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The Impact of the Zespri Kiwifruit Export Monopoly on Innovation Incentives

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1. Executive Summary

The long-term interests of New Zealand kiwifruit growers are best served by having an industry structure that facilitates innovation and investment. While kiwifruit sales internationally have historically been dominated by the Hayward (green) variety, New Zealand's international competitors are investing considerable R&D across a number of new varieties of green, yellow and red kiwifruit, many of which have advantages over the Hayward variety. The benefits of successful innovations can be very large – we estimate the current value of the annual benefits to New Zealand growers of the Gold kiwifruit innovation as being $206.9m to date, and to be approximately $200m looking forwards over the next 10 years.

In order to maximise the prospects of repeating such gains and to compete with overseas R&D, it is our view that the Zespri regulated monopoly needs to be removed. We recognise that Gold kiwifruit was developed by Zespri, but our point is that dynamic gains of this magnitude are more likely to occur if Zespri is deregulated, so that a variety of commercial strategies can be employed. The monopoly means that growers have "all their kiwifruit in one basket" in being tied to one commercial strategy beyond the orchard gate, and will find it difficult to benchmark Zespri's productive and dynamic performance. In addition, because Zespri operates in the same mode as a cooperative, it is likely to be capital constrained, reducing its ability to invest in R&D.

Furthermore, the Zespri monopoly is likely to make it more difficult for other firms to appropriate the value-added benefits of their New Zealand R&D, therefore reducing their R&D efforts in New Zealand.

Finally, deregulation of the Zespri monopoly is likely to increase the pressures on Zespri to cut its own costs – we estimate these "productive efficiency" gains from deregulation to be $5.3m per annum.

2. Introduction and Motivation

Zespri has a regulated monopoly on exports of New Zealand grown kiwifruit to countries other than Australia. The efficacy of "single desks" has been controversial, and several have been removed in New Zealand, Australia, South Africa and Israel. Often a large element of the liberalisation debate has concerned whether single desks provide market power and/or prevent "weak selling".

There have been claims to the effect that the single desk for kiwifruit has led to export price premiums. However, it is difficult to ascertain whether any price premiums achieved are attributable to the ability of the single desk to achieve price increases by withholding or reshuffling supply across markets, or whether they are due to other factors such as careful vertical coordination, branding or quality that could occur in a competitive environment absent the single desk. Economic studies of single desks have found little rigorous empirical support for market power claims. For example, Sinclair (1999, p.2), in his analysis of market power of New Zealand single desks, concludes that "there is no compelling evidence that New Zealand can exercise market power in world food markets".[1] Similarly the Australian Productivity Commission (2000, p. XVII) found that market power from Australian single desks is likely to be "significantly constrained" in international export markets.[2]

In the case of Zespri, we note that New Zealand's share of world kiwifruit exports (by volume) has fallen from 54% in 1990 to 29% in 2006,[3] and that there is likely to be competition from other fruits. MAF (2000, p.11), in the context of pipfruit, states that "New Zealand competes in a highly competitive global fruit market with high substitutability between different fruits".[4] This evidence makes it difficult to believe that New Zealand can exercise a material level of market power in kiwifruit export markets.

The purpose of this report is to analyse the implications of the Zespri monopoly for investment and innovation in the New Zealand kiwifruit industry. It is not to assess in any more detail whether the Zespri monopoly does or does not result in premiums for New Zealand grown Hayward and Gold kiwifruit. In our view, investment and innovation are the most important issues when it comes to considering the long-term interests of New Zealand kiwifruit growers. The Government has recognised this in its allocation of funding in its 2009 Budget to the primary sector; in association with which the Minister of Agriculture and Forestry stated that "[i]nnovation in the primary and food sector industries will be essential for New Zealand's long-term economic growth and improved environmental performance".[5]

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1 Sinclair, Geoff (1999), "Costs and Benefits of Producer Board Deregulation", Treasury Working Paper 1999/4.

2 Productivity Commission (2000), *Single-desk Marketing: Assessing the Economic Arguments*, Productivity Commission Staff Research Paper, AusInfo, Canberra.

3 Source: FAOSTAT, TradeSTAT database.

4 Ministry of Agriculture and Forestry (2000), "Review of the Regulatory Framework for Pipfruit Exporting", MAF Public Discussion Paper No. 23.

