The Impacts of a Co-operative versus a Private Monopsony Marketing Structure in Western Australia on the Wheat Grower

by

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ABSTRACT

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The Western Australian Co-operative Bulk Handling (CBH) has been described as a regional monopsony due to its control of the supply chain. Currently, CBH is a grower owned co-operative, however recently it has been considering altering its structure.

The objective of this study is to analyze price, quantity and welfare impacts on the Western Australian grower under a regime change for the CBH. Specifically, it considers the impacts to the Western Australian grower if their grower owned CBH co-operative was converted to a private firm with monopsony power.

The results from the theoretical model and simulations show the negative impacts on the Western Australian grower if CBH altered its structure to a privately held monopsony. This is not surprising as the best interests of the member growers is currently the focus of CBH, whereas in a non-grower owned structure, the interests of the shareholder take precedence.

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Chapter 1 Introduction

1.1 Background

Wheat is the major crop grown and exported in Australia. The Australian single-desk for wheat exports was removed July 1, 2008 - ending over 60 years of regulated wheat marketing in Australia through the Australian Wheat Board. The supply chain has begun to adapt to the new reality, but the transition from a single-desk system to an open market has only begun. The single desk has been replaced with a comprehensive set of government and industry regulations. Although roughly twenty six companies have been accredited to export Australian wheat, there are a few players that already have a substantial share of the market.

Although the bulk wheat export market is deregulated, in Western Australia, Co-operative Bulk Handling (CBH) has been described as a regional monopsony as it controls almost all of the up-country facilities and all four port terminals used for grain handling in Western Australia. Currently, CBH is a fully grower owned, co-operative, however recently it has been considering altering its structure. Other Australian grain marketing and handling organizations have altered their structures, transforming from grower owned co-operatives to private firms.

The evolution of these organizations is consistent with the co-operative life cycle theory which has successfully described and predicted the changes made to the other Australian grain handling and marketing organizations. As described by Chaddad and Cook (2004), “The rapid and fundamental structural changes occurring in the global food system—commonly referred to as agricultural industrialization—exposes agricultural co-

operatives to heightened domestic and international competition from other business forms. These changes also suggest that it is important to consider whether the organizational structures that have evolved in the past are likely to remain appropriate for the future. The success of agricultural co-operatives in responding to the challenges brought about by agricultural industrialization will likely depend on both competitive strategy and organizational structure."

1.2 Objective of the study

The objective of this study is to analyze price, quantity and welfare impacts on the Western Australian grower under a regime change for the CBH. Specifically, it will consider the impacts to the Western Australian grower if their grower owned CBH co-operative was converted to a private firm assuming significant market power given the current ownership of grain handling and port infrastructure.

1.3 Methodology

This study utilizes mathematical optimization of two types of objectives functions, one that assumes CBH's current objective is to maximize producer utility, otherwise stated as maximizing the combined profits of all growers and CBH together. The second approach is based on CBH altering its structure to a private entity, and as such, following the profit-maximizing behaviour of any other private player for the benefit of its shareholders, ignoring repercussions on grower returns.

1.4 Organization of the study

This study comprises nine chapters. This first chapter has introduced the study, identified the objective and described the methodology used in the model. The second chapter provides a history of the Australian wheat industry's transition from a single desk to an open market, and the resulting regulations. The third chapter provides an overview of the Australian wheat industry. The fourth chapter provides a history of CBH, describes its current supply chain, and discusses the first year of deregulation. The fifth chapter develops the idea of co-operative life cycles and the potential future for the CBH. The sixth chapter provides the detail of models that could be used to describe the Western Australia market structure. The seventh chapter provides the model and data points used in this study to analyze the implications of CBH altering its structure from a co-operative to private entity. The eighth chapter provides the results of the simulations of the theoretical model described in chapter seven and performs a welfare analysis. The final chapter concludes the study, including a summary of the results and a recommendation for the direction of CBH from the interests of a Western Australian grower.

Chapter 2 Deregulation History

The deregulation of the Australian bulk wheat export market provides the basis for this study. The following describes the Australian wheat industry's transition from a single desk to an open market, including an overview of the resulting regulations

2.1 Australian Wheat Board and the Single Desk

In 1939, the Australian Wheat Board (AWB) was established as a statutory authority to acquire and sell all wheat in Australia. As AWB only operated the marketing of wheat, it would rely on other grain players (ex. CBH) for the handling and storage of wheat. The transition from a single-desk to an open market for Australian wheat took place over the course of almost 30 years. By the late 1970s, there was pressure from some growers and industry for deregulation of the wheat industry. The Wheat Marketing Act 1984 contained changes to regulation, including the opportunity for feed buyers to trade directly with growers. Additional pressure for deregulation occurred in 1986 when the Australian Royal Commission concluded the government controlled or owned grain handling and transportation systems were not cost effective and efficient. This was exacerbated when in 1986/87, the AWB suffered a pool deficit and the government was required to support them. In 1989, the government deregulated the wheat industry further by removing the AWB's single desk on domestic wheat sales. At the same time, the Wheat Industry Fund was set up that allowed the AWB to amass capital and acquire infrastructure. In 1992, the government decided the Government guarantees on AWB's borrowings would end, however it did not set a date. Further reduction in government spending and involvement came in 1995 with the National Competition Policy (1995),

which was designed to enhance competition, reduce government industry involvement and remove activities deemed as protectionist. Following the policy, in 1996, the government announced growers would be responsible for their own financing beginning July 1999. AWB's transition from grower controlled entity to a publicly listed company began in 1997 with the implementation of a dual class share structure (growers and other interests). In 2008, AWB's constitution was amended and class A shares (held only by growers) were redeemed. The final push for full deregulation is considered to be the UN Oil for Food Inquiry (2006), where AWB received kickbacks to secure wheat sales to Iraq (Cockfield and Botterill 2007).

2.2 Open Market Regulations

Through the *Wheat Export Marketing Act 2008*, on July 1, 2008, the single desk powers of the AWB[1] were replaced by an open market for Australian bulk wheat exports. Also, through the Wheat Export Accreditation Scheme 2008, a new government agency, Wheat Exports Australia (WEA) was designated to provide accreditation to exporters. In the first year of deregulation, twenty-six wheat exporters were accredited by the WEA to export bulk wheat (WEA, 2009a). These accredited exporters include Australian based companies and traders that only market Australian grain, but also multinationals such as Cargill and Louis Dreyfus. These multinationals should have an advantage in place as they can source wheat from multiple locations and have a strong international reputation.

[1] At deregulation in 2008, AWB operated in seven business segments: Financial Services, Rural Services, Australian Commodity Management, International Commodity Management, Pool Management Services, Harvest Finance, Supply Chain and Other Investments. AWB operates in all five wheat producing states with involvement in all aspects of the supply chain. However it's only port facilities involvement is a 50 per cent share in Melbourne Port (AWB, 2010). Citigroup Australia discussed their biggest strengths as having rural services and strong working capital, however they are asset poor (Citigroup, 2008). Given that AWB was the sole marketer of wheat exports up until 2008, they also hold the advantage of customer relations already in place.

However, at the time of deregulation, three particular non-multinational Australian companies who received accreditation had a natural competitive advantage. GrainCorp, based in Eastern Australia, ABB, based in Southern Australia, and Co-operative Bulk Handling Group, based in Western Australia, already had almost complete control over the handling and storage in their respective regions through up-country grower delivery points and port terminals. With the reality that operators of port terminal facilities have natural monopsony characteristics in their regions, the Act also aims to ensure that port operators cannot use access to their facilities to inhibit competition from other companies. In order to satisfy the Australian Competition and Consumer Commission (ACCC), port operators must provide an access undertaking that:

- Makes economically efficient use of the asset and promotes competition in upstream and downstream markets.
- Provides a service that is priced so as to achieve a "fair" rate of return on the asset.
- Only uses differential pricing so as to aid efficiency, but not used to discriminate in favour of port operators downstream operations (except to the extent that it is cheaper than the cost of providing access to other operators).
- Only uses pricing regimes that provide incentives to reduce costs or otherwise improve efficiency (ProFarmer, 2009).

Port operators must also comply with "continuous disclosure rules", including publishing a daily shipping stem and protocols for port access.

