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Evaluation of New Zealand's regulatory framework to support the reputation of horticultural commodity exports

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Evaluation of New Zealand's regulatory framework to support the reputation of horticultural commodity exports

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Key words: export market coordination, minimum quality standards, reputation, the New Zealand Horticulture Export Authority Act 1987, the HEA Act

Introduction

This paper discusses the economic rationale for government intervention in the export marketing of horticultural commodities. It argues that as well as observable characteristics, horticultural commodities possess unobservable characteristics that are valued by consumers. This can make it difficult for consumers to tell the difference between high-quality and low-quality product.

Suppliers can use their reputation, or in some cases their collective reputation, to communicate information to consumers about these unobservable characteristics. In an unregulated environment, suppliers face incentives to exploit this collective reputation by selling lower quality goods. This behaviour ultimately reduces buyers' willingness to pay, and reduces returns to the industry in general.

The New Zealand Horticulture Export Authority Act 1987 (the HEA Act) is one framework that addresses this problem by enabling the New Zealand horticultural based industries to apply enforceable requirements for exporting (which may include minimum export quality standards) and assist coordination in their export marketing. The HEA model falls between the free-market model where anyone can export any grade of a commodity to any market, and the single desk model where one exporter controls all exports of a commodity to all markets.

This paper develops objectives and criteria for evaluating the HEA Act framework based on effectiveness, efficiency and equity. This paper then evaluates the HEA Act framework to determine whether the framework is delivering on these objectives. Issues of unobservable characteristics, asymmetric information and collective reputation are common across the primary sector industries. The theoretical framework and analysis of the HEA Act framework presented in this paper may provide some guidance on addressing these issues in other primary sector export industries.

¹ The views expressed in this paper are those of the authors, not official views of the Ministry for Primary Industries.

Theoretical framework

This section discusses the economic rationale for government intervention in the export marketing of horticultural commodities.

Reputation is an important determinant of demand for horticultural commodities

The utility that consumers derive from a good depends on the ‘bundle’ of characteristics that comprise it (Lancaster, 1966). Consumers make trade-offs between these characteristics, choosing bundles that maximize their utility.

Horticultural commodities possess some characteristics that are unobservable to consumers, yet still valued by them. Some of these characteristics can be ascertained upon consumption (as in experience goods). Other characteristics are difficult for consumers to perceive even after consumption (as in post-experience goods).

Food products are often thought of as experience goods (Winfrey & McCluskey, 2005). For example, one apple may appear similar to another, but may vary in its quality including flavour and texture. The cost of acquiring information about the quality of an experience good is large relative to its price so it is relatively easier for a consumer to test the quality through consumption (Nelson, 1970). When considering whether to buy an experience good, consumers rely on the reputation of the supplier to give them information about the quality of the good (Winfrey & McCluskey, 2005).

Reputation is an important determinant of price for experience goods. Using data from Bordeaux wines, Ali and Nauges (Ali & Nauges, 2007) show that a producer’s pricing behaviour depends to a large extent on their reputation. For example, producers with a reputation for producing high quality wines tend to set and attract higher prices. In another study of Bordeaux wines, Landon (Landon & Smith, 1998) finds that reputation has a much greater effect on price than the current product’s quality.

Horticultural products also have many features of post-experience goods. Post-experience goods also have characteristics valued by consumers, but difficult for them to measure even after consumption (Darby & Karni, 1973). For example, one apple may appear similar to another but may be produced using more ethical production methods, may have stronger environmental credentials, and lower pesticide residue levels. Reputation and/or third party assurances are important for credibly communicating these features to consumers (Baksi & Bose, 2007).

Other primary sector products also have characteristics of experience and post-experience goods. The genetic modification status of agricultural crops and the sustainable management of fishing stocks are recognised as primary sector examples of post-experience characteristics (Baksi & Bose, 2007).

Collective reputation is important for commodity exporters and growers

Producers typically try to communicate information about their reputation and the characteristics of a product through branding or labelling. But individual branding/labelling is usually not a cost-effective option for small independent growers and exporters of homogeneous commodities that lack economies of scale.

Rather than the reputation of the firm, information about a product's characteristics can be conveyed through the collective reputation of the relevant producer group, cooperative, or consortia that promote the particular product (Landon & Smith, 1998). This also applies to products from a particular geographic location (Quagrainie, McCluskey, & Loureiro, 2003; Winfree & McCluskey, 2005).

Collective reputation depends on past average quality and is dynamic, that is, it can change over time. Dynamic collective reputation has been recognised as a common property resource problem (Winfree & McCluskey, 2005). Common property resources are ones that display characteristics of rivalry and non-excludability. Rivalrous consumption means that what one consumes cannot be consumed by another. Excludable ownership means that one has control over the use of the good (Weimer & Vining, 1998). This paper considers that collective reputation exhibits characteristics of both non-rivalry (because one exporter making use of the collective reputation does not prevent others from doing so) and non-excludability (because it is difficult to prevent other exporters from making use of, or benefitting from the collective reputation).

