

INQUIRY INTO BUSINESS COMMITMENT TO RESEARCH AND DEVELOPMENT IN AUSTRALIA

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1. Background

Wildlife Management International (WMI) is a small, Darwin-based Australian company (since 1978) with 20 employees. Around half the staff are involved at varying levels in either providing research, management and education services (to large and small clients, private and Government, within and outside Australia) and/or conducting in-house R&D with various goals.

WMI are involved in a series of partnerships with other national and international research organisations, and WMI staff serve on various committees that deal with research. We also provide advisory services to a number of overseas Governments. WMI are strong investors in R&D themselves and are familiar with the risks of small business investing in R&D - especially in remote parts of Australia.

WMI strongly support the notion that there are many benefits to be gained by developing a stronger "culture of research" in Australia. However, when trying to assess the problem of "why" Australian companies do not invest more in research we believe great effort is needed to define the problem accurately. In our opinion, the research community - including ourselves - must share a much greater part of the blame than normally appears to be the case.

Time constraints prevent a detailed submission but we take the opportunity here to list some issues and concerns germane to the terms of reference, which we hope can assist. Our submission concerns mainly the issue of R&D drivers in small to medium-sized businesses rather than the needs of fast-growing companies, or the considerations international corporations make in determining the site for R&D investment.

2. What is R&D

To understand investment in R&D, or the lack of it, it is important to get a clear view of what R&D is. In our opinion (which may not be shared by many other researchers) it is fundamentally linked to "solving problems". Any R&D exercise starts with a primary problem, which in its broadest sense may be rectification of a constraint within current activities or the lack of some key tool or piece of innovation for which a market may exist (opportunity).

There are thus three critical stages:

1. *Problem identification* the potential stimulus for R&D
2. *Research* the process undertaken to investigate the primary problem and potential solutions (which may involve chains of secondary and tertiary problems)
3. *Development* the result - ideally the solution to the primary problem, plus "spin-offs" in terms of new knowledge and experience.

3. Economic Constraints

If this simple model has any validity, the main economic drivers and constraints on R&D in business, especially in small business, seem reasonably straightforward:

1. What is the economic significance (or potential) of the problem?
2. What is estimated cost of researching it and deriving a solution?
3. What are the economic benefits that can realistically be expected to be derived from developing a solution?
4. What are the risks of the effort being an economic failure?

As in any "problem-solving", past experience and confidence in any other players likely to be involved play a major role in determining whether business invests in R&D or not.

4. Interpreting Trends in R&D within Small Business

Much has been made of the reluctance of Australian businesses to invest in R&D. It is almost always portrayed by research providers as indicating some form of ignorance or incapacity on the part of the average Australian business. If this were so - and we doubt it greatly - the solution would seem to lie in education, training, assistance and encouragement.

But an equally compelling argument is that the willingness to invest in R&D is directly linked to past experience with R&D. One may well pose the question: if the economic and social benefits Australian businesses derived from research were large, real and obvious, would there be any need to have this inquiry? Business would be knocking the door down to invest in R&D.

Logic suggests businesses would invest in R&D when:

1. There is a history of *good experience* with the use of R&D as an economically viable problem-solving tool;
2. There is confidence in the research community and other stakeholders; and,
3. The ability to reap the rewards of R&D in the past has not been unduly constrained and hampered by the Australian "context".

The reverse situation is perhaps more germane. Small businesses are unlikely to invest in R&D when:

4. There is a history of *bad experience* with the use of R&D as an economically viable problem-solving tool;
5. The other stakeholders on whom the R&D depended were unreliable or incapable of delivering the needed outcomes; and,
6. The ability to reap the rewards of R&D was constrained by other aspects of the Australian "context".

When seen from this perspective, the failure of many small businesses in Australia to invest in R&D - if this is indeed the case - may indicate the application of sound business principles within a fragile, small business context, and caution built on experience about diverting from core business to chase rainbows.

If this is the case, then education may not be the problem, and a much more comprehensive understanding of the constraints and real economic "risks" will be needed. This inquiry is clearly a major starting point.

5. Confidence in Research and Researchers

It is not altogether clear whether small business has or has not a great deal of confidence in researchers and the research community as a whole.

If we take agriculture as an example, which clearly involves many small businesses in the country, and often involves farmers and graziers paying levies on their produce to fund the research, how much confidence do they have in the people and process? Do they have the same level of confidence they place in the local doctor, dentist or lawyer to solve their medical, dental or legal problems? I suspect not.

For example:

1. In the 1970s there was a boom in the "agricultural consultancy business", where University trained specialists were engaged by consortiums of farmers and graziers to help solve their problems. If this had been generally successful, and led to increased profits, then the trend would have continued.
2. Despite wonderful progress in many fields of agricultural research, does the average stakeholder feel the research effort is well directed at the main problems they are facing?
3. How often are real audits carried out on research expenditure on behalf of landowners versus real economic benefits obtained?
4. In one field of study with which we are familiar, millions of dollars have been invested in research within two separate Government institutions, all justified on the basis of "benefits to farmers". Yet we cannot point to one tangible benefit, in real terms, that has altered profitability in any way.

5. When one sees major past research expenditure on "automatic mechanical shearing machines", yet shearing is still done by hand, do landowners still have confidence in the system.
6. In the middle of a wheat growing area with which we are familiar, a great deal of the research effort over time was devoted to novel new subjects someone deemed had potential, rather than to improving the core business upon which the farmers relied for income?

