Looking beyond the farm gate
Closer vertical coordination along value chains as a means of improving farm performance

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Key points

- Closer vertical coordination in agricultural value chains reflects a movement toward more closely specified marketing arrangements between farmers and other businesses, such as through the use of supply contracts and alliances.

- Consumer demand for greater quality and choice, emerging technologies, and consumer protection regulation are driving increased product differentiation and greater information needs. Closer vertical coordination can reduce the costs of guaranteeing product quality by improving information flows along value chains.

- Closer coordination with buyers may improve farm performance through access to better market intelligence, exclusive technologies or technical information, lower transaction costs, and the opportunity to smooth income. It may also increase productivity where it creates an operating environment more conducive to investment and innovation. However, in industries characterised by greater use of contracts, some farmers have raised concerns over possible anti-competitive behaviour by buyers.

- There is a role for government in value chains in ensuring policy settings encourage innovation in business practices and marketing, securing access for Australian products to overseas markets, and reducing transaction costs that act as a barrier to farmers participating in value chains.

- While farmers can benefit from off-farm research and promotion, industry research funding should reflect the relative payoffs from farm and off-farm investments.

Introduction

Spending less time in paddocks and more in offices has enabled many farmers to boost their productivity and profitability. For some, this has meant looking beyond the farm gate and down the value chain. Although not a new idea, shifting consumer preferences and emerging technologies are driving some producers to consider the benefits of developing closer ties with downstream users. Since the 1990s Australia’s livestock industries have become more ‘market focused’ in response to increased competition between meat industries and in export markets (ABARE 2004a, b). In other industries, such as horticulture, producing high-quality produce and selling direct to retailers are viewed as key opportunities for growth (Thompson & Zhang 2012).

Increasing interest in closer vertical coordination, reflecting a movement toward more closely specified marketing arrangements between farmers and other businesses in agricultural value chains, has coincided with efforts by rural industries and governments to identify new ways to improve farm performance. Both have long viewed productivity growth as a leading driver of economic growth and living standards. However, their focus has broadened to encompass the full range of factors that may affect farm performance, with some commentators pointing to a lack of market insight and fragmented value chains as impediments to growth in food and fibre industries (Ball 2012; Fearne 2009).
A greater focus on off-farm issues may significantly affect research and development (R&D) investments. There is a perception that farmers have a lot to gain from off-farm research and, as farmers form closer ties along value chains, there may be scope for wider investment. However, to get the most out of scarce R&D funds the relative payoffs need to be considered, as well as how these will make farmers better off.

This paper will:
- discuss the factors driving closer vertical coordination
- examine the links between closer vertical coordination and farm performance
- review how farmers benefit from R&D and promotion undertaken at different parts of the value chain
- consider implications for industry and government.

### About closer vertical coordination

Agricultural value chains comprise the different stages of production and marketing until final consumption. These stages can be viewed as vertically-linked activities that generate value for consumers.

Although all value chains inherently involve some coordination, it has often been at ‘arms length’, relying on open-market price signals and basic commodity descriptions of agricultural products. Little or no contact between buyers and sellers meant minimal or no negotiation over transaction terms other than price, as at livestock auctions. Increasingly, marketing arrangements that involve closer coordination are being seen as a way to increase value chain efficiency and boost profitability by better matching farm outputs and buyers’ preferences (see Box 1).

### Box 1 Forms of vertical coordination

| **Spot markets** | Goods are exchanged between multiple buyers and sellers on the basis of price alone, without prior coordination on product attributes or transaction terms. Farms control what is produced, how and when, and the buyer either accepts the product in its current form, or does not purchase it. Selling through saleyard auctions is an example of a spot market. |
| **Direct selling** | The price farmers receive varies in accordance with how well the product meets the buyer’s quality specifications. In the beef and lamb industries, direct selling methods include ‘in the paddock’ and ‘over the hooks’ sales, where price varies according to how well animals meet specifications. Direct selling methods provide farmers with feedback and manage carcass quality by reducing handling and stress relative to saleyard and auction sales. |
| **Contracts** | Farms transfer control over aspects of marketing and/or production to the buyer. While contracts can be renewed, each contract is for a finite period, such as one or more growing seasons. Contracts use financial incentives to align farmers’ activities and buyer preferences and mitigate a variety of risks for farmers and buyers present in spot markets. Three broad types of contract are commonly used: forward selling supply contracts (specifying price, quantity, quality and transaction time); production contracts (specifying which production processes are to be used); and resource-providing contracts, where buyers supply particular inputs. |
| **Strategic alliances** | A mutually beneficial agreement between vertically related firms to serve a common strategic objective. Although contracts may be used (placing legal obligations on parties), alliances are often more flexible, relying less on formal arrangements and more on trust. A distinguishing characteristic is that the alliance is recognised as a source of competitive advantage. |
| **Vertical integration** | A single firm owns multiple stages of the value chain. Managerial orders guide movements through production, processing and distribution rather than price signals. |