In an unregulated environment, exporters face incentives to exploit the collective reputation of a commodity, reducing returns to the industry

Horticultural products possess some characteristics of experience and post-experience goods, so it is difficult for consumers to accurately assess their quality before and sometimes even after consumption. For these kinds of products, sellers have more information about the quality of their products than the buyers do. George Akerlof (Akerlof, 1970) argued that information asymmetry can be expected to lead to poor quality products driving high quality products out of the market: the market for lemons problem.

Some horticultural exporters may be incentivised to exploit consumers' lack of information by selling lower quality product which may lead to increased variability and consumer dissatisfaction in the product offering resulting in the withdrawal of high quality products from the market (or weak sales volumes eroding values). This decrease in higher quality product would reduce average quality and undermine the product's reputation. This could be expected to reduce buyers' willingness to pay the stated price. This in-turn may incentivise sellers of moderate quality produce to withdraw from the market and further undermine the product's reputation, and so on.

Provision of high quality product can follow a cyclic pattern as producers seek to 'extract' value from their reputation by providing lower quality product at high prices (Gale & Rosenthal, 1994).

In an unregulated environment, there is an incentive for commodity exporters to compete against each other on price (to effect a sale) by relaxing their quality standards. As the number of firms in the relevant producer group increases, the incentive to extract value from the collective reputation increases and so the incentive to provide high quality product decreases (Winfree & McCluskey, 2005). Reputational damage occurs where producers supply product of a quality that is below customer expectations.

A New Zealand solution to the reputation problem for horticultural commodities

The late 1970s and early 1980s was a period of rapid expansion and diversification in the horticultural sector. This led to the establishment of industry organisations and planning groups to deal with individual horticultural products (MacIntyre, 1983). Apple (since 1948) and kiwifruit (since 1977) industries had their own industry-specific regulatory provisions. The industries outside of apples and kiwifruit sought a central co-ordinating authority.

In the year to June 1975, the total value of fresh fruit and vegetable exports was \$26.1 million. Export values increased to \$352.4 million in 1985, giving an average annual growth of around 30 percent. Table 1 shows that while apples and kiwifruit dominated horticultural exports, exports of other horticultural products also expanded in the late 1970s and early 1980s.

Table 1: Growth of New Zealand horticulture sector by value of fresh exports NZ\$ million FOB ²					
	1975	1985	1995	2005	2012
Apples	19.3	108.2	343.6	387.0	341.6
Kiwifruit	2.9	171.9	320.8	720.2	1045.7
Other fruits	0.8	28.4	57.6	80.5	172.6
Vegetables	3.1	43.9	200.1	200.0	213.3
Total	26.1	352.4	922.1	1387.7	1773.2

(PFR, 2012) and Statistics New Zealand (2013)

In the early 1980's the New Zealand Government identified that a major factor restraining the growth of export returns from horticulture was uncoordinated marketing and lack of ability for growers and exporters to match their products with consumer requirements. The inability of horticulture industries to cope with boom and bust cycles was also a concern for the Government.

In December 1983 the Government introduced the Horticulture Export Authority (HEA) Bill in Parliament after a request from the horticulture based industries. This was enacted four years later in 1987 as the New Zealand Horticulture Export Authority Act. The industry's request was on the grounds that a body with statutory powers was needed to co-ordinate and control, through the licensing of exporters, the export marketing of horticultural produce to get the best possible returns for the producer and to prevent any irresponsible exporter from jeopardising recently developed markets (MacIntyre, 1983).

² Year ended 30 June.

Dismantling of marketing regulations in a number of industries commenced in the mid-1980s. However, the Government agreed to introduce new marketing regulations for the horticultural based industries because it considered that a regulated framework would introduce structure, discipline and coordination for these industries.

Key features of the HEA Act framework

The HEA Act framework falls between the free-market model and the single-desk export models.

The HEA Act framework enables growers, pack-house operators and exporters to work together through their membership of product groups. The product groups:

- formulate the export marketing strategies for their own industries;
- are consulted by the HEA when it considers an export licence application; and
- assist the HEA in implementing the export marketing strategies.

The HEA Act is an enabling legislation with a flexible framework, as the individual sectors decide:

- whether to come under the ambit of the HEA Act framework³ (once inside the framework and when a licensing regime is operational the full provisions of the HEA Act apply);
- on the contents of their export marketing strategy that underpins export licensing; and
- how long to remain under the HEA Act framework.