5 "Major boost for primary sector innovation", 28 May 2009, Available at: http://www.beehive.govt.nz/release/major+boost+primary+sector+innovation

This report is motivated by the observation that investment in R&D appears to be very important in the kiwifruit industry. Since New Zealand launched kiwifruit onto world markets in the 1960s, kiwifruit sales internationally have been dominated by the Hayward variety.[6] However, the world industry appears to be entering a more dynamic phase. For example, Testolin and Ferguson (2009) report evidence of considerable R&D in Italy across a number of new varieties of both green and yellow kiwifruit, many of which have advantages over the Hayward variety (such as earlier harvest, that among other things potentially avoids autumn frosts).[7] There is also evidence of R&D in China, with a yellow variety developed in China being marketed in Italy,[8] and a red-fleshed variety sold widely in Europe.[9] More generally, production of kiwifruit in China has increased rapidly in recent years, and while China currently exports only a small proportion of this, it has the potential to be a major player on world markets.[10]

The importance of new varieties is also suggested by price comparisons between the three categories of kiwifruit reported by Zespri (green, green organic and Gold), as set out in Figure 2.1 (orchard gate returns per tray) and Figure 2.2 (orchard gate returns per hectare (ha)). A clear price difference (in favour of the innovation, Gold, relative to green) has opened up over time. The forward-looking production costs per hectare of Gold kiwifruit are only marginally higher than those for green kiwifruit: we are advised by Turners & Growers that on-orchard costs average $22,000 per ha per annum for green and $25,000 per ha per annum for Gold. The difference in orchard gate returns per ha is much greater than this cost difference (for the 2008/09 season, $30,067 per ha for green and $60,885 per ha for Gold).[11] In fact, as Figure 2.3 suggests, since Gold kiwifruit is a higher yielding fruit (per hectare) than green kiwifruit,[12] it may be that the former's production costs per tray are lower.[13] Therefore the (forward-looking) "rents" from Gold kiwifruit appear to be materially higher than from green kiwifruit.

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6 Testolin, R., and A. Ferguson (2009), "Kiwifruit (*Actinidia* spp.) production and marketing in Italy", *New Zealand Journal of Crop and Horticultural Science*, 37, 1-32.

7 Testolin, R., and A. Ferguson (2009), *op cit.*

8 Testolin, R., and A. Ferguson (2009), *op cit.*

9 Apple and Pear Australia Limited (2006), "Apple and Pear World News: Week Ending 17/11/06", 9(40). Available at: http://www.apal.org.au/assets/content/1246/apple-pear-world-news-v9-no41.pdf

10 Kilgour, Mark, Caroline Saunders, Frank Scrimgeour and Eva Zellman (2008), "The Key Elements of Success and Failure in the NZ Kiwifruit Industry", Lincoln University Research Report No. 311.

11 Zespri 2008 Season Return Analysis

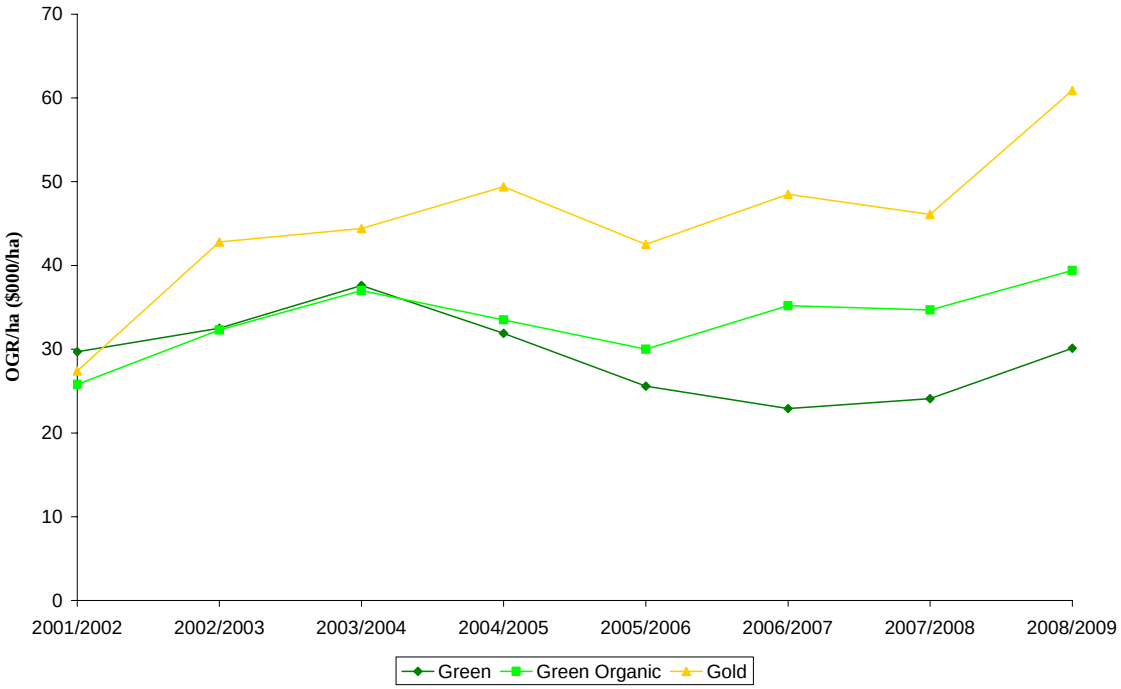
12 See also Testolin, R., and A. Ferguson (2009), *op cit* at p.9 who state that the Zespri Gold variety "is very productive and can carry far bigger crop loads than 'Hayward'".

