higher salaries for higher qualifications. It tends to be only research laboratories, consultancies and universities themselves that value this extra education. Even then they do not "value" Masters or PhD's in monetary terms. Industry wants to get hold of the young graduate as soon as possible and then give them more training in what they consider is "the real world".

In the view of many business people, Post-graduate studies are better taken up a little later in life when the individual has a much better focus on their future career plans and needs.

Increasingly people are realising that a degree or diploma is no longer a ticket to a guaranteed job for life. In growing numbers they realise the need to go back to "school" for more training and refresher courses from time to time. The tertiary sector has been slow in setting up to tap into this market but recently there have been good advances and most professional bodies are also encouraging their members to undertake more "Continuing Professional Development". Professionals in all walks of life are being urged to "keep up to date" and maintain their future "employability" by their respective professional bodies.

## The Finance Sector

While the education sector is having its problems addressing the new technological needs of the country so too are New Zealand's banks and financial institutions. Like their counterparts around most of the developed and developing world they are very conservative in their lending and investment criteria. New Zealand's banks are now nearly all offshore owned - mainly from Australia - and follow the English rather than the American "risk model" when lending on business ventures. In other words they look for security in the **assets** of the entrepreneur rather than lending or investing in a new project on the strength of the **idea** itself.

While the smaller countries of Europe, such as Ireland and Finland, might give the New Zealand Government some good ideas to model this country's education systems on, it is the USA, and particularly California, that should be the model for any new Venture Capital systems this country might try and adopt. Somehow the New Zealand Government needs to find ways that make it easier for Investors to take risks and yet not be totally discouraged if they fail. They do not need to get directly involved but they do need to create the right type of environment. There are well-accepted models around the world for taxation systems that encourage investors to assist entrepreneurs without necessarily involving the taxpayer in the loop.

There are some who say that there is not a shortage of venture capital just a shortage of good managers with all the skills necessary to take an idea from conception through to the marketplace. There is a role for educationalists in teaching entrepreneurship but the lecturers would be very hard to find.

## Marketing

Engineers are notoriously bad at selling themselves or their ideas even to each other let alone the rest of the community. New Zealand is not alone in having to face up to this issue. If the nation is to succeed in the "global village" by selling ideas to the rest of the world then marketing and salesmanship are going to need to be high on the educational and training agendas of most organisations. Selling technology and technological ideas and solutions needs specialised technical sales expertise.

Selling the benefits of technology to the rest of New Zealand and selling the ability of knowledge to raise the standard of living for the whole community is undoubtedly the first task. Not enough people realise the future impact of what is happening all around them and politicians have only recently woken up to the critical position New Zealand is now in.

The choices are becoming more stark and that is helping to make them more obvious.

## Conclusions

- The past is not going to be any guide to the future for New Zealand. The base upon which wealth creation must be built will be “knowledge intensive” therefore **EDUCATION IS CRITICAL**
- New Zealand is much further down the transitional road from just a big UK farm to a “knowledge-based” society than most people realise and many elements of the “new economy” are already in place but there are some critical gaps in the systems that encourage the growth of both **INTELLECTUAL CAPITAL and VENTURE CAPITAL**
- Secondary schools and their teacher union must be brought into the equation quickly. Good teaching of science and maths subjects by people who can provide excellent **ROLE MODELS** is critical to New Zealand’s future survival let alone success. Differential salaries are necessary
- New Zealand needs more technically capable people at all levels of activity. **Not more Scientists**, but rather a different type of Scientist for the non-agricultural sector, more Professional Engineers, and many more Engineering Technologists and Technicians
- New Zealand must stop “investing in the past” and spending valuable R & D effort (time and money) on commodity-based agricultural products and low tech manufacturing activities. Far too much government-funded research is driven by production "push" instead of market "pull" or need. Much of this work results in products that are not commercially viable. Future exporting activities must be based on selling this country's **BRAINS not BRAWN**
- The Finance Sector must be encouraged to rapidly increase their technological skills to better operate in this “new world” where both investment and risk assessment decisions must be made on **ideas** not **assets**
- New Zealand needs to market itself to the rest of the world in a number of new ways. The whole country needs to be seen as lively, bright, well educated, innovative, flexible, and hard-working. New Zealand needs to be perceived as an honest and straight forward place to do business in as well as an excellent place to live
- The rest of the world is not waiting for New Zealand. While they might not need us we certainly need them
- Time is running out. The country must finish the job of restructuring the economy especially in both the education and finance areas in preparation for the next one hundred years and beyond

*The coach, having made sure the whole team has all the right gear, having told them of all the new rules and the way the game is now played, having built up their confidence and exhorted them into a winning frame of mind, must then stand back and let them get on with it.*

**Warwick T Bishop**  
**CEO - IPENZ**

Wellington