The effectiveness of these access undertakings is being questioned. CBH argues that they should be dropped, arguing the money could be better spent on the supply chain. This is supported by the grain grower group Western Australia Farmers Federation (WAFF), as CBH is a grower-owned and controlled co-op. The Pastoralists and Graziers Association (PGA), the Australian Grain Exporters Association (AGEA) and the Victorian Farmers Federation (VFF) want restrictions on ports maintained and extended to up-country delivery points. According to the VFF, there is anecdotal evidence throughout the industry regarding actions taken by port operators to restrict movement of grain from up-country storages not in their control. The VFF is concerned that growers will be forced to deliver to particular up-country storage facilities and non-port operating marketers will be forced to use specific up-country facilities. The VFF believes the WEA doesn't have the authority to address potential problems and the ACCC processes are unworkable and may not provide timely relief in the event problems arise (Australia Productivity Commission, 2010a). During the 2009/10 marketing year, AWB accused the bulk handlers of using their market power by locking rival wheat companies out of their port and rail facilities.

In August 2009, the ACCC rejected the bulk handling agents' (CBH, ABB and GrainCorp) access arrangements submitted in April 2009. The ACCC provided feedback on how to revise the arrangements in order to be accepted, and advised that valid arrangements were required to be in place by October 1 2009, otherwise their accreditation to export wheat would expire. After October 1 2009, the bulk handling agents would likely have more administrative work as they would be required to go

through their respective state, which must then go through the National Competition Council to approve their port terminal access regime.

On September 24 2009, the ACCC once again rejected the arrangements of all three Bulk Handling Arrangements. For CBH, some of the issues included;

- CBH was required to publish a single set of prices for port services (some exceptions apply).
- It was also required to provide flexibility in operating its day-to-day operations without excessive oversight, as well as conduct these operations in a non-discriminatory basis.
- CBH already had ring fencing arrangements in place, due to the separation of its Grain Pool and Grain Express business units, however the ACCC determined it still does not serve as an effective safeguard against anti-competitive discrimination. They advised it should also contain fair access clauses, transparent port terminal protocols, as well as measures to deal with the possibility of Grain Pool to gain knowledge of the port terminal services and resulting competitive advantage (ACCC, 2009).

On September 29, the ACCC accepted CBH's revised undertaking as it met these conditions. Although up-country storage is not included in the Access Undertakings, the ACCC advised it will watch it for anti-competitive behaviour (ACCC, 2009).

In September 2009, the Australian Federal Government announced that its Productivity Commission (PC) would assess whether the current wheat marketing

arrangements are meeting the objectives of the Wheat Export Marketing Act 2008 and the Wheat Export Accreditation Scheme 2008. The review was required under the Act.

One aspect of the analysis was the access tests. The PC concluded that, although the access tests have provided greater certainty and have potentially made access easier, timelier and less expensive than could have been done through the Trade Practices Act, these benefits will diminish in the longer term. However the PC also noted, the associated costs, such as reduced incentives to invest in port and in-country elevator facilities are expected to become much more significant and will ultimately outweigh the benefits. Therefore, the PC recommends ending the current arrangements and relying solely on the existing competition legislation under the *Trade Practices Act* beginning September 2014 (Australia Productivity Commission, 2010b). It is expected the Australia federal government will implement the PC's recommendation.

Chapter 3 Western Australian Wheat Industry

Western Australia is somewhat unique as it is relatively isolated from the rest of the Australian wheat growing regions, and the majority of its production is for export. The following describes the Western Australian wheat industry, including production and exports, wheat types and markets, and transportation.

3.1 Production and Exports

Over the 2004/05 to 2008/09 crop years, Australian wheat production averaged 18.6 million tonnes. Of this, Western Australia produced an average of 7.4 million tonnes, or approximately 40 per cent. When analyzing total Western Australian winter crop production over this period (including barley, oats, canola, among others), wheat production has accounted for over 60 per cent. Average Australian wheat exports over the 2004/05 to 2008/09 crop years were 12.3 million tonnes and domestic consumption was 6.5 million tonnes (with 3.7 for feed use) (ABARE, 2009). Of the export total, Western Australia exported on average roughly 7.1 million tonnes, or approximately 59 per cent. As these statistics show, Western Australia wheat destined for export markets accounted for roughly 96 per cent of production. The domestic market is relatively small as it only consumed roughly 300,000 tonnes on average over this period (WEA, 2010).

3.2 Wheat Types and Markets

The harvest period in Western Australia is from mid-October to late January, and Western Australia produces mainly four grades of wheat. The main grade of wheat is

Australian Premium White (APW), which accounts for roughly 30-35 per cent of total supply. APW is suitable for Asian noodles, as well as Middle Eastern and Indian style breads. Two other primary grades of wheat are Australian Standard White (ASW) and Australian Standard Wheat Noodle (ASWN), which each account for roughly 20-30 per cent of total supply. ASW is suitable for blending purposes and is primarily used for Egypt, Middle Eastern and Indian style breads, while ASWN is particularly used for noodles in Japan and Korea. A higher premium wheat is Australian Hard (AH), which accounts for roughly 15-20 per cent of total supply. AH is suitable for a variety of breads and noodles in markets such as Japan, Indonesia, Middle East and China (Queensland Government, 2008).

3.3 Grain Transportation in Western Australia

Grain in Australia is moved to the ports by rail and truck. The Western Australian Grain Freight Review reported that the market share of rail has fallen slowly, however overall volumes have been maintained. In the first year of deregulation, rail accounted for about 60 per cent of CBH's Grain Express system to transport grain from silo to port. Growers bypassing the system by trucking grain to port themselves accounted for 30 per cent (KPMG, 2009). The average distance a Western Australian grower is from port is 200km (Canadian Wheat Board, 2009). To put this distance in perspective, the average distance a western Canadian farmer is from port is 1300 km. Unlike their western Canadian counterparts, Australian growers typically have trucking as a feasible transportation option.

Rail

There is approximately 5100 kilometres of rail network in Western Australia's south-west region, with roughly half (2300 km) used almost exclusively for grain. Although the entire network is an asset of the State of Western Australia, WestNet Rail, a publicly traded, independent rail infrastructure provider, currently holds a lease to operate and maintain the network, called "below-rail" business (Grain On Rail, 2009). The dominating company for train services, also called "above-rail" business, is Australian Railroad Group, a publicly traded company that also operates in Queensland, New South Wales and South Australia. The Economic Regulation Authority regulates the "below-rail" business which includes setting the minimum and maximum it can charge. Beginning the start of the 2008/09 marketing year, CBH began negotiating on the "above-rail" business side through its Grain Express program. Grain Express is an exclusive dealing arrangement where growers that use CBH's storage and handling services must also use its grain supply coordination and transport services. At the time it was implemented, the ACCC did not oppose the arrangement as it believed there would be efficiency benefits. CBH advises that industry groups (Western Australian Farmers Federations (WAFF), Pastoralist and Graziers Association (PGA) and the National Agricultural Commodities Marketing Association (NACMA)) are involved in the freight negotiations to confirm transparency in freight (CBH, 2008a). CBH therefore ultimately determines the freight rate charged to growers (CBH, 2010a), however advises it does not make a profit or take a margin on freight. Following pressure from some industry groups, including, the PGA, in December, 2010, the ACCC proposed it would revoke

the policy, citing "By leveraging its dominance of up-country storage to force growers to use its transport services CBH can insulate itself from competition." (ACCC, 2010).

Chapter 4 Co-operative Bulk Handling Ltd

All three of the bulk handling organizations, GrainCorp, ABB and CBH began as grower owned co-operatives. However by deregulation, only CBH remained grower owned and controlled. The following describes the history of CBH and its current supply chain. It also describes CBH competitiveness, the challenges experienced in Western Australia in the first year of deregulation, as well as the Australian Productivity Commission's inquiry into the effectiveness of the new wheat marketing arrangements.

4.1 History

In the 1920's, trials were conducted in Western Australia to test bulk handling of wheat. In 1931, the Western Farmers Co-operative proposed to the Government that a bulk handling scheme be adopted, and two years later, Co-operative Bulk Handling was formed. In 1936, CBH was given sole rights to handle bulk wheat in Western Australia through the Bulk Handling Act and a year later it opened the first wheat export terminal at Geraldton. By the early 1940s, 236 CBH railway sidings were built, which increased CBH's capacity to 2.6 million tonnes. In 1943, control of CBH was given to a Board of Directors administered by the Western Australian grain growers. In the early 1950s, the CBH system was expanded to include barley and oats and all port terminals were handed over to CBH. By 1963, storage capacity reaches 3 million tonnes. By 1965, there were 305 up-country delivery points; however rationalization by 1970 resulted in receival points being reduced to 193. Between 1942 and 1976, CBH opened additional export terminals in Albany, Esperance and Kwinana. By 1998, CBH's storage capacity exceeded

15 million tonnes, and in the 1997/98 marketing year CBH received more than 10 million tonnes, making it the first bulk handler in Australia to do so (CBH, 2010b).