13 Using costs per ha of $22,000 for green kiwifruit and $25,000 for Gold kiwifruit, and trays per ha in the 2007/08 season of 7,241 for green kiwifruit and 9,618 for Gold kiwifruit (Zespri Annual Report 2007/08), the costs per tray are $3.04 for green kiwifruit and $2.60 for Gold kiwifruit.

Figure 2.1: Orchard gate return per tray

Source: MAF Horticultural Monitoring Reports and Zespri Annual Reports (2000-2007) and Zespri 2008 Season Return Analysis (2008)

Figure 2.2: Orchard gate return per hectare



Source: Zespri Annual Reports (2001-2007) and Zespri 2008 Season Return Analysis (2008). Data for the 2000/01 season were not available.

Figure 2.3: Number of trays supplied per hectare

Source: Zespri Annual Reports (2001-2007). Data for the 2000/01 and 2008/09 seasons were not available.

In light of the international R&D investment and indicators of fruit performance over time, it is timely to consider whether the governance structures in the New Zealand kiwifruit industry are the most appropriate for maximising the long-term returns to New Zealand growers.

Over the long-term, the returns to growers will be maximised by successful investments in new products, production chain management and markets. In section 3 of this report, we explain why these "dynamic efficiency" gains are so important.

In section 4 of this report, we explain why the current regulated monopoly is unlikely to be an appropriate governance structure to maximise dynamic (and productive) efficiency, and therefore the long-term returns of growers. The monopoly means that growers have "all their kiwifruit in one basket" in being tied to one commercial strategy beyond the orchard gate, and will find it difficult to benchmark Zespri's productive and dynamic performance against like institutions. In addition, because Zespri operates in the same mode as a cooperative, it is likely to be capital constrained, reducing its ability to invest in R&D.

Furthermore, the Zespri monopoly is likely to make it more difficult for other firms to appropriate the value-added benefits of their R&D, therefore reducing their R&D efforts.

Finally, in section 5 of this report, we develop some indicative metrics to provide a "feel" for the magnitude of the potential benefits of deregulation of Zespri. We emphasise that to this point we have not undertaken any rigorous empirical analysis to determine these benefits, and

that our calculations are rough approximations. Nonetheless, the metrics we calculate do provide a very rough estimate of the magnitude of the benefits that are at stake.

From its introduction to international markets in 2000 to the most recent (2008/09) kiwifruit season, the compounded value of the annual dynamic efficiency benefit to New Zealand growers of the Gold kiwifruit innovation is conservatively estimated as being $206.9m. Further dynamic efficiency benefits are likely to accrue to growers in the future, given the apparent durability of the price premium that has opened up. Assuming that the number of trays of Gold supplied remains constant at 2008/09 levels for 10 years, and under various assumptions as to the future Gold price premium, we estimate the present value of the future annual dynamic efficiency benefits until 2019 as being approximately $200m. We note that these figures represent only the "producer surplus" gains (very loosely, profits) to New Zealand growers, as the "consumer surplus" gains accrue to overseas consumers of export kiwifruit. (We define the terms "producer surplus" and "consumer surplus" in section 3).

We recognise that Gold kiwifruit was developed by Zespri, but our point is that dynamic gains of this magnitude are more likely to occur if Zespri is deregulated, so that a variety of commercial strategies can be employed.

We also estimate that deregulation would result in productive efficiency gains of $5.3m per annum. We note that there are also likely to be other dynamic efficiency benefits from deregulation, which we have not attempted to quantify (e.g., arguably the development of new markets).

We have not estimated the offsetting costs of deregulation, but in light of our discussion regarding international markets and market power, and the Gold kiwifruit premium above, and the literature review in section 3, our view is that the dynamic benefits of deregulation are likely to materially exceed any credible estimate of the costs.

3. The Long-Term Interests of Growers

In this section, we outline the literature on static and dynamic efficiencies, and their relativities. We conclude that continued innovation in the kiwifruit industry is critical for the long-term returns of growers. The benefits from successful innovations are very large. Furthermore, if New Zealand's international competitors are investing heavily in R&D, New Zealand growers need to be careful not to rely too heavily on continued returns from the existing varieties. It would be sensible and grower welfare maximising to ensure that the industry incentives and structure facilitate investment and innovation.