The HEA Act is not a single-desk export framework, as:

- the HEA, or any of the product groups do not have the power to buy and sell the products themselves; and
- there is no ability to impose volume limits or restrict the number of exporters to any particular market or markets.

Box 1: HEA Act framework facts and figures

There are currently 11 product groups under the HEA Act framework⁴. In the year ending June 2012, around \$264 million worth of horticultural products were exported under the HEA framework. This represents around 15 percent of the value of fresh horticultural exports in 2012⁵.

³ To come under the ambit of the HEA Act product groups must make an application to the Minister for Primary Industries, providing evidence that the industry supports coming under the HEA Act framework. This could be demonstrated, for example, through a vote at a referendum or annual general meeting.

⁴ Avocado, Blackcurrants, Buttercup Squash, Chestnuts, Kiwifruit to Australia, Nashi Pears, Persimmon, Summerfruit, Tamarillo, and Truffles. Boysenberries, Nashi Pears, Chestnuts and Truffles have HEA Export Orders, but are not currently exporting products under the HEA framework.

⁵ The total value of fresh horticultural exports in the year ended June 2012 was \$1,773.2 million FOB. Fresh kiwifruit (including to Australia under the HEA) and apple exports accounted for 78 percent of this \$1,773.2 million (PFR, 2012).

Purpose of the HEA Act

The purpose of the HEA Act is to promote effective export marketing of horticultural products. It does this by providing sectors a voluntary structure within which they can set minimum quality standards and co-ordinate their marketing and ongoing sector development (MPI, 2012).

In New Zealand, horticultural commodity exports are not covered by other product-specific export legislation such as the Animal Products Act 1999 or the Wine Act 2003.

The HEA Act provides an exporting framework in which a commodity's reputation can be protected

This paper has established that in an unregulated market exporters face incentives to exploit a commodity's reputation in the short-term. The HEA Act framework protects the reputation of horticultural commodities by requiring exporters to be licensed and to act in accordance with a collaboratively produced export marketing strategy (EMS) containing a combination of minimum quality standards, food safety programme, information collation and market development initiatives. This gives growers some control and influence over exporter behaviour and enables them to protect the reputation of their product, and their long-term returns.

A number of authors suggest that minimum quality standards can be an effective way to protect product reputation. Ledbury (Ledbury, Miller, Lee, Fairman, & Clifton, 2006) considered that setting standards could be one solution to address asymmetries in information. Quagrainie (Quagrainie et al., 2003) has suggested, in the case of the collective reputation of apples from Washington (USA), there may be justification for minimum quality standards. Using a market model approach, Bockstael (Bockstael, 1984) shows that minimum quality standards are likely to benefit producers, and cost consumers. The net benefit is found to be negative only where consumers can perceive quality before purchase. This suggests that the case for the market failure considered in this paper is strongest where minimum quality standards are targeted at experience and post-experience characteristics.

Export marketing strategies for New Zealand horticultural products often cover post-experience characteristics such as pesticide residue levels, and experience characteristics such as sweetness (cherries) and proportion of dry matter (avocados and kiwifruit).

Box 2: The structure of the New Zealand horticulture commodity sector

Horticulture-based export industries have three major components within New Zealand in their production-marketing chain; a large number of small-scale independent growers, a small number of large-scale independent packhouse operators, and a number of exporters of varying size.

Growers are generally New Zealand based land-owner farmers, usually small family-run businesses, committed to fruit and vegetable production.

There are barriers to entry and exit into fruit and vegetable growing such as the requirement for land, capital investment and the time needed to establish an orchard. As such, growers may have a longer-term stake in the future of the industry and benefit or bear most of the costs of reputation of their produce in the markets.

Most packhouses have multiple owners and they usually pack more than one horticultural commodity. While they also have higher investment stakes in the industry, they are service providers and do not take ownership of the commodity. Growers usually have a limited number of packhouses they can use. This paper argues that, overall, packhouses' stakes in the reputation of a particular commodity are not as high as those of its growers.

Some of the larger exporters export more than one commodity. With respect to each commodity, exporters face fewer barriers to entry and exit, and they can switch between commodities more easily than growers. As such, exporters have a lesser stake in the reputation of a particular commodity than its growers and are likely to have greater opportunities and incentives to exploit and undermine a product's collective reputation for short-term gain.

Criteria for evaluating the regulatory framework for export marketing

This section sets out objectives and criteria for evaluating the HEA Act framework against the free-market structure. The objectives of effectiveness, efficiency and equity were chosen, based loosely on those used by Weimer and Vining (Weimer & Vining, 1998). The objectives and criteria draw on those used by Narayan and Rutherford (Narayan & Rutherford, 2012) and give consideration to the New Zealand Government's best practice regulation principles (Treasury, 2009).