In 2002, CBH expanded its operations by merging with Grain Pool of Western Australia, the state's statutory exporter of canola, lupins and barley. As of 2010, CBH Group's wheat operations include "CBH Operations", "CBH Grain" and value chain partners (CBH, 2010b).

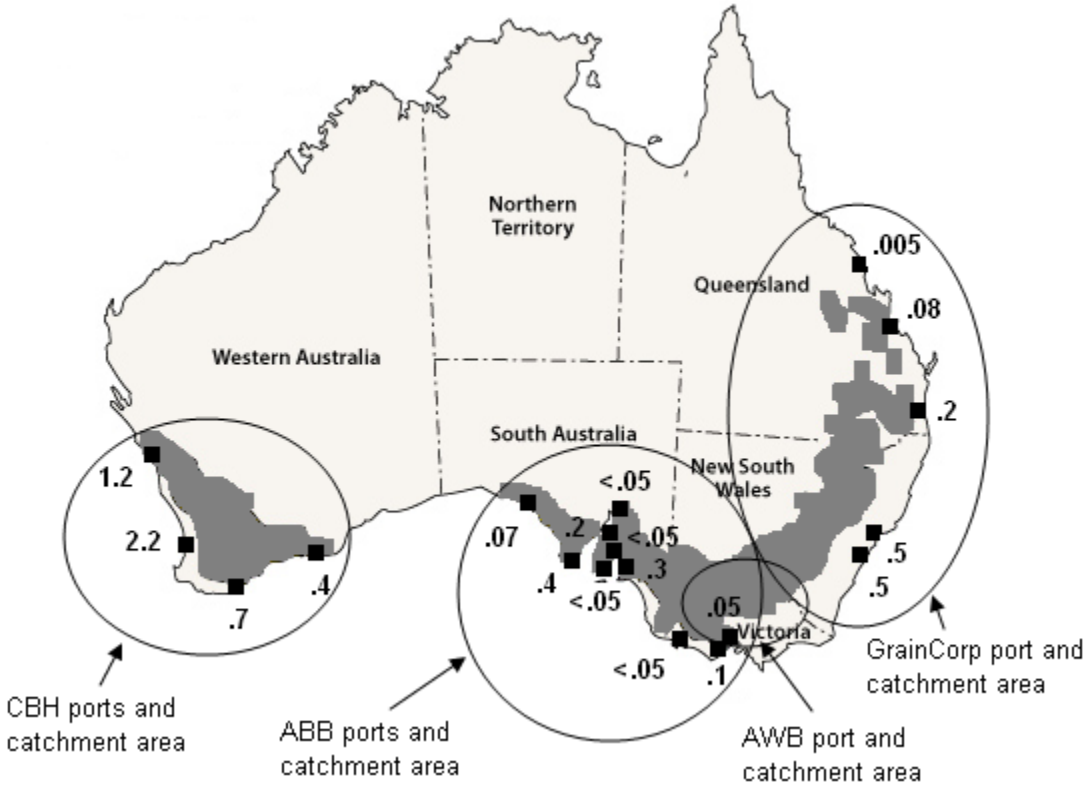
4.2 Current CBH Supply Chain

As of deregulation, CBH markets grain on behalf of 5,500 grower-shareholders. CBH Operations receives wheat through 197 delivery points, which are broken into five management zones in Western Australia. These delivery points account for roughly all the delivery points in Western Australia. Growers are provided with prices from competing companies (including accredited exporters) at CBH's receival points and therefore must declare who the grain will be sold to. From each receival point, wheat is transported to one of four CBH port terminals at Albany, Esperance, Geraldton and Kwinana, or to the Metro Grain Centre (MGC) located in Forrestfield. The four deep water port facilities are also the only ones in Western Australia. The MGC is a receival and distribution complex that consolidates grain from country storages before it is transported to CBH Kwinana Terminal for export, or bagged or containerised for niche export and domestic markets (CBH, 2010b).

CBH has a storage capacity of over 20 million tonnes, and also sources grain from Eastern Australia, however it does not have its own delivery locations or port facilities in that region as shown in Figure 4.1. CBH receives the quantity and quality details from

the operations division and exports to over 20 destinations around the world. Its value chain activities include a 50 per cent stake in Interflour, one of the largest flour milling operations in Asia, with milling capacity in Vietnam, Indonesia and Malaysia.

Figure 4.1: Australia wheat growing regions, with port locations by company and tonnage (in million tonnes) shipped in 2008/09 marketing year (by June 2009)



Source: WEA (2009b) and Australian Crop Forecasters (2009)

CBH also has a joint venture with Hudson Shipping called United Bulk Carriers and a 50 per cent in DailyGrain, an on-line grain price discovery and management service (CBH, 2010b). For the first year of deregulation, CBH announced it had secured roughly two billion dollars to pay growers for the season's harvest. It stated "In practice, it gives us the capacity to market and fund virtually the entire Western Australian grain harvest this year (CBH, 2008b). As discussed in the following section, CBH was the largest

exporter of wheat in the first year of deregulation and sold more than half of the bulk wheat exported out of Western Australia. Given this dominant role in Western Australia, CBH's objective may be to maximize member welfare through minimizing costs and providing higher prices than would otherwise be available if it was a privately held monopsony. Figure 4.1 shows the Australian wheat growing regions, the port locations for all the bulk handling agents and the tonnage shipped in the 2008/09 marketing year.

4.3 CBH Competitiveness

The market shares for all of Australia in the 2008/09 crop year as of June 2009, had CBH leading with 24 per cent, followed by AWB with 21 per cent, then ABB with 10 per cent, followed by Grain Corp and Cargill with 9 per cent each (Citigroup, 2009). When looking specifically at Western Australia, CBH was estimated to market roughly 50 per cent of the grain, while handling 100 per cent of the grain through their supply chain facilities (Canadian Wheat Board, 2009). This can also be shown in Figure 4.1 as CBH faces no competition in Western Australia through control of all four port locations for bulk grain exports.

Another factor contributing to CBH's market share is a natural ocean freight advantage. CBH has also already given itself a competitive advantage due to securing supply for its value-added activities through its partnership with end user, Interflour, in parts of East Asia.

While Australia enjoys a freight advantage to the Middle East and East Asia, compared with other major wheat exporters such as Canada and the U.S, Western Australia enjoys an ocean freight advantage over the Southern and Eastern regions.

Although freight rates are extremely volatile, Table 4.1 provides a snapshot comparison of ocean freight rates between the United States (U.S.) Pacific North-West (PNW), with Eastern and Western Australia. The PNW also reflects ocean freight rates for the Canadian west coast.

Table 4.1: Ocean Freight Rates: Australia and the PNW

Ocean freight estimates for June 2009 (per tonne):

	PNW	Eastern Australia	Western Australia
China	$28.00	$20.00	$18.00
Indonesia	$33.00	$20.00	$16.00
Japan	$30.00	$26.00	$25.00
Korea	$31.00	$26.00	$25.00
Malaysia	$34.00	$21.00	$17.00

Source: based on IGC data for June 16, 2009

Chapter 5 The Co-operative Life Cycle

5.1 The future of CBH and the Co-operative Life Cycle

Pressures on co-operatives to evolve into private companies include greater capital flexibility and grower access to equity. However, while these organizations are in transition, these pressures may also lead to conflicts between the interests of growers and outside investors (Cook, 1995). Not widely analyzed in the evolution from co-operative to a private company are the price, quantity and welfare impacts on the grower. Now that the bulk wheat export market is deregulated and CBH remains grower owned and controlled, this analysis is possible. As the majority of wheat produced in Western Australia is destined for export markets, and therefore goes through CBH's supply chain, CBH's value for growers should be more visible than was the case for GrainCorp and ABB. This chapter provides a history of CBH's restructuring discussions. It also describes the "Cooperative Life Cycle" developed by Cook (1995) and how it has been used to explain the restructuring of the other former co-operatives, such as ABB and GrainCorp, and how it can be used to explain the restructuring decisions facing CBH.