It is widely recognised in the economics literature that monopoly (and monopsony) can reduce static (allocative and productive) efficiency.[14] Allocative efficiency, which refers to efficiency in resource allocation, is limited by a monopolist producing too little output and charging too high a price relative to the competitive outcome. Productive efficiency, which refers to efficiency in internal firm production, is limited by the monopolist adopting a less efficient and higher cost technology. Indeed, the traditional justification for deregulating monopoly has been to improve static efficiency (and to reduce surplus transfers from consumers to the monopolist).

However the economics literature also recognises that what really matters for long-term welfare and economic growth is dynamic efficiency. Dynamic efficiency is the efficiency (performance) of investment and innovation looking forward into the foreseeable future. Empirical evidence indicates that allocative inefficiency is trivial compared with productive inefficiency,[15] and that dynamic efficiency benefits swamp static efficiency gains.

A simple graphical representation of these points is shown in Figure 3.1. The graph in the left panel shows the static efficiency gains from deregulating monopoly. A monopolist produces an output level Q_m at price P_m, with its supply curve given by S_m. When competition is introduced, however, the supply curve shifts outwards to reflect the adoption of lower cost technology, while price falls and output rises to the competitive combination of P_c, Q_c. The allocative efficiency gains are given by the shaded "deadweight loss" triangle **A**, which results from the change in price and output. The productive efficiency gains are given by the shaded area **B**, resulting from the fall in costs. This contrasts with the dynamic efficiency gains shown in the right panel. Where deregulation of monopoly provides for investment and innovation that bring new products to the market, or entirely new markets, the efficiency gains are given by the entire shaded areas **C** (consumer surplus[16]) and **D** (producer

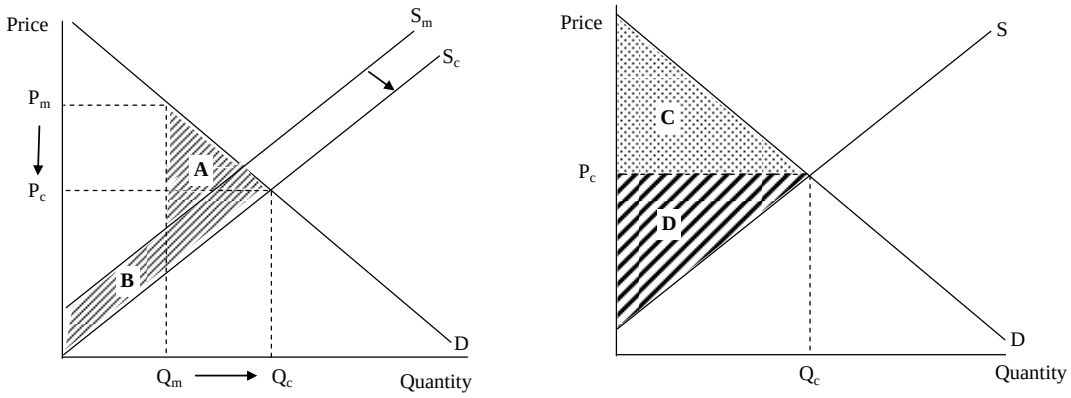
[14] For example, see Chapter 2 of Massimo Motta (2004), *Competition Policy: Theory and Practice*, Cambridge University Press; and Chapter 4 of Dennis Carlton and Jeffrey Perloff (2005), *Modern Industrial Organization*, Fourth Edition, Addison-Wesley.

[15] See footnote 5 of Ila Alam and Robin Sickles (2000), "Time Series Analysis of Deregulatory Dynamics and Technical Efficiency: The Case of the U.S. Airline Industry", *International Economic Review*, 41(1), 203-218, for relevant references. The intuition is that the productive inefficiency is present for each unit produced, while the deadweight loss triangle representing allocative inefficiency only applies to consumers who do not receive the product because of the higher prices.

[16] Consumer surplus is given by the difference between what a consumer is willing to pay for a product, and what the consumer does pay for the product, aggregated across all consumers.

surplus[17]), with the entire area referred to as "total surplus", that would otherwise not be achieved absent the new products or markets. While this graphical analysis is by no means a robust proof, it clearly indicates that the dynamic efficiency gains are well in excess of the sum of allocative efficiency and productive efficiency gains. It is also consistent with Goolsbee's (2006, p.4) claim, at least in relation to allocative efficiency, that "the entire surplus of a market usually dwarfs a traditional DWL [deadweight loss] triangle".[18]

Figure 3.1
Static Efficiency vs Dynamic Efficiency



The economics literature provides more rigorous evidence of the large benefits from innovation. A frequently cited analysis of the magnitude of dynamic efficiency gains is that of Hausman (1997).[19] Hausman develops a technique to measure the consumer benefits that arise from a new product. He applies this technique to voice messaging services and cellular telephone services, and estimates that the gain in consumer welfare from the introduction of cellular telephone services in the USA was about US$50 billion per year (for the period 1989 to 1993). In essence, this technique measures the consumer surplus that would be generated by a new product or market, i.e., the area **C** below the new demand curve and above the price generated by the new product in Figure 3.1.[20]

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[17] Producer surplus is given by the difference between what a producer receives for a product, and what that producer is willing to receive for the product, aggregated across all producers.