Sources: Hobbs (1996); MacDonald et al. (2004); ABARE (2004a)
contracts and alliances, farmers are aligning their production with value chain partners by coordinating more closely on:

• what is produced—quality, as defined by product specifications
• how it is produced—the technologies and management practices used
• when it is produced—the timing of product delivery to buyers.

**Drivers of closer vertical coordination**

The main incentive for closer vertical coordination along value chains ultimately stems from opportunities to pursue higher profits through lower transaction costs; that is, the costs of reaching and enforcing an exchange. Firms incur these costs in the course of: searching for information, bargaining and contracting, monitoring and enforcing contracts, maintaining product integrity (from the farm to final consumers) and complying with government regulation. These costs can be higher where farmers, processors or retailers choose to differentiate their products from generic commodities.

Historically, farmers and processors have used contracts to lower the transaction costs of managing recurring production and marketing risks. In the dairy, meat, horticulture and floriculture industries in particular, farm products begin to perish from the moment of harvest and risk further damage during supply chain storage and transport. Contracts reduce the risk for farmers of product damage and losses due to the inability to find a buyer. At the same time, processors have used contracts to manage the risk of not finding a given quality and quantity of products within the timeframes required to manage product flows into processing plants.

Further opportunities have arisen following reforms to statutory marketing arrangements that, in effect, prevented farmers from engaging more closely with buyers. Subsequent deregulation has sharpened price signals and increased price volatility, stimulating entrepreneurs to find new ways of selling and managing price risk. For example, following the abolition of Western Australia’s single desk for domestic and export lamb marketing in 1999, farmers were able to develop alliances with processors and retailers to produce higher-quality branded lamb (National Farmers’ Federation 2004; Productivity Commission 2005).

Beyond the evolution of contracts to manage production and marketing risks, and the effects of ‘one-off’ policy reforms, commentators have identified three broad categories of drivers that have persistently motivated firms to coordinate their activities more closely (Barkema & Drabentstott 1995; Henderson 1998; Hobbs 2003; Hobbs & Young 2000). Discussed in more detail below, the three broad categories of drivers are:

• consumer demand for greater quality and choice
• emerging technologies
• consumer protection regulation.

These drivers have, in one way or another, changed the nature of market transactions which, in turn, have increased transaction costs. Most commonly, the changes have accompanied product differentiation and ensuing demands for more, higher-quality information, which can be cheaper to provide with closer vertical coordination.

**Consumer demand for greater quality and choice**

Increasing demand by consumers for greater quality and choice is spawning niche markets for farm products. Analysts have identified a raft of reasons, including rising incomes (particularly in Asia), shifting demographics (chiefly population ageing), changing lifestyles (more single person households) and increasing consumer expectations about how food is produced (Kim et al. 2010; Spencer & Kneebone 2012). Now, many food producers are differentiating their products by nutritional characteristics, place of origin, or practices that are animal-welfare friendly or organic, among other things.

However, product differentiation can involve additional transaction costs associated with searching for inputs that meet quality specifications, discovering consumer preferences, implementing traceability and identity preservation systems, managing information flows and providing assurances over output quality. To assure output quality, it is generally costly for downstream firms and consumers to verify experience attributes (such as taste) and credence attributes (which cannot be identified even after purchase and consumption, such as production methods used) before purchase and consumption (O'Keefe 2008).
Through closer vertical coordination, downstream firms can increase their influence and control over production processes, thereby reducing uncertainty and protecting the returns to product-specific investments, typically brands, certifications and specialised equipment (Barber & Cutbush 2005; VCG Australia 1997). For example, to reduce the overall quality assurance burden, some processors supply key inputs (such as feed and veterinary support) to their contract growers and prescribe particular management practices (Martinez 2002).