Effectiveness

In this paper the HEA Act framework is evaluated for effectiveness on the basis of the protection provided to the collective reputation of New Zealand horticultural commodities in export markets, and industry coordination in export marketing and market development.

Protection of collective reputation

Criteria: Is the HEA Act framework effective at protecting the reputation of New Zealand horticultural commodities in export markets?

This paper considers that the main objective of the HEA Act framework is to protect the collective reputation of New Zealand horticultural commodities in export markets. This paper uses growth in export value over time, and views of product groups and their behaviour, to provide an indication of whether the HEA Act framework protects the reputation of export horticultural commodities.

Industry coordination and market development

Criteria: Does the HEA Act framework promote the effective coordination of marketing and market development activities in export markets?

This paper considers that another objective of the HEA Act framework is to facilitate improved coordination of marketing and market development activities and sharing of market information. Marketing behaviour of product groups could demonstrate whether the HEA Act framework enables the product groups to coordinate their export marketing.

Efficiency

In this paper the HEA Act framework is evaluated for efficiency on the basis of the cost effectiveness of marketing and market development including impacts on industry supply chain efficiency and innovation.

Marketing efficiency

Criteria: Does the HEA Act framework promote efficiencies in market development and promotion?

The HEA Act framework may enable cost savings in marketing and promotion. The HEA Act framework allows branding and marketing functions to be done at the product group level, which could be expected to save individual growers and exporters from doing them individually, reducing overall costs to the industry. This could be measured by comparing average marketing and promotion costs of firms under the HEA Act framework, with unregulated firms. Individual product group behaviour in terms of the group's in-market activities could also demonstrate whether the HEA Act framework promotes efficiencies in market development and promotion.

The direct cost of running the HEA system is also an indication of cost effectiveness in marketing and market development. The HEA's administration costs are incorporated into licence fees which are monitored, and reported on in the HEA's annual report each year.

Impact on supply chain efficiency and innovation

Criteria: Impacts on industry efficiency and encouraging innovation

The introduction of minimum quality standards and associated fees could be expected to reduce competition between New Zealand exporters in the export markets. This could increase returns to New Zealand producers, but may also result in reduced supply chain efficiency and innovation. Supply chain efficiency could be monitored through the relative increase in yield per hectare over time for products in the free-market compared to products under the HEA Act framework.

Innovation in the wholesale fruit and vegetable market could be monitored for example through the development and release of new cultivars and varieties, new innovative production techniques, and developing technologies to increase shelf-life of products.

Equity

In this paper the HEA Act framework is evaluated for equity on the basis of the distribution of costs and benefits to affected parties, in this case growers and exporters.

Criteria: Grower protection versus commercial freedom

Through licensing of exporters the HEA Act framework is expected to provide growers some protection from potential short-term exploitative behaviour of exporters. However, this also exposes potential downsides of the HEA Act framework; that it constrains the way growers, packhouses and particularly exporters can run their businesses and limits their commercial opportunities.

The impact of the HEA Act framework on protection of growers' interests, and on the economic freedom of exporters, could be measured by surveying the views of industry participants.

Evaluating the HEA Act regulatory framework for export marketing

This section of the paper uses the set of evaluation criteria discussed above to evaluate the HEA Act framework. It has been challenging to find the right data to quantitatively evaluate whether the HEA is effective, efficient, and equitable. Therefore, this paper predominantly uses qualitative measures.

Criteria: Is the HEA Act framework effective at protecting the reputation of New Zealand horticultural commodities in export markets?

The HEA Act requires that exporters be licensed and follow the export marketing strategy, which sets minimum quality standards that exported produce must meet. This could be expected to protect the reputation of New Zealand horticultural commodities as exporters must meet the specified minimum quality standards.

Since 2000 only one product group, table grapes, has left the HEA Act framework.⁶ This is an indication that growers and exporters value the HEA Act framework and consider it to be beneficial to their industries. The table grapes industry exited from the HEA Act framework when its export sector had consolidated quite considerably, down to fewer than ten export growers and two exporters. At the time of exit, the table grapes industry considered it no longer required legislation to achieve coordination in export marketing.

⁶ Two other industries have suspended their export licensing provision because of declining export returns. They both have decided to retain their HEA Order so that they can use the provisions of the HEA Act as export volumes rise.

The industry also acknowledged it could not compete with other exporting countries (Australia, Chile and South Africa) in supplying export markets cost effectively.