[18] Goolsbee, Austan (2006), "The Value of Broadband and the Deadweight Loss of Taxing New Technology", *Contributions to Economic Analysis and Policy*, 5(1), Article 8, 1-29.

[19] Hausman, Jerry (1997), "Valuing the Effect of Regulation on New Services in Telecommunications", *Brookings Papers on Economic Activity: Microeconomics*, 1-38.

[20] Petrin (2002) undertakes a similar analysis, estimating the gains in consumer and producer welfare from the introduction of minivans in the USA as approximately US$2.9 billion per year for the period 1984 to 1988. Amil Petrin (2002), "Quantifying the Benefits of New Products: The Case of the Minivan", *Journal of Political Economy*, 110(4), 705-729. Goolsbee and Petrin (2004) estimate the consumer welfare gains from the introduction of direct broadcast satellite television, as competition for cable television to be US$2-3 billion for satellite users and US$3-4 billion for cable users for a one year period (2001). Austan Goolsbee and Amil Petrin (2004), "The Consumer Gains from Direct Broadcast Satellites and Competition with Cable TV", *Econometrica*, 72(2), 351-381.

The total dynamic efficiency gains would be even larger, as they would include the producer surplus (the area **D** in Figure 3.1 below the price and above the new supply curve). In fact in the case of export kiwifruit our main interest is the producer (i.e., grower) surplus, as consumer surplus is captured by overseas consumers. Nonetheless, Hausman's result is still relevant in indicating that the dynamic efficiency losses of reduced investment and innovation are large in magnitude.

Other authors show that these losses are large relative to static efficiency losses. Goolsbee (2006) calculates the static (allocative) and dynamic efficiency losses from a hypothetical tax applied to broadband Internet in the US.[21] He calculates both the allocative efficiency losses from taxation, and the dynamic efficiency losses associated with the effect of the tax on delaying the diffusion of broadband in certain regional markets. He finds that the dynamic efficiency losses exceed allocative efficiency losses by a factor of 2-3.

Romer (1994) compares the allocative and dynamic efficiency losses from an import tariff.[22] While the comparison depends on the exact tariff rate, Romer demonstrates that the difference between allocative and dynamic efficiency losses is substantial. Allocative efficiency losses are approximately the square of the (percentage) tariff rate, while dynamic efficiency losses are approximately two times the tariff rate. For example, with an import tariff rate of 0.25 (25 percent of the price of the import), the dynamic efficiency losses (resulting from the loss of new goods that would otherwise enter the economy) will be approximately 8 times the allocative efficiency losses. For an import tariff rate of 0.1 the dynamic efficiency losses can be almost 20 times the allocative efficiency losses.

The importance of dynamic efficiency was also illustrated by the classic work of Robert Solow (1957).[23] In his study of the determinants of economic growth, Solow concluded that approximately 87 percent of the source of economic growth in the United States in the first half of the 20th century could be explained by investments in research and development and education, rather than by increases in capital and labour. That is, to use the language of Barnett (2007) in describing Solow's results,[24] economic growth from "dynamic forces" was approximately 7 times economic growth from "static forces". As Gilbert and Sunshine (1995) note, while other researchers disagree about the quantitative effects of research and development spending on economic activity, there is general agreement that such effects are substantial.[25]

There is also empirical evidence to show that the efficiency losses in moving from competition to monopoly exceed the transfer of consumer surplus to producers from the

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21 Goolsbee, Austan (2006), *op cit.*

22 Romer, Paul (1994), "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions", *Journal of Development Economics*, 43(1), 5-38.

23 Solow, Robert (1957), "Technical Change and the Aggregate Production Function", *Review of Economics and Statistics*, 39(3), 312-320.

24 Barnett, Thomas (2007), "Recent Developments in Antitrust and Intellectual Property Law", Presentation to the American Conference Institute's Third Annual In-House Counsel Forum on Pharmaceutical Antitrust, New York, May 16.

25 Gilbert, Richard and Steven Sunshine (1995), "Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets", *Antitrust Law Journal*, 63, 569-601.

increase in prices (i.e., the rectangle between P_m and P_c and across to Q_m in the left panel of Figure 3.1). Parker and Conner (1979) derive estimates of the static efficiency losses and surplus transfers due to monopoly in U.S. food manufacturing industries.[26] They find that the surplus transfer gains are approximately half the losses of productive efficiency. If, on the evidence above, we have dynamic efficiency greatly exceeding productive efficiency in importance, then transfers of producer surplus to consumers due to the introduction of competition will be a small fraction of the dynamic efficiency gains.