**Emerging technologies**

Emerging farm and food processing technologies alter the incentives for buyers and sellers along the value chain to coordinate more closely. They enable producers to differentiate production to target particular market segments, facilitating consumer choice. However, they may also raise transaction costs, often because firms need more information to deal with new risks and increasing uncertainty about market outcomes (in particular, product attributes, reliability of supply and level of demand). Adopting new technologies may also lock producers into specific production systems, exposing them to opportunistic behaviour in markets with relatively few buyers. For example, over time a lone buyer could force farmers to accept lower prices for a relatively unique product because they cannot realise a higher return in any other market segment. Closer vertical coordination may lower transaction costs by, among other things, improving the efficiency of information flows about specific product attributes or the nature of the technology used.

Non-adopters of new technologies may also have incentives to coordinate more closely with their suppliers and buyers. In recent years this has occurred where some consumers view a new technology negatively and continue to demand products produced using the conventional technology. In the case of genetically modified (GM) crops, firms involved in supplying non-GM products have used closer vertical coordination to lower the costs of implementing identity preservation systems. Verifying the absence of GM material in open markets is likely to be more costly because the use of gene technology is a credence attribute and so can be misrepresented.

**Consumer protection regulation**

Closer vertical coordination can also provide a lower cost solution for firms having to comply with consumer protection regulation, again by lowering the cost of acquiring information about product attributes. The food industry falls under several regulatory systems intended to protect consumers from misleading and deceptive product marketing, as well as unsafe food products, namely, the *Competition and Consumer Act 2010* (formerly the *Trade Practices Act 1974*) and the Australia New Zealand Food Standards Code. Broadly speaking, compliance is generally costly because being able to substantiate claims about product attributes requires that producers keep detailed records and document procedures. Given these regulations make firms liable, it is prudent and natural for them to closely coordinate with suppliers to provide appropriate quality assurance. In effect, downstream firms have an incentive to impose private standards on suppliers to increase information about (and possibly control over) upstream production practices, as a way to manage regulatory risks (Hobbs & Young 2000).

**Closer vertical coordination and farm performance**

It is reasonable to assume that closer vertical coordination has led to higher farm profits in many instances. However, this may not be true for all farmers looking beyond the farm gate. There are advantages and disadvantages that need to be weighed, which can vary considerably between individual agricultural industries. Nevertheless, significant interest in closer vertical coordination in agriculture from industry and government points to expectations of improved performance. In addition, because closer coordination creates an operating environment more conducive to investment and innovation, there are likely to be productivity impacts.
Advantages of closer vertical coordination

For firms that are ‘channel captains’ or economic leaders in a value chain, closer vertical coordination offers clear advantages, especially if those firms are also closest to consumers. Efficiency gains from improved information flows can be a source of competitive advantage over firms in other, more fragmented value chains. And, as outlined previously, closer vertical coordination can reduce the costs of managing reputational and regulatory risks, which might arise where product quality is unreliable or misrepresented, or where there are breakdowns in food safety. Although farmers are rarely leaders in a value chain, there are several reasons why they may consider closer coordination with downstream firms:

- improved market intelligence
- access to exclusive technologies and technical information
- lower transaction costs
- opportunities to smooth income.

Farmers have identified access to market information and information on best practice and other production related matters as important benefits of closer coordination with buyers, most recently by dairy farmers proposing to negotiate milk supply arrangements directly with Woolworths (ACCC 2013).

Improved market intelligence is a prime reason for farmers to coordinate more closely with downstream buyers. It enables farmers to produce higher-valued outputs, tailored to better suit consumer preferences. Individual feedback and technical advice from buyers further assists farmers to supply higher-quality produce. Preferred attributes extend beyond higher and more reliable quality to include delivery schedules.