The HEA Act requires that the HEA's performance is reviewed every five years, it was last reviewed in 2009. Like previous reviewers, the 2009 reviewer interviewed product group participants, exporters, government agencies and other independent parties that work with horticulture industry stakeholders. Like previous reviewers, the 2009 reviewer concluded in his report that:

'the HEA has made, and is making, a significant contribution to the export performance of the horticulture sector.' (Walter, 2009)

Industry participants gave similar support to the HEA Act framework in response to the Ministry for Primary Industries' (MPI's) 2012/13 consultation as part of its review of the HEA Act. MPI received a number of submissions on its discussion document 'Review of the Horticulture Export Authority Act'. Most submitters expressed strong support for the HEA Act framework. As an example, the key grower representative body, Horticulture New Zealand, submitted that:

'HortNZ's view is that the HEA Act provides a very valuable structure that has in the past and continues today to add value to our horticulture exports.'

As well as qualitative evidence this paper examined the annual export values for the main export products under the HEA Act framework and one industry outside the HEA Act framework to assess trends for those industries. The results are presented below.

Figure 1 shows the annual export earnings from four of the largest product groups under the HEA Act framework and for onions which is a non-HEA Act product. Products, both within and outside the HEA Act framework, experienced considerable growth in export values in their initial development stages.

In the case of onions, there were significant fluctuations in export value following the industry's early growth. For HEA products the fluctuations appear to occur to a lesser extent, apart from avocados that show annual fluctuations due to its biennial production nature (i.e. yield is high every other year). This may indicate that the HEA Act framework has had some success in smoothing boom and bust cycles for horticultural industries.