Other, more qualitative, evidence supports the findings above regarding dynamic efficiency effects.[27] Porter (2001) refers to the work of Solow and Schumpeter on the importance of innovation.[28] He argues that (page 922):

> *While protecting short-run consumer welfare measured by price-cost margins is undeniably important, the benefits of healthy competition are in fact broader and more essential to consumers and to society. The fundamental benefit of competition is to drive productivity growth through innovation, where innovation is defined broadly to include not only products, but also processes and methods of management. Productivity growth is central because it is the single most important determinant of long-term consumer welfare and a nation's standard of living.*

Similarly, Shapiro (2000, p.111) states, "[u]ltimately, performance is driven by innovation, not pricing".[29] Audretsch, Baumol and Burke (2001, 614) state:[30] [31]

> *In a dynamic economy competition in product and process innovations may have a more significant effect on welfare, at least in the long run, than does any likely variation in price.*

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[26] Parker, Russell and John Conner (1979), "Estimates of Consumer Loss Due to Monopoly in the U.S. Food Manufacturing Industries", *American Journal of Agricultural Economics*, 61(4), 626-639.

[27] Other empirical work includes that of Scherer and Ross (1990), who conduct an analysis on the trade-off between static and dynamic efficiency, showing that small gains in dynamic efficiency outweigh significant losses in static efficiency. Scherer, Frederic and David Ross (1990), *Industrial Market Structure and Economic Performance*, Houghton Mifflin Company.

[28] Porter, Michael (2001), "Competition and Antitrust: Toward a Productivity-Based Approach to Evaluating Mergers and Joint Ventures", *Antitrust Bulletin*, 46(4), 919-958.

[29] Shapiro, Carl (2000), "Competition Policy in the Information Economy" in Einar Hope (ed.), *Competition Policy Analysis*, Routledge Studies in the Modern World Economy, 109-132.

[30] Audretsch, David, William Baumol and Andrew Burke (2001), "Competition Policy in Dynamic Markets", *International Journal of Industrial Organization*, 19(5), 613-634.

[31] Nelson and Winter (1982) stated that, "over the long run the gains to society from continuing innovation are vastly greater than those associated with competitive pricing." Richard Nelson and Sidney Winter (1982), "The Schumpeterian Tradeoff Revisited" *American Economic Review*, 72(1), 114-132.

4. Monopoly Productivity and Innovation

4.1. Introduction

Zespri faces competition in its output markets. However, it is effectively a monopsonist buyer of kiwifruit in its key input market, given that the majority of kiwifruit supplied by New Zealand growers is exported,[32] and of that 92% is exported to markets other than Australia.[33] In other words, to a material degree, Zespri does not have to compete for growers. We would expect this governance arrangement to lead to a certain degree of productive and dynamic inefficiency, as we discuss below.

First though we note that the other concerns with monopoly (and monopsony) are allocative inefficiency and the transfer of surplus (in this case, from grower to the monopsonist). However, we note that Zespri operates in a similar way to a cooperative, by returning a portion of its profits to growers, which would mitigate market power concerns in the price paid for raw material by Zespri.

There is likely to be some allocative inefficiency in Zespri's operations. Zespri pools the returns it makes to growers. The Productivity Commission (2000, p.XXIII) states that pooling of returns across growers "tends to reward lower-valued products at the expense of higher valued products, discouraging the more efficient and innovative producers".[34]

4.2. Productive Inefficiency

As for a cooperative, each shareholder in Zespri has a relatively small stake in the company. For example, according to Companies Office records, the largest shareholder in Zespri owns approximately 1.3% of the shares. Therefore each shareholder has relatively little incentive and ability to monitor management, and negligible influence on the strategic direction of the company.[35] Under the single desk structure there can be expected to be just one commercial export strategy.

Furthermore, because Zespri is a monopoly, there is no clear basis for shareholders (growers) to compare the performance of management. Shareholders (growers) will find it difficult to know whether the costs incurred by Zespri are reasonable, and whether Zespri is undertaking an appropriate amount of R&D.

4.3. Dynamic Inefficiency

There are several aspects of the current New Zealand kiwifruit governance structure that hold back innovation.

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[32] In 2005 New Zealand production of kiwifruit was an estimated 318,000 tonnes, or which 312,545 tonnes (98%) was exported. Source: FAOSTAT ProdSTAT and TradeSTAT databases.

[33] Source: FAOSTAT TradeSTAT database.

[34] Productivity Commission (2000), *Single-desk Marketing: Assessing the Economic Arguments*, Productivity Commission Staff Research Paper, AusInfo, Canberra.

[35] See Tirole, Jean (2006), *The Theory of Corporate Finance*, Princeton University Press, for a careful analysis.