Farmers may gain access to exclusive technologies and technical information developed by their value chain partners that enable them to operate more efficiently and produce higher quality outputs. For example, some processors may supply contract farmers with superior inputs that are unavailable outside their value chain (Key & McBride 2008; MacDonald et al. 2004). Similarly, some technologies are only available through contracts with input providers; for example, specific traits embodied in proprietary crop and pasture varieties (Hobbs & Young 2000; Keogh 2005; Reynolds 2007).

Closer coordination with buyers may also lower transaction costs for farmers, particularly the search costs arising from locating buyers for more specialised products.

Opportunities to smooth income may attract some farmers. Although their guaranteed return is likely to be less than that achieved in an open market (MacDonald et al. 2004), risk averse farmers may prefer to shift some risks onto buyers. For example, buyers bear output price risks of forward contracts entered into before harvest. Likewise, production contracts that contain input supply arrangements shift input price risk from farmers to buyers (often processors), who typically can manage those risks more efficiently. Although buyers are not necessarily less risk averse than farmers, they may be less exposed to price risk to the extent that they can source inputs from different regions and sell in different markets (MacDonald et al. 2004).

Disadvantages of closer vertical coordination

Many of the concerns about closer vertical coordination in agricultural industries centre on possible anti-competitive behaviour. In industries characterised by few, large buyers, farmers have raised concerns about the misuse of market power to pay unfairly low prices or impose unfair contract terms. Specific concerns have included:

- imposing costs, risks and responsibilities on farmers without paying premiums in return (for example, meeting packaging requirements and private standards)
- applying unrealistic or flexible quality standards as a basis to pay lower prices or reject products
- engaging in unfair negotiating practices (ACCC 2008; Keogh 2005; Martin 2005; Senate Select Committee on Agricultural and Related Industries 2010; Umberger & Griffith 2011).

The Australian Competition & Consumer Commission (ACCC) has recognised the weak bargaining position of individual farmers compared with processors and retailers. Although the Commission (and other commentators) has not generally found evidence of anti-competitive behaviour (drawing attention instead to the effects of prices in export markets on contract prices paid to farmers), it has authorised collective bargaining agreements in many industries (ACCC 2008; Umberger & Griffith 2011).
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In part, this dispensation recognises that access to a given value chain may require farmers to invest in specific assets (such as specialised skills, production processes, capital equipment, and livestock genetics) to meet buyer quality standards and specifications, or to achieve an efficient scale of production (ACCC 2011; Hobbs 1996). Such requirements can disadvantage farmers in negotiating transaction terms, especially if there are few alternative buyers. Buyers may be able to exert downward pressure on prices paid to farmers who have invested heavily in capital which is costly to adapt to alternative uses, or have already committed resources to production in a given season (Martinez 2002). Farmers producing high-quality products with a specific end use may also face similar risks (Box 2).

Box 2 Risks associated with value chain dependence in agriculture

While closer vertical coordination has its advantages, increased dependence on value chain partners can narrow producers’ options. Two risks that effectively lock producers out of alternative possibilities include asset specificity and temporal specificity.

Where there are few alternative buyers, asset specificity exposes growers to the risk that a buyer will act opportunistically to alter contract terms to their own advantage, such as by offering a lower price than previously agreed. Broiler growers are characterised by physical asset specificity and site specificity, which may expose them to opportunistic behaviour by processors. To optimise growth rates and increase efficiency, growers invest in specialised sheds that allow them to control ventilation, temperature and humidity, and feeding regimes. Physical asset specificity arises because broiler sheds have few alternative uses without significant adaptation costs (such as egg production). Site specificity arises because broiler farms are often located near processors to reduce transportation costs and stress-related losses during transport. As a result, broiler enterprises are most valuable when used to supply nearby processors, with few or no alternatives to sell their product, or use their assets for other production (ACCC 2011).

Another risk of value chain dependence is temporal specificity. In the horticulture industry, where produce is highly perishable or growth can rapidly alter its specifications, temporal specificity arises where the timing of product delivery is important to maintain quality and value. If buyers hold up acceptance of produce, producers may not be able to find alternative buyers without incurring higher transport costs or quality losses (MacDonald et al. 2004; Martinez 2002).

Another consideration for some farmers is the extent to which buyers gain influence, even control, over the farm business, thereby reducing their autonomy. In some instances, vertical marketing arrangements require farm management, marketing or investment decisions to be made jointly with buyers. In other instances, buyers may require farmers to attend training, use their inputs, follow prescribed management practices or use a specified technology.