Figure 1: Annual exports NZ\$ million FOB⁷

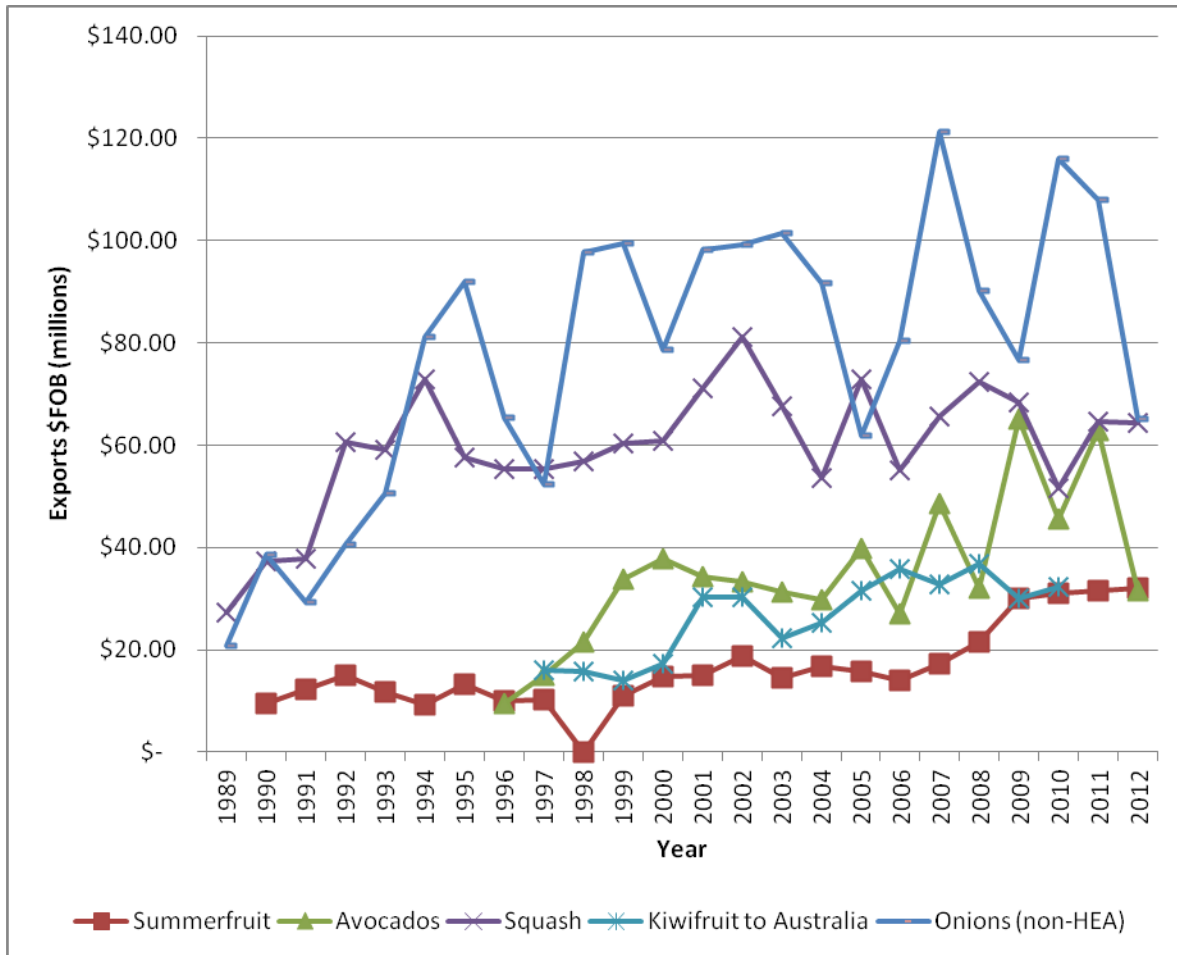


Figure 2 below compares the aggregate annual export earnings of three of the HEA regulated products in Figure 1 (summerfruit, avocados and squash), with the annual export returns from kiwifruit, which are regulated under the single-desk model, and apples, which are now unregulated (unregulated since 2001).

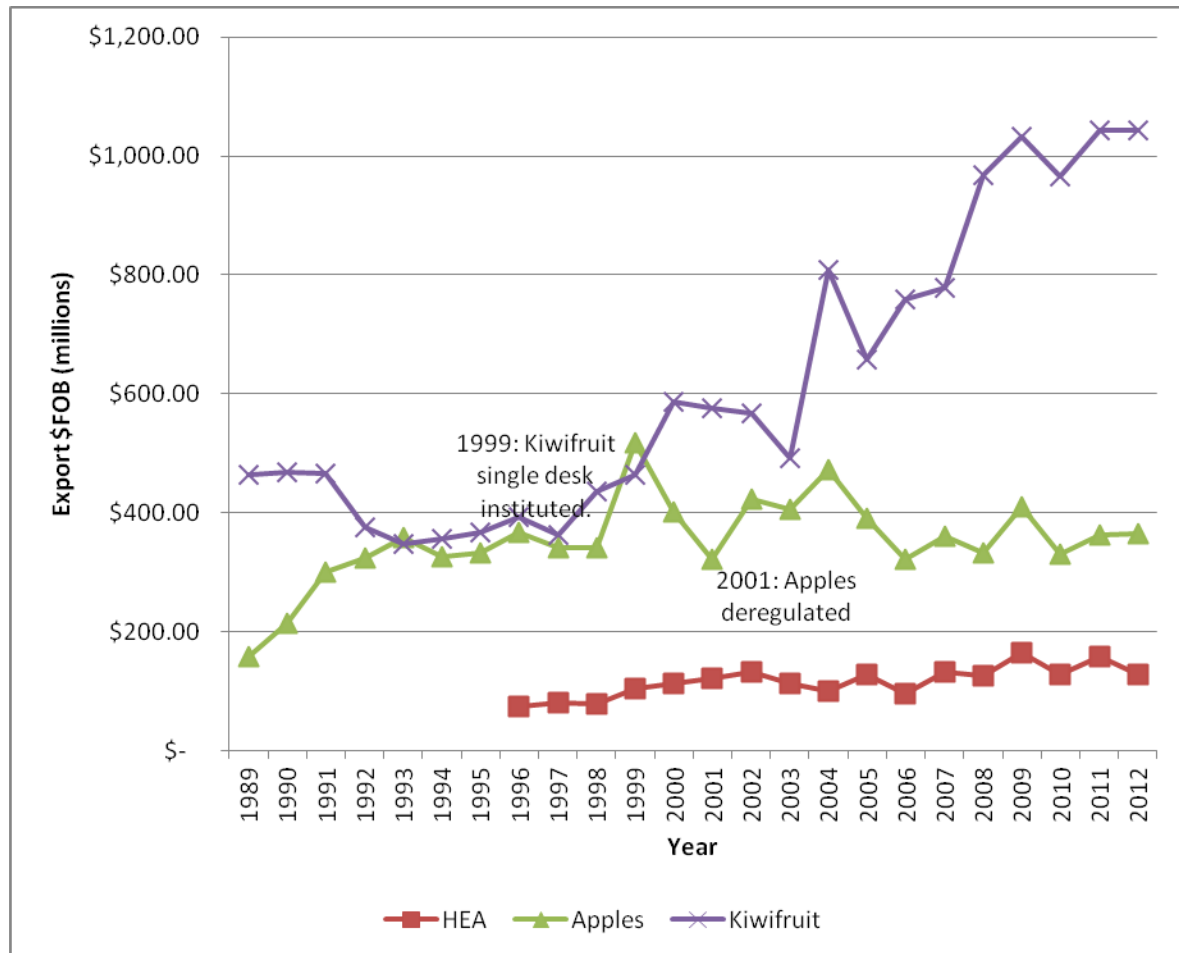
It is difficult to infer much from the limited information here. However, it is clear that the kiwifruit industry, under the single-desk model, has experienced the greatest growth in export returns. Since the current single-desk arrangement was put in place in 1999 the kiwifruit industry has grown at an annual rate of 6.43 percent⁸.