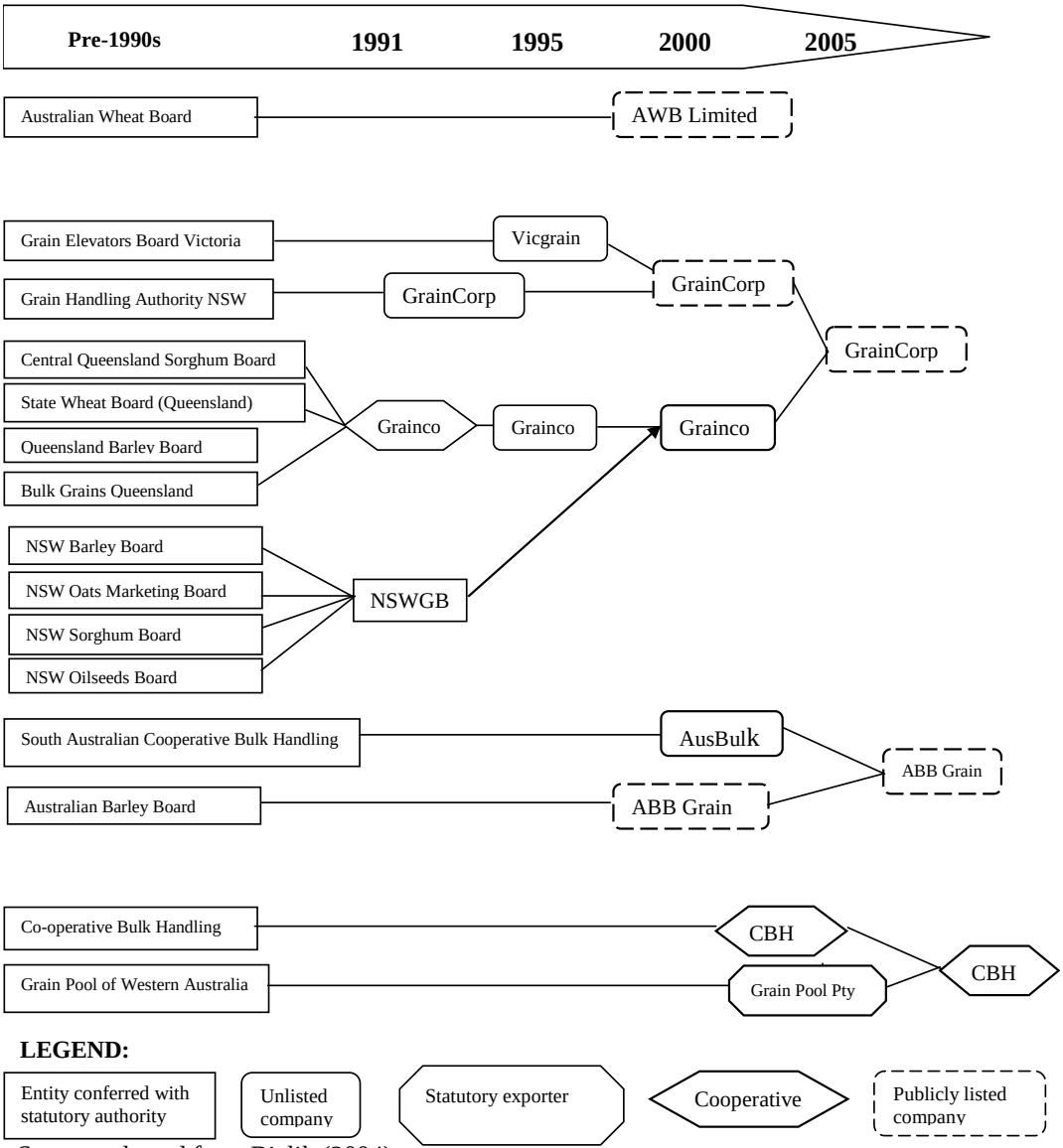
5.2 Co-operative Life Cycle

Cook (1995) examined U.S. agricultural co-operatives and developed a life cycle model as to why they are formed and the structural and strategic shifts that determine their evolution. Cook argues that co-operatives are formed as a response by producers when there are depressed prices or market failures. The second stage of their evolution is where the co-operative usually provides more favourable prices than private oligopsonists

or oligopolists. In the third stage, the strategic behaviour of competitors changes, resulting in their prices being more competitive with that of the co-operative. In addition, the costs of co-operative become scrutinized by members and there are conflicts over control due to vague property rights. During the fourth stage, managing the co-operative becomes increasingly difficult as the assets become more valuable and equity increases. At this point, the co-operative moves into the fifth stage, where it has three options; exit, continue or transition (Cook, 1995).

Bielik (2004) applied the life cycle to the Australian grain industry and found evidence to support Cook's theory, due to all the co-operatives except CBH transitioning into investor-share co-operatives. By 2008, all the investor-share co-operatives had transitioned further due to the elimination of their dual class share structures, making them fully publicly traded companies (Bielik, 2004). The evolution of these organizations is depicted in Figure 5.1.

Figure 5.1: Evolution of Australian grain marketing and handling organizations



Source: adapted from Bielik (2004)

Bielik analyzed CBH's situation by the 2000s by putting it into context with the property rights problems associated with Stage 3 of Cook's co-operative lifecycle. The first problem mentioned is the "free rider" problem. Cook notes there are two free rider problems; external and internal, however for this analysis only external is relevant. External is where individuals benefit from the co-operative's action's, however without actually becoming members and sharing the costs. Bielik concludes that CBH may

experience this external free rider problem if competition enters the Western Australian storage and handling sector. Bielik notes the "control" problem may also exist as CBH management is not subject to the same external monitoring problems experienced by Investor Oriented Firms (IOFs) such as stock prices, takeover threats or other public information reporting. The influence problem exists when members attempt to influence the co-operative's decisions so it interests are more in line with their own. Bielik concluded that growers only have the option to express dissatisfaction with CBH through their votes for elected directors, vs. exiting the organization through selling their equity holding (Bielik, 2004).

5.3 CBH Restructuring Discussions

In 1989, CBH lost its sole handling rights through the deregulation of the domestic grain market. Following the deregulation of the domestic market, during the 1990s many organizations were diversifying to prepare for the possibility of an open market. By 2000, CBH was the only traditional bulk handler that focused only on storage and handling activities and its board and management became concerned that major competitors would enter the Western Australian market if the market became fully deregulated. As a result, CBH provided growers the opportunity to restructure CBH into a private entity, however growers voted to retain the co-operative structure. As discussed earlier, managing co-operatives becomes increasingly difficult as the assets become more valuable and equity increases. This may lead to problems for CBH in the future, but hasn't necessarily lead to opposition of the current structure.

In 2008, CBH management was commissioned to conduct an investigation into the best structure for the co-operative. The need for capital was identified as a key driver for co-operative mergers or restructures (Cook, 1995). In CBH's director elections early 2010, some candidates held the opinion that corporatization was best for CBH, however they were defeated by co-operative supporters and others who were neutral on the issue. The result was a continued split down the middle, with six of the twelve supporting the status quo (Donkin, 2010). In September 2010, CBH held a month long series of meetings to canvass growers' response to different structures. The three broad models which were shortlisted for further assessment are:

- A non-distributing Co-op - retains CBH's current tax-exempt status with value returned to members through competitive services and rebates
- A distributing Co-op, which allows distribution of profits to growers in the form of cash and/or share rebates.
- A dual Co-op, which comprises two separate Co-operative entities, one holding storage and handling assets and the other holding the remaining assets of the business (CBH, 2010c).

Following the consultations with growers, in January 2011, the CBH Board of Directors selected the continuation of a non-distributing Co-op structure (CBH, 2011).

