Australian Agricultural Sector Productivity & Natural Resource Management

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1. Introduction

In developing some thoughts for this paper I was particularly taken by some comments made by Professor Ross Garnaut in a recent address to Australian Treasury officials when he said that the Australian public had come to expect “too much prosperity too easily” and that the country’s political culture had become too timid to make tough reforms. He went on to say that Australia’s productivity growth had fallen from being among the best in the world a decade ago to being amongst the worst currently. He also bemoaned the fact that after 20 years of significant economic reform “we have restored the old political culture which had guided our chronic underperformance through the first eight decades of our federation”.

There are also some potentially dark clouds gathering for the Australian agricultural sector which after three decades of strong productivity growth is now confronted by a productivity slowdown which may not offset the impact of a continuing decline in the farm terms of trade.

This paper explores the productivity slowdown, the reasons for it and the possible impacts on natural resource management investment by the farm sector and other NRM investment entities. It also investigates a number of other farm business financial ratios that could impact further on the future resilience of the sector.

2. Productivity & Profitability Trends in Australian Agriculture

At the outset it is important to note that there is a very strong linkage between productivity trends and agricultural sector profitability.

Productivity growth over the last 30 years has broadly offset the continuing decline in the farm terms of trade (Figure 1).

*Figure 1: Australian Agriculture Productivity Growth and Terms of Trade – Broadacre Industries*

![Graph showing productivity growth and terms of trade](source: ABARE, Nossal & Sheng, 2009)
This productivity growth has been achieved via almost equal contributions from output growth and reduced inputs (Figure 2).

**Figure 2: Australian Broadacre Industry Productivity Growth – Movements in Outputs & Inputs**

[Graph showing productivity growth indices from 1977-78 to 2007-08 with labels for Total factor productivity, Total Outputs, and Total Inputs indicating growth rates of 1.4%, 0.8%, and -0.6% respectively.]

*Source: ABARE, Nossal & Sheng, 2009*

Importantly, this productivity growth has not been equally distributed across individual agricultural industry groups and within these groups (Table 1).

**Table 1: Australian Agricultural Productivity Growth by Industry – Average Annual Growth (1977-78 to 2007-08)**

<table>
<thead>
<tr>
<th>Industry</th>
<th>TFP Growth</th>
<th>Output Growth</th>
<th>Input Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total broadacre</td>
<td>1.4%</td>
<td>0.8%</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Cropping</td>
<td>1.9%</td>
<td>2.1%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Mixed crop-Livestock</td>
<td>1.4%</td>
<td>-0.1%</td>
<td>-1.6%</td>
</tr>
<tr>
<td>Beef</td>
<td>1.5%</td>
<td>1.6%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Sheep</td>
<td>0.3%</td>
<td>-1.5%</td>
<td>-1.7%</td>
</tr>
</tbody>
</table>

*Source: ABARE*

Productivity growth has been restricted to larger farms and especially those top quartile farms based on profitability (Figure 3).
Figure 3: Australian Broadacre Industry Productivity Growth by Farm Size*

* The split of broadacre farms among the three groups is based on the estimated 33.3 and 66.6 percentiles of carrying capacity (dse’s) in each year.

Source: ABARE

Significantly since most of the farm sectors productivity growth is developed by top quartile farming units – this vibrant and to this point very resilient group will be adversely impacted by any productivity slowdown.

Average profitability figures for the broadacre agricultural industries does not illustrate the growing “dualism” across the agricultural sector (Figure 1).

Figure 4: Financial Performance – All Australian Broadacre Industries

Source: ABARE Farm Surveys
However, any segmented analysis of the farm performance of the farm sector does indicate this “dualism”.

- 80% of broadacre farm businesses generated 48% of agricultural output and reduced aggregate industry profitability by approximately 49%.
- The remaining 20% generated 52% of output and virtually all of the profits.

*Source: Australasian Agribusiness Services, “Financial Performance of Broadacre Agriculture”*

### 3. More Recent Agricultural Sector Productivity and Profitability Trends

Productivity growth in the current decade is much weaker than during the previous two decades (Figure 5).

*Figure 5: Australian Broadacre Agriculture Productivity Growth is Slowing*

![Graph showing productivity growth](image)

*Source: ABARE, Nossal & Sheng, 2009*

This is occurring at a time when the adaptive capacity and resilience of the agricultural sector will be thoroughly tested by higher Australian Dollar cross rates (short term), and major government policy initiatives such as a reduction in the MDB water extraction cap (median term) and adjustments related to climate change (medium – long term).