Although farmers may be compensated for this loss of autonomy by lower income risk or higher prices, they may forgo returns to their entrepreneurial capacity and the option to take advantage of fortuitous market conditions elsewhere. And while access to technical information and improved inputs may increase farm productivity and chain profits more broadly, farmers’ profits may not increase. This might be the case if a processor is providing the technologies and management that increase profits and bearing the risks associated with new technologies, and the contracted farmer is only providing labour and other fixed inputs (Young & Hobbs 2002).

Implications for productivity

In recent years there has been interest in understanding the extent to which closer coordination by farmers along the value chain can improve productivity, particularly on-farm productivity. As a broad observation, such arrangements have the potential to boost agricultural productivity to the extent that farmers can produce more, higher-valued outputs from a given quantity of inputs. This conclusion follows for several reasons. First, expending fewer resources on transaction activities enhances productivity.

Second, more certain market outcomes, coupled with higher quality information flows, are conducive to greater innovation. This includes investment in more efficient technologies and management practices and the production of higher-valued outputs. Lower income risk can encourage farmers to take on more debt to support investment in more efficient technologies and management practices (Key & McBride 2008) and also make it easier to access credit, reducing financial constraints to innovation. In Australia, rural lenders appear to encourage farmers to secure at least a part of their returns when making substantial investments,
especially those designed for specific purposes (Barber & Cutbush 2005). Where farmers are able to produce higher-valued outputs, although improvements in quality are not necessarily costless, they can enhance productivity to the extent that higher valued outputs are produced without increased input use.

Third, greater market certainty provides a further impetus for farmers to invest in specific assets. This can lead to higher productivity as farmers make more efficient use of capital by becoming more specialised (Chavas 2001). Without the certainty provided by long-term marketing arrangements, farmers may under-invest in specific assets to reduce their exposure to opportunistic behaviour by buyers, instead investing in or retaining more flexible, less efficient technologies that can be used for a wider range of buyers (Martinez 2002).

**Payoffs to R&D along the value chain**

If farmers are increasingly looking to closer vertical coordination to improve farm performance, by extension, should they also invest more in off-farm R&D and promotion? Some believe that the payoffs to such activities are high. For example, improved insight into consumer preferences and new technologies that enhance the quality of foods processed prior to export may provide opportunities for growth (Ball 2012; Fearne 2009).

Processors are integrated into the rural R&D system and some pay levies under the *Primary industries Excise (Levies) Act 1999*, the *Primary industries Customs (Charges Act) 1999*, and the *Primary Industries Levies and Charges Collection Act (1991)*. Levies are collected from processors by the Department of Agriculture, Fisheries and Forestry, and forwarded to the relevant RDC. In some industries processors are able to recover levies paid from relevant producers. In other industries processors are themselves liable:

- red meat processors pay levies to the Australian Meat Processor Corporation on cattle and livestock that are processed
- timber mill operators pay the forest industries products levy to Forest & Wood Products Australia
- sugar mills pay 50 per cent of the sugar cane levy to the Sugar Research and Development Corporation
- winemakers pay the wine grape levy if they own the product at the time it is made into wine, and the grape research levy if they own the product at the time of delivery for crushing (to the Grape and Wine Research and Development Corporation).
The rural research and development corporations (RDCs) already take a whole-of-value-chain approach to research. Rather than focusing only on on-farm issues, the RDCs also invest in areas such as quality and food safety management across value chains, and processing innovations. The industry owned corporations also undertake marketing and promotion activities, which the Productivity Commission (2011) has recommended extending to statutory RDCs (provided these activities are funded by industry). More generally, government recognises the importance of looking beyond the farm gate through its Rural R&D Priorities, which aim to:

... better understand and respond to domestic and international market and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers (DAFF 2007).

**Farmer benefits from off-farm research and promotion**

Normal competitive processes distribute the benefits and costs of off-farm research along all stages of the value chain (Box 3). In general, farmers can share in the benefits from lower processing and marketing costs or increased retail demand through higher demand for their production. While many factors affect the overall distribution of benefits in a competitive market, the extent to which farm and non-farm inputs are substitutable in producing final goods is particularly important. This is because the share of total off-farm research (or promotion) benefits accruing to farmers decreases as the scope for input substitutability increases.