Firstly, Zespri is a monopoly. There is some empirical evidence that there is an inverted U-shape relationship between competition and innovation.[36] In other words, an increase in competition from the monopoly position is associated with an increase in innovation, while at the other extreme "perfect competition" is not conducive to innovation.[37] While the robustness of the evidence for this inverted U-shape relationship is debated, it is uncontroversial that a monopoly will be a less efficient innovator than a firm with rivals.[38]

Secondly, it is likely that Zespri faces the same type of capital constraints that Fonterra has stated concerns about, due to its effective nature as a cooperative. Richards and Manfredo (2003) also point to the capital constraints faced by cooperatives, where they state (p.153):[39]

> *Cooperatives' lack of access to equity markets and their mandate to return all profits to their owner-members, however, can create one unique motivating factor – namely, cooperatives tend to operate under conditions of severe capital constraint, typically relying on bank financing or bond issuance for the bulk of their capital needs.*

Under the Kiwifruit Industry Restructuring Act 1999, the initial shares in Zespri were allocated to growers. While these shares are fully tradable between growers, and growers who stop producing kiwifruit can continue to own shares, Zespri's constitution requires the board of directors to refuse to register a transfer of shares to a non-grower. The constitution also prevents shares being issued to non-growers. These provisions clearly restrict the ability of Zespri to raise capital from non-growers. And even if Zespri was able to raise capital from non-growers, it would face the same tensions that Fonterra was grappling with during its (unfulfilled) capital restructuring exercise, being the need to somehow identify a "market price" for the input (raw milk in Fonterra's case, kiwifruit in Zespri's). In the absence of competitive benchmarks, some sort of administrative pricing mechanism would be required.

Thirdly, Zespri's monopoly position is very likely to reduce the incentives on other firms to invest in kiwifruit R&D in New Zealand. This is because Zespri effectively controls access to the markets, making it difficult for other firms to commercialize their upstream R&D investments, and to appropriate the full economic rents from successful innovative products.

In this regard, the importance of vertical coordination in agriculture and horticulture should be noted. The Centre for International Economics in its 2002 review of the single desk for sugar marketing in Queensland states that (pp.31-32):[40]

> *In most industries there are proven economic gains derived from closely integrating and coordinating production, processing, storage, handling, transport and marketing along the value chain. Such integration allows competing organisations within an industry*

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[36] See, e.g., Aghion, Philippe, Nick Bloom, Richard Blundell, Rachel Griffith and Peter Howitt (2005) "Competition and Innovation: An Inverted U-Relationship", *The Quarterly Journal of Economics*, 701-728.

[37] In the real world, perfect competition is not a market structure readily observed.

[38] See Katz, Michael L and Howard A Shelanski (2007) "Mergers and Innovation", *Antitrust Law Journal*, 74(1), 1-86.

[39] Richards, Timothy and Mark Manfredo (2003), "Cooperative Mergers and Acquisitions: The Role of Capital Constraints", *Journal of Agricultural and Resource Economics*, 28(1), 152-168.

[40] Centre for International Economics (2002), "Cleaning up the Act: The Impacts of Changes to the Sugar Industry Act 1999", Report prepared for State Development Queensland.

> *more scope to differentiate themselves from one another and to capture the gains from small but cumulative product and marketing innovations. Without such integration, the scope for product innovation at any one stage is much more restrictive.*

The Productivity Commission (2000, p.50) makes a similar point, noting that the importance of supply chain relationships in producing food products increased significantly in the 1990s, but that "the compulsory interception by a marketing authority in supplier-customer relationships is likely to have increasingly detrimental impacts on market outcomes".[41]

[41] Productivity Commission (2000), *Single-desk Marketing: Assessing the Economic Arguments*, Productivity Commission Staff Research Paper, AusInfo, Canberra.

5. Quantification of Potential Benefits

5.1. Introduction

In the remainder of this report, we develop some extremely indicative metrics to provide a "feel" for the magnitude of the potential productive and dynamic efficiency benefits of deregulation of Zespri. We emphasise that to this point we have not undertaken any rigorous empirical analysis to determine these benefits, and that our calculations are rough approximations. Nonetheless, the metrics we calculate do provide a rough estimate of the magnitude of the benefits that are at stake.

We have not estimated the offsetting costs of deregulation, but in light of our discussion regarding international markets and market power, and the Gold kiwifruit premium in section 2, and the literature review in section 3, our view is that the dynamic benefits of deregulation are likely to materially exceed any credible estimate of the costs.

5.2. Productive efficiency gains

As explained above, the economics literature finds that competitive pressure improves productive efficiency. Introducing competition into the kiwifruit industry in New Zealand would result in Zespri having to compete for growers, which would provide it with sharper incentives to reduce its costs. In addition, growers would be better placed to benchmark Zespri's performance, in much the same way that dairy farmers can now compare the payout between Fonterra, Westland and Tatua.