⁷ Squash and Avocados have the largest export earnings from all HEA regulated products. Summerfruit is an aggregate of cherries, apricots, nectarines, peaches and plums. The recent increase in summerfruit exports has been driven by significant increases in export earnings from cherries. Kiwifruit to Australia is a special case where HEA rules are applied only to kiwifruit exported to that market, all other kiwifruit exports are regulated under the single desk arrangement provided by the Kiwifruit Export Regulations 1999.

⁸ The high growth rate may also reflect the ability of the single-desk structure to exploit plant variety rights granted in 1995 over the popular gold (Hort16A) kiwifruit variety.

The apple industry experienced significant growth in the early 1990's under its single-desk structure but since then has been relatively steady in terms of total export value, growing at 1.14 percent annually.

Figure 2: Annual exports NZ\$ million FOB – comparison of HEA, unregulated and single-desk models



The annual growth of the export value of products under the HEA framework falls between kiwifruit under single-desk and unregulated apple exports with a rate of 3.42 percent annually. This suggests that the HEA Act framework has been somewhat effective in protecting the collective reputation of New Zealand horticultural commodities in export markets. Although it must be noted that aggregate export returns do not always reflect the returns to growers.

Criteria: Does the HEA Act framework promote the effective coordination of marketing and market development activities in export markets?

The HEA Act framework provides the product group the ability to coordinate its exports to be able to increase returns to New Zealand growers, and maintain the market for long term industry prosperity.

Using the avocado industry as an example, the Avocado Industry Council product group under the HEA Act framework was able to successfully manage the industry's key market in the 2011/12 season⁹. Both Australian and New Zealand avocado production was particularly high over that season. The Council set a voluntary target for New Zealand exporters to place 25 percent of their exports outside the Australian market to avoid oversupply (NZAGA, 2012). Although the Council was frustrated that the HEA Act did not allow them to enforce the target, there was some success with 19 percent of the New Zealand harvest exported to markets outside Australia. This shows that the HEA Act framework provides the opportunity to better coordinate export marketing.

Another recent example of exporter collaboration fostered by the HEA Act framework is the success of the recent AVANZATM model which saw three exporters cooperate to sell avocados under one brand in Asia.

After being deregulated in 2001, the New Zealand apple industry slipped from 7th to 14th most competitive in the marketing subcategory in the ten years from 2003 to 2013 (Belrose, 2003, 2013). In 1995 while still regulated, the industry was given a high ranking of 1st (Innomarc, 2006). This change reflects the efforts under the single-desk structure prior to the industry deregulation in 2001 and the uncoordinated efforts of around 90 competing exporters in the free-market era post-deregulation. This suggests that a regulated framework is more effective for coordination of marketing and performance for horticultural commodities than a free-market environment.

Criteria: Does the HEA Act framework promote efficiencies in market development and promotion?

As many of the individual players in the industry (growers, packhouses and exporters) are small, they may lack the scale to efficiently promote and market their products individually. Each exporter would have to spend money on market development activities, rather than funding these collectively as the HEA Act framework allows. Therefore, the HEA Act framework could be expected to reduce inefficient duplication and enable economies of scale in market promotion for New Zealand exporters¹⁰.

The costs of the HEA's activities are incorporated into fees on producers and exporters. Product Group fees for 2012 were \$216,256 and Export Licence fees were \$133,880, totalling \$375,136 (HEA, 2012). This equates to around 0.1 percent of annual total value of product exported under the HEA, which was \$264.6 million FOB in the year to June 2012.

Criteria: Impacts on industry efficiency and encouraging innovation

While market coordination under the HEA Act framework may be useful for small horticultural industries, one of the largest horticultural industries, the apple industry, may have benefitted in some ways from operating in a deregulated environment.

⁹ Although returns to growers were poor in this season.

¹⁰ The Commodity Levies Act 1990 enables producers to collaborate in marketing and promotion activities. The HEA Act framework enables exporters (and growers) to do the same.

For example, there has been significant increase in plantings and exports of a range of new apple varieties, giving a greater marketing choice to the industry and ability for some to benefit from marketing patent and plant variety right protected varieties.

There has been significant consolidation in apple orchards registered for export production, from 920 orchards in 2005 to 391 orchards in 2012 (a decline of 57 percent). This has led to fewer, larger orchards. Growers exiting the industry typically lease their orchards to larger growers, or to vertically integrated businesses. This paper estimates that vertically integrated businesses currently account for at least 50 percent of export apple production. This has given the industry greater control of its production costs and greater control in the marketing of their products. From 2003 to 2013 after deregulation New Zealand's apple industry has gone from 5th to 1st ranked in terms of production efficiency (Belrose, 2003, 2013).