Whilst drought impacts during the current decade especially across eastern Australia may have negatively impacted on productivity growth, this trend is also very strongly correlated with a slowdown in the growth of government research and development expenditure since 1980 (Figure 6).
Equally it could be argued that a decline in the condition of natural resources (land degradation, excessive water extraction, etc) over the past three decades has also had some negative impacts on productivity and profitability trends.

Importantly investment in research and development has a lagged impact on productivity with the positive benefits often continuing for periods well in excess of 10-15 years. This slowdown in investment growth could have longer term impacts on productivity growth. Public agricultural research and development expenditure as a percentage of the gross value of agricultural production has also fallen across the same period to a little over 3% (Figure 6).

*Figure 6: Growth in Australian Public Agricultural R&D Expenditure has slowed*

It is also interesting to note that the recent Australian experience in terms of slowing agricultural sector productivity growth is a world-wide phenomenon. In a recently published book entitled “Persistence Pays: US Agriculture Productivity Growth & the Benefits from Public R&D Spending” (Alston, Anderson, James & Pardey, 2009) the authors suggest that public policy makers across the globe may have started to take agricultural productivity growth for granted. They claim that worldwide growth in public agricultural investments has slowed and that given agricultural research takes time to generate benefits, public policy makers have become impatient in demanding more immediate outcomes. Notwithstanding this, the authors state that the estimated national internal rate of return to USDA research was 18%.

Another trend which has the potential to impact on agricultural sector profitability and adaptive capacity going forward is the recent acceleration in farm sector debt and reduced debt servicing capacity (Figure 7 & 8).
Figure 7: Australian Broadacre & Dairy Farms – Average Receipt & Debt Level Movements

![Figure 7: Australian Broadacre & Dairy Farms – Average Receipt & Debt Level Movements](image)

Source: ABARE Farm Surveys

Figure 8: Australian Broadacre & Dairy Farms – Debt Servicing Ratio*

![Figure 8: Australian Broadacre & Dairy Farms – Debt Servicing Ratio*](image)

* Percentage of Farm Cash Income expended on interest payments.

Source: ABARE Farm Surveys

Whilst farm business equity levels remain high (currently around 88%) increases in interest rates and any downward correction in land values following their recent upward surge is also cause for concern (Figure 9).
It is worth noting the apparent disconnect between slowing productivity growth and the surge in land values.

4. Natural Resource Management & Related Investment Activities

The development of the regional NRM investment model across Australia owes much to the fact that previous government involvement in NRM had a chequered history with some success and failures. Previous government funding mechanisms, whilst sizeable in monetary terms, had a tendency to be ad hoc and driven by the demands of small groups with no integrated approach to catchment wide planning with a resultant failure to achieve landscape change. Notwithstanding this, previous NRM funding did achieve very significant increase in knowledge of environmental and NRM issues, especially across farming communities and this has provided fertile ground for regional NRM investment programmes across Australia.

So in essence, governments almost fell into the regional NRM model given historic policy shortcomings. Perhaps there was a realisation that Albert Einstein was correct when he said “One cannot solve a problem with the same thinking that created it”.

The fact that many regional NRM bodies have in an embryonic sense successfully positioned themselves over a relatively short timeframe owes much to the diversity that is created by entities that are governed by boards and staffed by people who are actively engaged with regional/catchment communities.

A quick review of the Catchment Action Plans developed by the 13 NSW CMAs illustrates this diversity. Very clearly they have been developed taking into account the different demography, resource base, environmental issues and communities that are unique to individual catchments. This is a far cry from the highly centralised agency structures that existed in NSW prior to the formation of CMAs.
The NRM investment models developed by the CMAs are also diverse; ranging from very significant devolved grant activities at one end to more investment banking approaches at the other. This raises the inevitable question about which model is better. The answer of course is that each model can be successful provided it has considered the prevailing local conditions, environmental issues and community needs.

Clearly diversity will, I believe, be the key to success and regional NRM bodies and their communities need to guard against any gradual shift back to centralised structures which have been found wanting in the past. Notwithstanding this, the success/failure of regional NRM bodies can only be measured over the longer term.