Chapter 6 Modeling Western Australia's Market

6.1 Market Structures and the Objectives of Producer Owned Marketing Agents

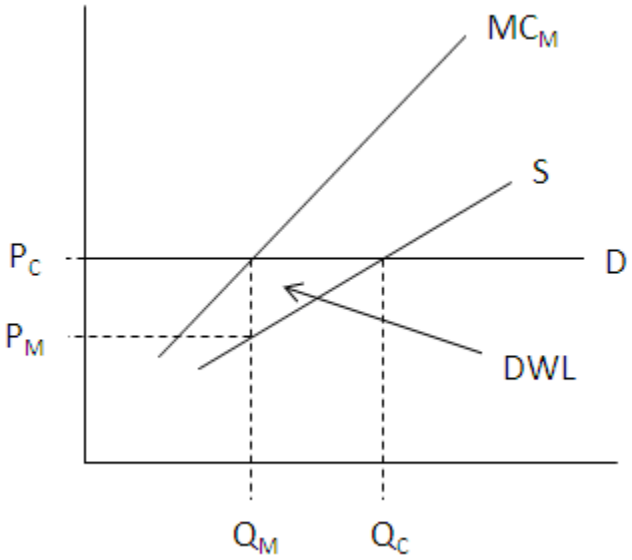
For the purpose of analyzing the impact of CBH altering its structure, it is necessary to first define the market structure of the Western Australian wheat market. CBH has been characterized as a regional monopoly, however this is not an accurate description of the marketing structure as it implies CBH is the only seller of Western Australian grain. The Canadian Wheat Board (CWB) in Western Canada has also been characterized as a monopoly as described by Schmitz et al (2005). Similar to the CWB who is the only buyer of Western Canadian wheat and barley for export, some have argued that CBH is the only buyer of grain in Western Australia due to its control over the supply chain. Given this, the Western Australian grain market would be more accurately characterised as a monopsony. However, monopsonist firms would be expected to exploit supplying producers, while the CWB and CBH are both producer-marketing agents with producers likened to shareholders. Schmitz et al (2005) also compares this characteristic of the CWB to that of a multinational's (MTNs) where "To the extent that these MTNs can earn profits from market power, the returns go to the MTN shareholders rather than to the grain farmers themselves." (Schmitz et al 2005)

6.2 Objectives of a Private Monopsony

If CBH evolved into an investor held firm, given the current supply chain control, it can be argued that the marketing structure will be a monopsony with profit maximizing objectives. Figure 6.1 demonstrates the impacts of a private monopsony on price,

quantity and the resulting welfare impacts, by comparing it to a competitive market. For both markets, assume world price is taken, as indicated by a horizontal demand curve, which is equal to marginal revenue for the firm. In a competitive market, buyers must accept the upward sloping supply curve (S). The equilibrium price and quantity for the competitive firm is where world demand equals supply. Under the private monopsony however, the marginal buying cost facing the firm is steeper than the supply. The private monopsony will buy the quantity where this marginal cost equals the flat world demand curve, which is less than the quantity purchased in a competitive market. Additionally, the corresponding price paid by the private monopsony is determined at where this quantity crosses the supply curve, which is less than the world price paid in a competitive market. Figure 6.1 also shows a deadweight loss (DWL) attributed to a private monopsony as producers sell less quantity at a lower price than under competitive conditions.

Figure 6.1: Private Monopsony vs. Competitive Market Equilibrium



6.3 Assumptions about Firm Objectives

From the perspective of the grower, this study assumes, a comparison of the prices currently received under the co-operative structure, versus what would be received under a new structure is of interest. This study performs an empirical analysis on the price, quantity and welfare impacts of altering the structure from a user controlled co-operative to a private company with a monopsony. In addition, given the obvious impact the growers supply response should have on the private monopsony's profit, this study will also perform a sensitivity analysis on varying supply elasticities.

It should be noted a private firm is not currently listed by the CBH as a model to further assess, however this study argues there is evidence that this could eventually occur due to other former Australian grower owned and controlled co-operatives that transitioned into publicly traded companies. Therefore, this analysis is intended to provide insight to the impacts of introducing stakeholders other than grower-members.

6.4 Previous Models of Co-operatives and Private Monopsonies

There is substantial literature addressing the economic implications of co-operatives as well as on monopolies / monopsonies. It may also be worthwhile to review some of the literature on oligopolies and oligopsonies, given they deal with a "few" sellers and buyers, respectively. This section will provide an overview of some of the previous research

A study by Royer (1999), looked at the numerous approaches to analyzing the co-operative organizational form and its institutional characteristics, including transaction cost economics, agency theory and property rights. Royer concludes that the principal

focus of past studies is to uncover inherent weaknesses in the co-operative organizational form, which are then used to predict economic inefficiencies that eventually lead to their decline. He notes an example of this is Cook's lifecycle theory. Royer argues that the evidence of these inefficiencies are far from conclusive and that other research, for example, Sexton and Iskow have shown how they are flawed. Royer discusses a particular condition where farmers' benefit, as examined by Staatz (1987), called the holdup problem. This can exist in a private model, where processors refuse delivery of a commodity with the intention to force farmers to accept a lower price. Vertical integration, such as forming a co-operative is one solution to such a problem.

Nilsson (2001) also looked at the criticisms of many economists on co-operative firms, such as property rights and agency theory, members not controlling management, short term investments which are below the economic optimum, etc. Nilsson argues that many co-operatives function well for their members and that many of the criticisms are not generally justified. Examples of benefits to members include possible lower transaction costs, versus selling to independent trading partners and the possibility of reaping economies of scale.

Torgerson, et al (1997) reviewed earlier co-operative thought and theory. They argue that "Co-operatives represent one of the few options that farm entrepreneurs have for surviving in a more concentrated and integrated global agriculture." Specifically, they say co-operative's essential function is to perform vertical integration. By doing so, transaction costs are lowered which reduces the margin between retail prices and the farm. As well, farmers respond to these higher prices with higher production.

Soboh, et al (2009) reviewed the empirical and theoretical economic literature on the performance of agricultural marketing co-operatives. The authors describe the view of some that co-operatives are a form of vertical integration whose objective is to maximize the benefits of the members. However, they state this type of empirical work has been virtually ignored, due to the inaccessibility of data and the inability to take into account the interests of the various types of stakeholders. Instead, they determine that most of the focus of empirical studies is to evaluate the performance of the co-operative as if it was an investor-oriented-firm. In addition, they found there have been a few studies that have used mathematical and statistical tools to determine the economic efficiency. However, they state that these studies have viewed the co-operative as having a single objective, that is, to maximize profits. This fails to address the nature of the co-operative, which is a firm that is user owned, controlled and benefited. Therefore, they advise co-operatives should be viewed as having a dual purpose; that is to cope with the competitive market environment and to fulfill the objectives of its members.

A study by Kraft, et al (1996), attempted to document and analyze the economic performance of the CWB. Specifically it looked at the Hard Red Spring Wheat market and compared the CWB's performance to that of the export competition, as well as the value of the single desk compared with the likely prices in a multiple seller environment.

It also looked at the economic efficiency as described by marketing costs, the performance of the CWB in market development activities and an analysis of the institutional nature of the CWB and what it means for its stakeholders. They concluded that single desk selling of wheat through the CWB results in higher sales revenue than if there were multiple sellers. They also concluded that marketing costs appear to be lower

than for other crops (sold by multiple sellers), such as flax and canola, also that market development activities, for example in Brazil, were being performed successfully. In terms of describing the institutional framework of the CWB, the authors concluded it is a form of collective action by farmers and government and that farmers should have a greater understanding of the working of the CWB.

Another study was performed by Schmitz, et al (2005), although instead of wheat, it analyzed the CWB's single desk in barley marketing (feed and malting). They implicitly assumed market power and price discrimination and set parameters for markets as if the CWB was maximizing returns to the pool. They concluded that the single desk system creates more revenue for Western Canadian farmers, versus a multiple seller environment, due to the ability of the CWB to exercise market power.

On the subject of oligopolies, van Berkum and van Meijl (2002) compared theoretical concepts from early neo-classical theory perceptions of comparative advantage to modern trade and growth theories. In an oligopoly model, where there are many buyers, but few sellers, they also describe these markets as ones where firms are mutually dependent on each other's decisions. With trade being open, the market becomes more competitive, therefore each firm faces higher elasticity of demand, which leads to expanded output and a decline in prices.

Patterson and Abbott (1994) looked at the relationship between export market structure and the pricing behaviour of US grain exporting firms. This was done by using a generalized Cournot model, estimated by US corn and wheat exports. The conclusion was that price discrimination was significantly related to export seller concentration, the firm's market share in the US, total export volume and import market size. However,

their results did not find a significant correlation between the market structure variables described and export price mark-up.