However, industry rationalisation has also occurred within some of the HEA regulated industries. For example, considerable consolidation has occurred across the board in the squash industry, with the most pronounced being the drop in number of registered growers, declining from 151 growers in the 1997/98 season to 50 growers in the 2010/11 season. Similarly, the number of packhouse operators declined from 30 to 13 over the same period. The big growers are getting bigger and the top few are totally vertically integrated i.e. grower/packer/exporter. Growers have become more efficient by necessity with yields achieved through varietal choices and better agronomy practices on farm including better use of GPS technology. Where a pack out of 85 percent would have been acceptable 10 years ago, now some are guaranteeing 100 percent pack out.

Criteria: Grower protection versus commercial freedom

There are more rules for industry participants to follow under the HEA Act framework than in a free-market system. Some industry participants express frustration at this. For example, in the recent MPI consultation for the HEA Act review, one respondent remarked:

'I have seen exporters within HEA product groups try to get others exporters expelled from HEA product groups under the "guise of exporter bad behaviour" for their own commercial benefit (If an exporter is expelled then other exporters will gain market share). This is the wrong use of HEA.'

The current HEA Act framework does not enable an industry to take the opportunity to sell lower quality products to lower value markets that cannot afford the higher quality prescribed in that product's export marketing strategy. Instead the grower may have to send the produce to a low value activity like juicing or leaving it on the trees. Once harvested, there is a sunk cost that the grower may like to recover.

The 'one-size-fits-all' approach under the current HEA Act may not encourage a grower to produce at a quality much higher than the prescribed minimum quality standard to target some niche high-end markets. However, the HEA Act framework does not prevent an exporter to use own brand for niche marketing.

Summary

Table 2: Summary of HEA Act Evaluation		
Goal	Criteria	Key findings
Effectiveness	Protection of collective reputation in export markets	<ul style="list-style-type: none"> • Only one product group has left HEA Act framework since 2000, an indication that industry participants consider the framework is delivering on this criteria • Industry participants have expressed strong support through the 2009 performance review and 2012 consultation for review of the HEA Act • Export data suggests that the HEA Act framework may contribute to smoothing of boom and bust cycles
	Market coordination and development	<ul style="list-style-type: none"> • The avocado industry was able to divert some of its products from its key market in a season when production was high • Greater industry coordination has led to some avocado exporters selling under one brand • Apple industry has declined from being top ranked in competitiveness in marketing prior to deregulation to 14th in 2013 in a free-market environment
Efficiency	Efficiency in promotion and market development	<ul style="list-style-type: none"> • The HEA Act framework provides for economies of scale in commodity promotion • HEA's licence fees are low, and represent 0.1 percent of the total value of products exported under the HEA Act framework
	Supply chain efficiency and innovation	<ul style="list-style-type: none"> • The deregulation of the apple industry has showed significant industry consolidation, rationalisation and vertical integration, with the New Zealand apple industry moving from 5th in 2003 to 1st in 2013 in terms of production efficiency. However, some of the HEA industries, e.g. squash, have also gone through similar consolidation, rationalisation and vertical integration
Equity	Protection of growers' interests versus exporter freedom	<ul style="list-style-type: none"> • The HEA Act framework protects growers from potential short-term exploitative behaviour of exporters • The HEA Act framework limits commercial opportunities for growers and exporters

Conclusions

This paper argues that horticultural commodities possess unobservable characteristics that can make it difficult for buyers to tell the difference between high-quality and low-quality product. Suppliers can use the reputation of their product to communicate information about these unobservable characteristics. In some instances suppliers share a collective reputation. In an unregulated environment, suppliers face incentives to exploit the collective reputation by selling lower quality, lower cost goods. This behaviour ultimately reduces buyers' willingness to pay, and returns to the industry in general.

This paper has developed criteria to evaluate the effectiveness, efficiency and equity of the New Zealand HEA Act framework.

It has been challenging to find quantitative evidence that the HEA Act framework is meeting its objectives. However, the qualitative analysis in this paper suggests that the HEA Act framework has been effective at protecting the reputation of horticultural commodities in export markets and enabling horticultural industries to coordinate their export marketing. The analysis suggests that the HEA framework enables these industries to achieve economies of scale in marketing to more efficiently undertake market development and promotion. In terms of equity, while the HEA Act framework protects the interests of growers, it can potentially constrain some industry participants, particularly exporters, from using all the commercial opportunities available to them.

Issues of unobservable characteristics, asymmetric information and collective reputation are common across the primary industries. The theoretical framework and analysis of the HEA Act framework presented in this paper may provide some guidance on addressing these issues in other primary sector export industries.

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