In theory, post-farm sectors have either no flexibility to substitute farm and non-farm inputs (inputs are combined in fixed proportions), or they have some flexibility (variable proportions). Where farm and non-farm inputs are combined in fixed proportions, farmers have an incentive to maximise total (industry) benefits from research investments because this also maximises their benefits (Box 3). However, because substitution between farm and non-farm inputs is possible for most food products, farmers will receive a lower share of benefits from off-farm research (or promotion) than for on-farm research. As research lowers the cost of non-farm inputs (such as marketing) relative to the farm input, industries are likely to shift toward producing goods that embody relatively more processing and marketing; for example, ready-to-eat meals.

Although the amount of the farm product present in the final good may not change, its proportion may (Reed et al. 1997; Zhao et al. 2000). In this case, the share of the benefits from off-farm research passed back to farmers will be lower than the share from farm research.

**Implications of closer vertical coordination for R&D policy**

Should farmers (through the RDCs) reallocate research funds and invest more in off-farm R&D and promotion? In some industries the value added to farm products is large. In absolute dollar terms, farmers may gain more from a given improvement in processing or marketing efficiency than from the same relative improvement in on-farm productivity, even if their share of total benefits is smaller (Zhao et al. 2000). Farmers may also have a lot to gain from promotion and product differentiation if it increases demand for the farm product. However, on-farm R&D directly benefits farmers.

In some industries it may be worthwhile in-principle to invest in R&D that is in the interest of the whole chain, rather than a given production stage. This might be the case if farmers and processors are highly interdependent or integrated, or where farmers depend heavily on a domestic processing chain to reach final markets, such as in the meat and dairy industries. Some have argued that, for farmers to benefit fully from higher productivity on-farm, increases in processing productivity gains are also needed to ensure there is sufficient capacity to handle increased agricultural output (Borrell et al. 2012).
Box 3 Distribution of benefits from research or promotion

The degree of flexibility (that is, input substitutability) with which farm production can be combined with non-farm inputs to produce final goods is a crucial factor influencing farmers’ share of the benefits from off-farm research or promotion (Zhao et al. 2003). Where farm and non-farm inputs are combined in fixed proportions, the share of benefits accruing to farmers will be the same from off-farm research as from on-farm research.

Consider a simple two-stage industry where farm and non-farm inputs (here, marketing services) are combined in fixed proportions to produce the retail product. Demand for the farm product and marketing services are derived from retail demand, while retail supply is the sum of farm production and marketing costs. Equilibrium prices and quantities determined in the retail market also determine price formation in commodity and wholesale markets.

Following Alston (1991), research that lowers marketing costs (SM_0 to SM_1) also reduces the costs of the retail product (SR_0 to SR_1). As consumers purchase more of the retail product at the lower price, demand for the farm product increases (DF_0 to DF_1).

The marketing sector benefits because the gains from lower costs and increased production outweigh the effect of lower prices for marketing services; consumers benefit from lower prices; and farmers benefit from higher prices due to higher demand for the farm product.

In general, the shares of total benefits to farmers, the marketing sector and consumers will depend on how responsive farm supply, marketing supply and retail demand are to price changes—with a larger share going to sectors that are less responsive to price (more inelastic). In the above example, if retail demand is more price inelastic than both the supply of marketing services and the farm product, consumers will receive a larger share of the benefits from research even though the innovation took place in the marketing sector. Conversely, if the supply of farm products is relatively more inelastic than both retail demand and the supply of marketing services, farmers will receive a larger share of benefits (Freebairn et al. 1982).