Under an oligopsony market structure, where there are many sellers, but few buyers, Chen and Lent (1992) intended to show that for a primary agricultural market, a supply shift of agricultural products may affect equilibrium prices and quantities of the products, as well as they buyers purchasing the products, differently than under perfect competition or a monopsony (many sellers, but one buyer). They conclude from their results that a supply shift up or down of a product may decrease or increase its price, with a critical variable being the supply disturbance of the product.

Additional research on oligopsonies was done by Rogers and Sexton (1994) as they argued that most research was on oligopolies. They feel that it is especially important when analyzing raw commodity markets due to four reasons. The first being the nature of the products being bulky, resulting in high shipping costs, therefore limiting farmer's access to buyers. The second being processor's needs are highly specialized and therefore they cannot normally use substitutes. The third is that much of farmer investments are in sunk assets and therefore supply is relatively inelastic, while the fourth is that seller power, through marketing co-operatives or bargaining associations are present or potentially present in the market which are a means of countervailing the power of oligopsonies. They concluded from their results that these factors may interact to produce large farm to retail price spreads and that the oligopsony/monopsony issue deserves further policy debate.

Chapter 7 Modeling a Western Australian Co-operative and a Private Monopsony

The following analyzes the impact of the organizational structure of CBH on Western Australian growers, specifically the price, quantity and welfare effects. The first section analyzes CBH as it is currently, as a grower-owned co-operative. The second section predicts the impacts if CBH altered its structure to a private company with monopsony power.

7.1 CBH as a Co-operative

CBH's objective as a co-operative is to maximize producer utility, or maximize the combined profits of all growers and CBH together.

What is the profit function for all growers? Revenue is price received from CBH (Pg) less the on-farm variable costs (VCg) both multiplied by the quantity supplied by the grower. If we assume a linear supply, there is a constant amount dependent upon the grower's response to the price obtained $(Q = a + bPg)$. Growers' profit function also includes exogenous on-farm fixed costs (FCg) such that:

$$\pi = Pg * (a + bPg) - VCg * (a + bPg) - FCg$$

Re-written as:

$$\pi = (Pg - VCg) * (a + bPg) - FCg \qquad (1)$$

What is CBH's profit function? Revenue is price received from the world (Pw) less the price given to the grower (Pg) less the variable costs of the supply chain $(VCsc)$,

multiplied by the same quantity supplied by the grower above $(Q = a + bPg)$. The profit function also includes exogenous supply chain fixed costs $(FCsc)$ such that:

$$\pi = (Pw - Pg) * (a + bPg) - VCsc * (a + bPg) - FCsc$$

Re-written as:

$$\pi = (Pw - Pg - VCsc) * (a + bPg) - FCsc \quad (2)$$

If the CBH is a grower owned co-op it can be assumed that the co-op includes the total welfare of its members in its decisions. To capture this objective, this study combines the profit function for all growers and CBH:

$$\pi = (Pg - VCg) * (a + bPg) - FCg + (Pw - Pg - VCsc) * (a + bPg) - FCsc$$

Simplifying this equation results in $Pg(a + bPg)$ being lost on the revenue side as a cost to the co-op:

$$\pi = Pw * (a + bPg) - VCsc * (a + bPg) - VCg * (a + bPg) - FCg - FCsc$$

Re-written as:

$$\pi = (Pw - VCsc - VCg) * (a + bPg) - FCg - FCsc$$

Note: this function is linear in Pg and drop FCg and $FCsc$ (assumed equal to zero).

$$\pi co - op = (Pw - VCsc - VCg) * (a + bPg) \quad (3)$$

If profits are linear in Pg, profit maximization is likely at one of the corners of this problem:

$Pg = 0$ or $Pg = Pw - VC$.

It is unreasonable for CBH to offer its growers (Pg) more than what it receives from the market (Pw) minus its variable costs $(VCsc)$, as any higher Pg results in CBH incurring losses (equal to the gains on the farm). This also means Pg has a maximum value. We can't have: $Pg > Pw - VCsc$, or $Pg = Pw - VC + e$

I argue that combined profits for all growers and CBH are highest when grower price is set to: $Pg = Pw - VCsc$ (at this level, CBH does not earn a profit).

Define πcap profit as defined above where $Pg = Pw - VCsc$, or:

$$\pi cap = (Pw - VCsc - VCg) * (a + b(Pw - VCsc)) \quad (4)$$

If instead CBH earns a profit by setting $Pg < Pw - VCsc$, define combined profits for all growers and with $Pg < Pw - VCsc$ or $Pg = Pw - VCsc - e$ and label πlow:

$$\pi low = (Pw - VCsc - VCg) * (a + b(Pw - VCsc - e)) \quad (5)$$

By including equation (4) in equation (5):

$$\pi low = \pi cap - (Pw - VCsc - VCg) be \quad (6)$$

So, as long as Pw is greater than $VCsc + VCg$, and b is positive (i.e. supply is upward sloping):

$\pi cap > \pi low \ \forall \ \ positive \ \ e$

So any Pg less than $Pg = Pw - VCsc$, will lower profits. The maximum combined profits will be at:

$$Pgco - op^* = Pw - VCsc \quad (7)$$

This is consistent with what is expected as CBH should not be earning a profit as it passes it on to growers. If profits were maximized at $-e$, then CBH would earn a profit at the expense of growers. Also, if profits were maximized by adding $+e$, growers

would benefit through higher prices, however CBH would be operating at a loss for every tonne at $-e*(a+bPg)$ which is not likely.

7.2 CBH as a Private Monopsony

As a private monopsony, CBH should follow the profit-maximizing behaviour of any other private firm for the benefit of its shareholders. They will not include the profits of growers as a whole in their objectives.

On the revenue side, price is determined by the difference between world price (Pw) that is taken as exogenous and the price paid to growers (Pg). The price paid to growers (Pg) is what will be determined through the model to maximize profits. This difference is multiplied by the quantity supplied by the grower $(Q = a + bPg)$, which is also a function of the chosen Pg. Therefore revenue is:

$$R = (Pw - Pg)*(a + bPg)$$

On the cost side, the variable cost per tonne is taken as exogenous and is multiplied by the same quantity function $(Q = a + bPg)$. Fixed costs are an added constant to complete total cost. This total amount is also considered to be the supply chain cost:

$$TC = VCsc*(a + bPg) - FCsc$$

Therefore, the profit function for CBH as a private monopsony is:

$$\pi monop = (Pw - Pg - VCsc)*(a + bPg) - FCsc$$

As discussed above, supply is upward sloping so Pg cannot be set too low as it will impact quantity supplied by the grower. Assume $FCsc$ equal to zero and group terms so that:

$$\pi monop = (Pw - Pg - VCsc) * (a + bPg) \quad (8)$$

To find the Pg that maximizes profits, differentiate π with respect to Pg and set it equal to zero:

$$\frac{\partial \pi}{\partial Pg} = bPw - a - 2bPg - bVCsc = 0$$

$$Pgmonop* = \frac{bPw - a - bVCsc}{2b} \rightarrow \frac{Pw - VCsc}{2} - \frac{a}{2b}$$

$$Pgmonop* = 1/2 (Pgco - op*) - \frac{a}{2b} \quad (9)$$

Therefore, we would expect that this private monopsony grower price $Pgmonop*$ is lower than the co-operative grower price $Pgco - op*$:

$$Pgmonop* = 1/2 (Pgco - op*) - \frac{a}{2b} \leq Pgco - op* = Pw - VCsc$$

As long as 'a' in the supply function is not too large and negative, the supply function could still be well behaved with a negative 'a'. So we cannot be sure if the private monopsony would lower quantity through the whole supply chain and decrease the grower's price and overall welfare. To confirm the impact of a private monopsony we need to try simulations of supply estimated by other researchers.

Chapter 8 Simulation and Results

8.1 Numerical Simulations

The pricing and quantity data used is from the Australian Bureau of Resource and Agricultural Economics (ABARE), the United States Department of Agriculture (USDA) and CBH. Elasticity data is from the Food and Agricultural Policy Research Institute (FAPRI).