5. Risks that Threaten NRM Investment Activities

Some considerable time has been spent in this paper exploring the slowdown in agricultural sector productivity growth, subsequent impacts on profitability and adverse debt/equity trends. Additionally, a number of public and private sector commentators have concluded that any factor that impacts negatively on farm sector productivity and profitability can lead to reduced focus on the maintenance of environmental assets.

It is critical if regional NRM investment entities wish to achieve triple bottom line outcomes (improved environmental outcomes, industry resilience and good socio-economic outcomes) that they understand the factors which impact on business profitability (both farm and non-farm) and the subsequent impacts on regional communities.

Given the farm sector trends noted previously in this paper, some of the investment models utilised by regional NRM bodies which seek to determine the public and private benefits (e.g. Environmental Benefits Index) in allocating public funding to projects may have more limited use if the farm sector investable surpluses available to match this funding become more restricted. This then raises a range of equity questions. For example, should regional NRM entities develop different investment models for the top and bottom farm sector quartiles and how should public funding be allocated between on-ground NRM investment activity and the more general NRM engagement activities? These are challenging questions for regional NRM bodies.

At the same time there is growing evidence that broader community demands for environmental outcomes and related regulations can impact on farm cost structures and subsequently can accelerate structural adjustment pressures.

5.1 NRM Funding Constraints

A substantial risk for regional NRM bodies is that having positioned themselves to investors of public funding and having raised the demand for their services is that future funding begins to dry up and/or does not meet expectations. Leaving aside the politics, state governments regardless of their financial creditability, are more financially constrained than the Australian Government given the latter has access to
virtually all the high growth tax revenues while the states are dependant on the lower
growth revenues. Thus when it comes to “matching” Australian Government funded
NRM programs, the states are relatively constrained. Thus it is particularly ironic that
since the cessation of the NHT/NAP funding rounds, the Australian Government
funding provided to regional NRM bodies has actually fallen while that of the states,
in particular in NSW, has increased.

5.2 Future Constraints on Public NRM Funding

Going forward there are some ominous clouds on the horizon for NRM and
environmental funding and the organisations which dispense these funds. Today’s
productivity growth is tomorrow’s economic growth (and budget surpluses), so
subsequently productivity figures take on a real sense of importance. In Australia, as
previously indicated by Professor Garnaut’s recent comments, the productivity boom
of the 1990’s has been replaced by a productivity crash, down from 2.1% pa in the
1990’s to an average of 1.5% pa in this decade but just 0.6% pa over the past 4 years.

Until recently we have ignored three prime drivers of productivity growth –
significant and sensible investment in infrastructure and education plus reduced
business regulation.

This slowdown in productivity growth if it continues will be occurring in tandem with
the adverse economic impacts associated with an aging population.

So what does all of this mean for NRM investment? In essence it means more
pressure on government budgets going forward and potentially reduced funding for
the environment as expenditure on “ageing population” programmes rise over time.

Subsequently, CMAs and other similar bodies will almost certainly need to look at the
development of “self funded” investment programmes. Importantly, and whilst still
very embryonic, this process is starting to occur. For example, a number of regional
NRM bodies have established Environmental Trusts which will seek funding from
non-traditional sources. This process may need to gather increased momentum if
current NRM funding levels are to be maintained going forward.

6. Concluding Comments

Whilst this paper has focussed on a number of factors that could adversely impact on
future agricultural sector productivity and profitability trends and the subsequent
capacity of farm sector businesses to have the liquidity to support NRM investment
funding based on a public and private benefit model, it has also raised issues related to
the future level of public sector NRM funding.

Notwithstanding this, all entities involved in NRM investment activity need to remain
focussed on achieving triple bottom line outcomes – improved environmental
outcomes, increasing the adaptive capacity and resilience of industry and good socio-
economic outcomes. To achieve this these entities must:
- 11 -

• Remain cognisant of the social and economic environment confronting regional communities.
• Develop innovative NRM investment and engagement programmes that develop and/or allow for trade-offs that provide for second and third best solutions rather than no solution at all.
• Maintain flexibility in their approach to NRM investment that allows for the incorporation of new scientific information.
• Develop strong and innovative partnerships capable of adjusting to a dynamic economic environment.
• Establish baseline NRM monitoring that ensures both public and private investment funds are utilised efficiently.
• Look to develop NRM investment vehicles that are not dependant on taxpayer funding.

Going forward, given what appears to be some inevitable pressures on the availability of both public and private sector funding, efficient and effective NRM investment programmes must be the order of the day.