In this model, the distribution of benefits is the same regardless of whether research induces a downward shift in farm or marketing services supply, or promotion or quality improvements increase final demand. This is because the farm product and marketing services are used in fixed proportions (the marketing sector cannot substitute between farm and marketing inputs in response to a change in their relative prices). However, in practice, it is more likely that input proportions can vary. Where considerable flexibility exists, a larger share of the benefits from off-farm research will be captured off-farm, and a smaller share to farmers, relative to on-farm research.
Such findings lend weight to the belief that farmers have more to gain from off-farm R&D than on-farm R&D aimed at improving productivity (Alston & Scobie 1983; Zhao et al. 2001). In the past there have been concerns that such perceptions would guide resource allocation (rather than consideration of the benefits and costs) at the expense of research into traditional agriculture (Lloyd 1988; Watson 1993). For example, past advocacy of further value-adding in Australia was seen to reflect a belief that farmers would receive higher and more stable returns from differentiated and more-highly processed products. Advocates recommended that Australia move away from commodities by increasing its processing of farm output (‘adding value’), in tandem with more innovative marketing, and that research funds should be reallocated to match these priorities.

Now as then, farmers should assess off-farm R&D and promotion activities rigorously, including opportunities to value-add on-farm or via further processing domestically. Adding value necessarily involves adding costs, and research funding should reflect the relative payoffs of farm and off-farm investments, rather than specific objectives such as differentiating production. A decision to reallocate funds away from on-farm R&D should be based on benefits and costs, recognising that input substitution or less than perfect competition downstream may mean that processing or marketing stages capture a larger share of benefits.

Similarly, if farmers place a high value on generic promotion, they may choose to allocate levy funds accordingly. This might be the case where industry or Australian branding is a clear quality signal for consumers. However, not all farmers will benefit from industry-led marketing campaigns, and may even be harmed by association with break-downs in food safety elsewhere in an industry, or by generic promotion implying all brands are equally as good (Crespi & Marette 2002; Nason 2012). Those farmers may choose to market their own brands in preference to paying levies for generic promotion. More generally, efforts to target products to increasingly diversified markets may be best served by private promotion.

Regardless of whether farmers choose to invest more off-farm, government is likely to have a smaller role in off-farm research that is focussed on issues where the benefits can be captured by individual businesses. Businesses in the private sector have an incentive to undertake R&D in processing and marketing because they can capture the returns from investments in product differentiation through brands. They also have recourse to intellectual property mechanisms to restrict the use and distribution of technology outside their value chain. This is in contrast to government’s funding of on-farm R&D that induces additional, socially valuable research, to the extent that the free-rider problem results in under-investment by farmers.

In fact, downstream sectors in many rural industries can and do invest in R&D. The red meat processing, broiler and fruit canning sectors have all indicated their industry members make substantial in-house investments in R&D (Australian Meat Processor Corporation; Australian Chicken Meat Federation; and Canning Fruit Industry Council of Australia in submissions to Productivity Commission 2011).

Finally, a substantial shift in industry research focus that increases off-farm R&D may yield significant and immediate industry-wide payoffs, but at a future cost. In the long run, the extent to which Australian farms can maintain or improve their international competitiveness depends mainly on their ability to increase productivity relative to competitors in export markets. Given long lags before research investments yield technologies for farmers to adopt, R&D investment decisions made now can affect productivity outcomes in the future. This trade-off also needs to be considered when allocating research funds.
**Conclusion**

While many farmers choose to produce and market their products independently, others are considering alternative, closer forms of vertical coordination, such as supply contracts and alliances with buyers. These marketing arrangements can increase farmer profits through lower transaction costs, and may improve agricultural productivity to the extent that better information flows enable farmers to produce more, higher-valued outputs without increasing input use.

Given that higher profit is the ultimate purpose of closer vertical coordination, there are limited grounds for governments supporting particular value chains. In particular, the private sector is less likely to under-invest in socially valuable off-farm research than in traditional farm production research. Closer vertical coordination in agricultural value chains may also mean that generic promotion of commodities may become less important over time.

In general, any government involvement in value chains should be guided by evidence of market failure and where the aggregate benefits from government intervention exceed the costs. Governments can ensure policy settings encourage innovation in business practices and marketing, and that Australian products have access to overseas markets. In addition, government can make it easier for farmers to participate in value chains where high transaction costs are a barrier to negotiating with buyers; for example, by authorising collective bargaining where appropriate and facilitating dispute resolution.
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Looking beyond the farm gate

Closer vertical coordination along value chains as a means of improving farm performance

The ‘Biosphere’ Graphic Element

The biosphere is a key part of the department’s visual identity. Individual biospheres are used to visually describe the diverse nature of the work we do as a department, in Australia and internationally.