First, the Western Australia supply function needs to be determined. This is obtained by using the co-operative CBH conditions for the crop years 2000/01-2004/05. Western Australia supply elasticity for this period: $\varepsilon = 0.27$[2], with average Pw = \$279[3] (per tonne) and Q=7.46[4] (million tonnes):

$$\varepsilon = 0.27 = \frac{\partial Q}{\partial P} * \frac{P}{Q} = \frac{b*(279)}{7.46} = 0.27 \rightarrow b = \frac{0.27*(7.46)}{279} = 0.0072$$

Q (in million tonnes) = a + bP

$$7.46 = a + 0.0072*(279) \rightarrow a = 5.4512$$

Thus the supply function is: $Q = 5.4512 + 0.0072P$

Note this suggests a positive quantity supplied even at a price of zero. This may be realistic as growers seem to seed wheat regardless of the price and it can be argued that commodity production can be described as inelastic as growers cannot easily switch resources to produce another commodity. An inelastic supply is also described as a relatively large change in price is needed to produce a relatively small change in quantity supplied.

[2] FAPRI (2010)
[3] FAPRI (2010) and ABARE (2010)
[4] FAPRI (2010) and ABARE (2010)

8.1.1 CBH as a Grower Controlled Co-operative

Given Pw = $279[5], VCsc = $47[6] and VCg = $92[7] (all on a per tonne basis), as discussed above in the profit maximizing grower price, and the resulting quantity supplied for the co-operative is:

$$Pgco-op^{*} = Pw - VCsc$$

$$Pgco-op = \$232$$

$$Qco-op = 7.12$$

The variable costs and the profit maximizing grower price determined by equation (7) are inserted into equation (3) to determine the profit for the co-operative:

$$\pi co-op = (Pw - VCsc - VCg)^{*}(a + bPg)$$

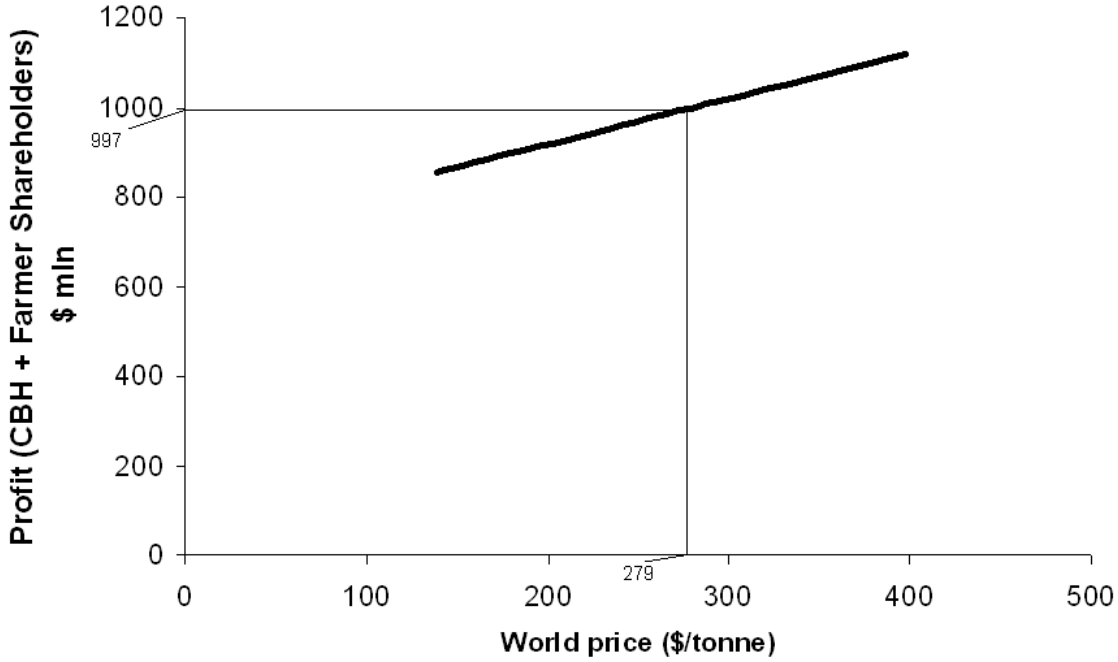
$$s.t. Pg \le Pw - VCsc$$

$$\pi co-op = \$996.80$$

Given the CBH does not earn profits under the co-operative model $(Pw - Pg - VCsc = 0)$, the above profits are the total of all growers. For this simulation, it is assumed the variable costs for both the grower and the supply chain are static, therefore world price is the variable that is volatile. The relationship of world price to profits of CBH as a co-operative is shown in Figure 8.1.

[5] FAPRI (2010) and ABARE (2010)
[6] CWB (2009)
[7] CWB (2001)

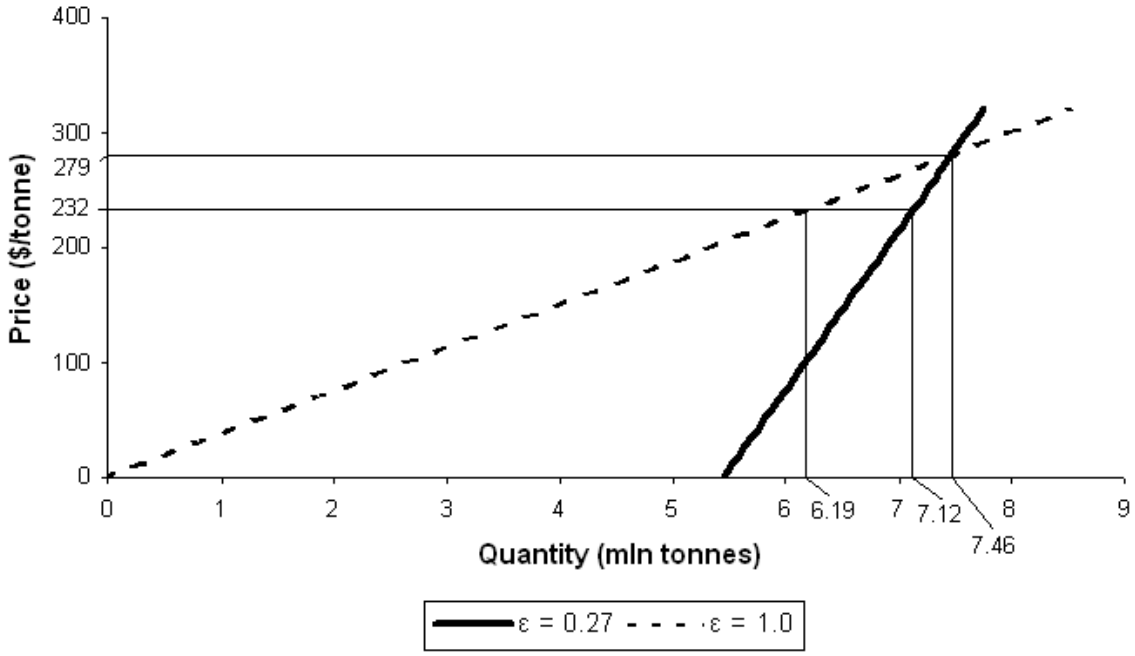
Figure 8.1: Grower Controlled Co-operative CBH – Profit vs. World Price



Note growers will only supply wheat if they receive a price equal to or greater than their variable costs (discussed later). Therefore a minimum world price needs to be received to obtain a profit.

As shown in Figure 8.2, given the current inelastic supply (0.27), growers are much less sensitive to price changes, versus a unit elastic supply (1.0). Both elasticities cross at the current world price of $279 and quantity of 7.46 million tonnes. With supply chain variable costs set at $47 per tonne, grower price is $232 per tonne, however the resulting supply response from growers is different under different elasticities.