In this section we apply some empirical estimates of improvements in productive efficiency to give a very approximate estimate of the expected gains that might be achieved following deregulation of Zespri.

There are numerous empirical studies in the economics literature that estimate the annual percentage improvement in productivity as a result of introducing competition. For example, Nickell (1996) finds that an increase in competition in the UK manufacturing sector can increase a firm's total factor productivity growth by between 3.8 and 4.6 percentage points.[42] That is if, absent competition, a firm's productivity growth per annum is static, by introducing competition its productivity will grow by 3.8 to 4.6 percent per annum.

The Commerce Commission has also used estimates of the impact of competition on productive efficiency. The Commission suggested that the impact of local loop unbundling in telecommunications would lead to improved productive efficiency of approximately 2.5 percent per annum.[43] In its decision regarding the authorisation of a strategic alliance between Qantas and Air New Zealand,[44] the Commission estimated that productive

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[42] Nickell, Stephen (1996), "Competition and Corporate Performance", *Journal of Political Economy*, 104(4), 724-746.

[43] Commerce Commission (2003), "Investigation into Unbundling the Local Loop Network and Fixed Public Data Network", Final Report.

[44] Commerce Commission (2003), *Decision 511*.

inefficiency arising from the lessening of competition would be in the range of 1-5 percent of the merged alliance's operating costs.

We are cautious in applying a particular productive efficiency figure from any one study, as the gains are likely to be very dependent on industry characteristics, and the specific factual and counterfactual governance arrangements. However a figure of 2.5 percent of operating costs would be consistent with the results quoted above, and conservative. Nonetheless, we note that Zespri currently faces competition in the offshore output market, and this competition would remain following deregulation. Thus the productive efficiency gains from deregulation may be reduced to some extent. To reflect this we take half of the 2.5 percent figure, and apply 1.25 percent of operating costs as estimated productivity gains.

Zespri's 2008 operating expenses are recorded as $1.14b, although this includes costs associated with payments to growers.[45] Removing these costs gives operating expenses of $421m. Applying 1.25 percent to this yields annual productive efficiency gains of $5.3m.

5.3. Dynamic efficiency gains

As previously discussed, we would expect that deregulation of the Zespri monopoly would create considerable dynamic efficiency gains from the resulting increased incentives (and ability) for investment and innovation. The gains might come from the introduction of new varieties, identification of new markets, improvements in product processes (e.g., to generate higher yielding crops), or improvements in supply-chain management processes. For quantification purposes, we have focussed only on new varieties at this stage.

In Figure 2.1 above we showed that there is a difference in the orchard gate returns per tray for Gold kiwifruit versus green kiwifruit. This difference reflects the price premium that can be obtained from successful innovation, and thus it is a crude (and conservative) measure of the producer surplus gains from innovation.[46] The total value of the price premium due to innovation is calculated by multiplying the per tray price premium by the number of trays of Gold kiwifruit supplied by growers. We have performed this calculation for each year from the 2000/01 kiwifruit season, when the Gold kiwifruit was introduced onto the international market, to the 2008/09 season. We have compounded up the dynamic efficiency gains in each year to 2008/09 using an assumed pre-tax nominal discount rate of 10 percent. The result is that the present value of dynamic efficiency gains attributable to growers since introducing the new cultivar in 2000/01 through to the most recent 2008/09 season is $206.9m.

Further dynamic efficiency benefits will accrue to growers in the future. Given the apparent durability of the price premium that has opened up, we would expect further dynamic efficiency benefits to accrue to growers in the future. If we assume that the Gold price premium and number of trays of Gold supplied remain constant at 2008/09 levels for 10 years,

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[45] Zespri Annual Report 2007/08.

[46] Assuming similar forward-looking costs of production between Gold and green kiwifruit, which is consistent with the cost estimates provided to us by Turners & Growers and as noted in section 2, it may even be that forward-looking production costs are lower for Gold than green kiwifruit. The annual rents would of course be partly used to fund R&D costs. We have not analysed the probability of successful innovation.

then using the same approach outlined above we calculate the present value of the future annual dynamic efficiency benefits of Gold kiwifruit attributable to growers until 2019 as $239.2m (discounted to 2008/09 using a 10 percent discount rate).

This result varies depending on the assumed future price premium. Assuming the Gold price premium for the next 10 years is equal to its average level since 2000/01 ($1.29 per tray), the present value of the future annual dynamic efficiency gains is $178.5m. However, this average price premium may be lower than would be expected in the next 10 years due to the lower premiums in the first years of sales of Gold, perhaps due to specials used to promote the variety. If instead we use an average Gold price premium for the last five years (of $1.47 per tray), the present value of the future annual dynamic efficiency gains is $203.2m. While there is thus some variability in our result depending on the assumed price premium, it seems reasonable to conclude that the present value of the future annual dynamic efficiency gains is approximately $200m.