This is not to say that there have not been wonderful benefits from agricultural research, nor that there is not a legitimate and valuable role for exploring new areas that may be intellectually challenging for the researchers. But has the balance been right? And perhaps most important, do farmers perceive the researchers and research community to be the highly skilled "problem-solvers" in whom they are prepared to invest.

6. Serendipity

We are often encouraged to invest in R&D by examples or case histories that to some degree are serendipitous. One must question whether highlighting successes and ignoring failures is any more compelling to the average small business than case histories about people who hit the \$60,000 jackpot on a poker machine.

7. The Link between R&D Expenditure and GNP

"Correlation" and "cause and effect" are infamously difficult to separate, and thus when simple correlations between expenditure on private sector R&D and GNP between different countries exist, it does not necessarily mean that if the private sector in Australia invests more in R&D, that the economic wealth will automatically increase. The Australian "context" may provide serious constraints no matter how much money is invested. That Australia is currently trying to sort out national priorities for research is an extremely important initiative in this direction. I suspect there will be a string of potential research directions on a global scale that would be difficult to pursue in Australia.

8. The Australian Context

We are clearly a very large country with a small population - a resource base like a developing country but the quality of life of a developed country. We are isolated, without common borders, tend to speak a single language, have remarkable cultural divides with our nearest neighbours and major potential markets. Our physical isolation and inability to easily tap into a variety of highly skilled support services, such as are readily available to researchers in Europe, North America, Japan, Korea, etc., is a major impediment to the ease with which certain forms of research can be done here. Our distance from viable markets is a serious impediment to our ability to readily market the results of successful R&D. We tend to have a "layback" style, and perhaps do not pursue 100% reliability in service to anywhere near the level seen in countries such as Japan. Throughout much of Australia there is limited competition in services.

And the tyranny of distance. As a research-based company working from Darwin, and often in other countries with different languages, personal meetings are important. The last four meetings we've had in Asia have involved flying from Darwin to Sydney or Perth, in order to get a connecting flight back to Singapore and hence to our destinations in Asia. The cost of such logistical isolation is horrendous relative to competitors.

And in the field of "biology", the ability of anyone in the private sector to export and import biological samples is unbelievably difficult relative to Government institutions - it can take months. Indeed, the legal system often curtails the ability of private researchers to even be involved! How can we compete with researchers in the USA or Europe?

When it comes to new commercial opportunities, we are often severely constrained. For example, major new emerging markets like China give every indication that they would rather import freshwater turtles than sheep. We have the research ability to produce turtles sustainably, but are constrained from doing so by entrenched attitudes that "people should eat sheep".

9. Competitive Neutrality

In very few areas that I can think of are the principles of competitive neutrality more abused than in the area of research services. Taxpayers money is used continually to favor research in the Government sector, over than in the private sector. It is now common practice to fund post-graduate students in various CRC's and Key Centres to get "cheap" answers to research problems, without worrying too much about the quality of the answer.

Do we want to have a nation with a strong research capability in the private sector? Is this an important element of promoting research in Australia and absorbing graduates. Or do we stifle the private sector in order to build bigger and bigger Government research institutions? How can any small business compete with Government in research in Australia?

WMI argue that Government research institutions should push as much research as possible into the private sector, to encourage strong growth, while retaining research into areas that only Government can afford to pursue. But the opposite is the case and it has become much worse since organisations like CSIRO are expected to meet external earning targets. Government research institutions guard cautiously any research that they can be funded to do, and they are not beyond striving deliberately to stifle research in the private sector.

There appears to be an expectation that researchers in the private sector attempting to use Government research capabilities will need to pay, according to some scale that may reflect years of service rather than problem-solving skills. Yet there is an expectation by Government that the private sector will assist them gratis. An expectation that you will pay \$1000 per day for someone to identify ants, but if there's a new species amongst the ants, that the institution can have it gratis.

10. Conclusions:

1. Benefits from increased investment

On the basis of the insights above, we doubt whether "greater private sector investment in R&D" *per se* is the important issue. The private sector will invest more heavily in R&D if the risks of financial failure are reduced. Given the constraints on pursuing research in Australia relative to Europe or the USA, we suspect this means much higher levels of taxation incentives and much higher levels of real assistance *to the private sector* than are provided to our international competitors by their respective Governments.

2. Impediments to investment in R&D

The risks of failure are too high in Australia to pursue many forms of R&D on an internationally competitive basis, and there is no culture of Government fostering and valuing private sector research because it is often in direct competition with them.

3. Steps to better demonstrate the benefits of higher private sector R&D investment

Step 1. Pick ten major spheres of economic activity where R&D has a proven capacity to generate wealth here or overseas, and commission ten detailed studies of what specialists in those areas, in the private sector, in Australia, consider the major constraints to be.

Step 2. Implement on an adaptive trial basis some major initiatives to overcome those constraints in at least some of the spheres, and monitor objectively the response of the private sector in terms of R&D investment and outcomes. As problems are identified, adapt the situation accordingly.

4. Sites of R&D investment

We suspect that relatively few companies would site major R&D efforts in Australia unless there were substantial savings in terms of the costs of R&D, which may be favored by the low value of our dollar, the constraints of the Australian context not impacting significantly on the type of R&D, or the R&D was based on a resource or environment that was not available elsewhere.