Figure 8.2: Grower Controlled Co-operative CBH – Grower Price vs. Quantity Supplied



8.1.2 CBH as a Private Monopsony

Using the same values as for the co-op model:

Pw = $279; a = 5.4512; b = 0.0072; VCg = $92; VCsc = $47; Pgco-op = $232

And inserting them into equation (9), the profit maximizing grower price and resulting quantity supplied for a private monopsony is determined:

$$Pgmonop^* = \tfrac{1}{2}\left(Pgco-op^*\right) - \frac{a}{2b}$$

$$Pgmonop = -\$262.56$$

$$Qmonop = 3.56$$

CBH as a private monopsony maximizes profit by offering growers a lower price while still getting some quantity supplied. As shown above, as a result of our inelastic supply elasticity, using actual numbers results in a negative grower price which is

unreasonable. We can assume growers will not likely grow wheat if the price they receive is less than their variable costs (VCg). Given these conditions we will assume that profit maximization for a private monopsony will occur at $Pg = VCg$. By inserting the values above (including $Pg = \$92$) into equation (8), the private monopsony's profit, and new quantity supplied is determined:

$$\pi monop = Pw * (a + bPg) - Pg * (a + bPg) - VCsc * (a + bPg)$$

$$s.t Pg \geq VCg$$

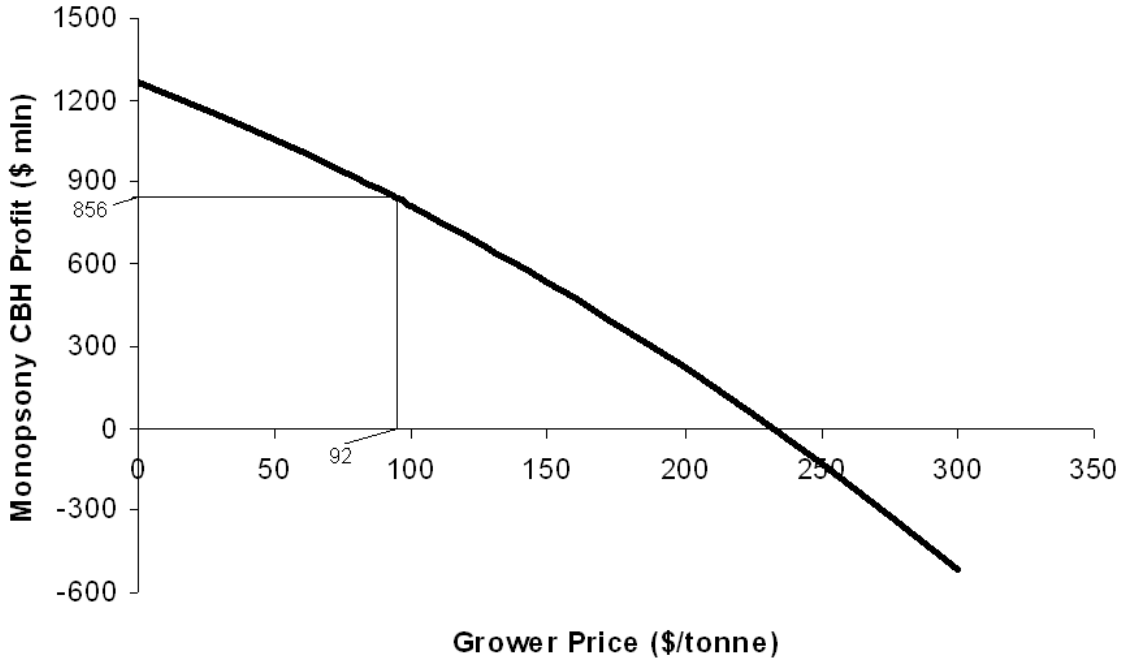
$$\pi monop = \$853.30$$

$$Pgmonop = \$92$$

$$Qmonop = 6.1$$

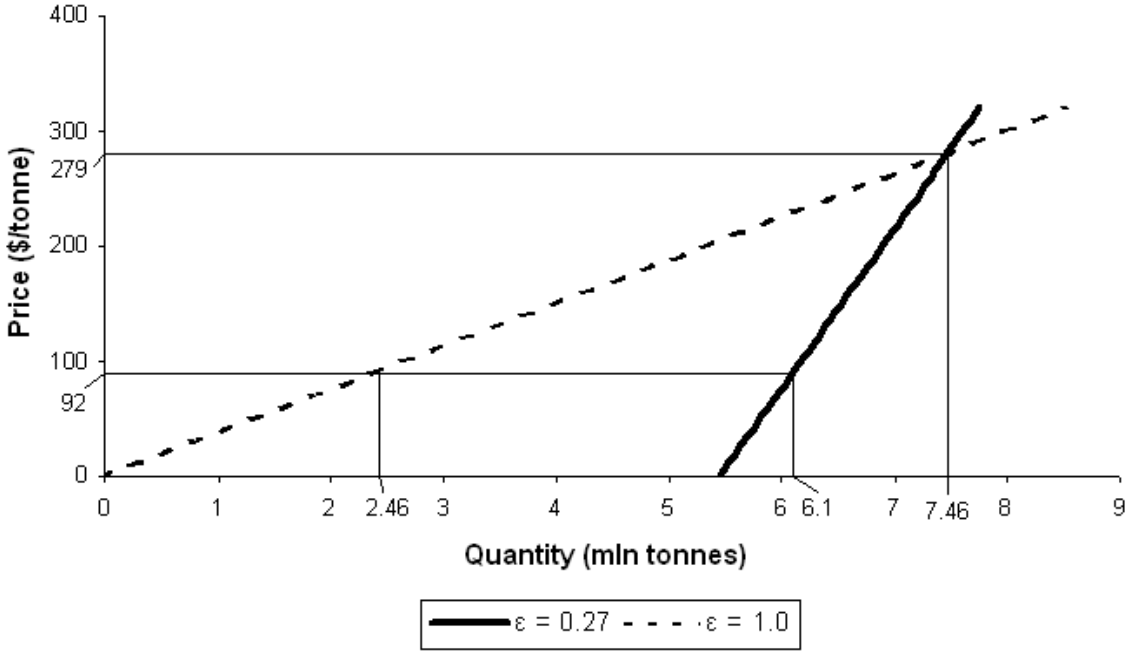
A graphical representation, given the values provided, of the grower price impact on the private CBH monopsony's profit is shown in Figures 8.3. Note the region to the left of the grower variable cost amount of $92 is unreasonable, however it does demonstrate the impact of grower price on the private CBH monopsony's profits.

Figure 8.3: Private CBH Monopsony – Profit vs. Grower Price



A graphical representation, given the values provided, of the supply and demand relationship in the private CBH monopsony model is shown in Figure 8.4. Note the region below the grower variable cost amount of $92 is unreasonable. As shown in Figure 8.4, given the current inelastic supply (0.27), growers are much less sensitive to price changes, versus a unit elastic supply (1.0). As mentioned earlier, both elasticities cross at the current world price of $279 and quantity of 7.46 million tonnes. With setting grower price at $92 per tonne, the resulting supply response from growers is different under different elasticities.

Figure 8.4: Private CBH Monopsony – Grower Price vs. Quantity Supplied



8.1.3 Simulation Summary

Using the theory and values provided, the co-operative model results in:

$Pgco - op = \$232$

$Qco - op = 7.12$

$\pi co - op = \$996.80$ (returned to grower shareholders as CBH does not earn a profit)

The private monopsony model results in:

$Pgmonop = \$92$ (optimal Pg was -$263, however assume limit of VCg, therefore Pg = $92)

$Qmonop = 6.1$

$\pi monop = \$853.30$

From these results, growers are better off with the current co-operative structure versus a private CBH monopsony, as it yields higher grower prices and corresponding higher quantities supplied.

Given these prices, if CBH evolves into a private monopsony, handling profits increase from $0 to $853 per tonne.

8.2 Actual CBH Profit Comparison

CBH does earn a profit, although it does not follow profit "maximization". Given this, it is necessary to compare actual CBH profit to what this study would expect CBH to earn as a profit as a private monopsony. Using CBH's profit for the 2008/09 crop year (the first year in a deregulated market) and tonnes handled, a profit per tonne can be calculated (CBH, 2009):

Profit (before tax) = $118 million

CBH tonnes handled = 12.33 million tonnes

Profit per tonne = $11.35

*Note this profit and quantity includes other grains, however it should be representative of wheat profit per tonne given wheat makes up a large share of the grain handled. Also $16 million was paid out as loyalty payments to growers which reduces the profits retained to $102 million or $8.27 per tonne.

The recently agreed upon objectives of the cooperative also suggest profit maximization is not the objective of the CBH.

> "The enhancements we are exploring under this model include partial refunding of charges to reward growers for their patronage of our storage and handling network, more investment in our storage and handling network and the development and rollout of new products, services and investment instruments that will provide more value to growers and

> the industry. . . . This structure allows us to return value to members in ways that the vast majority have asked from their co-operative. These include keeping storage, handling and freight charges as low as possible and continuous investment in maintaining and upgrading the storage and handling network." (CBH, 2011)

Using this study's theory to calculate what CBH would earn as a private monopsonist, a world price for the crop year 2008/09 of $360 per tonne is used. By inserting this price into the profit maximizing formula for CBH as a private monopsonist and assuming the same elasticity and variable costs:

Profit = $1.35 billion

CBH tonnes handled = 6.1 million

Profit per tonne = $221

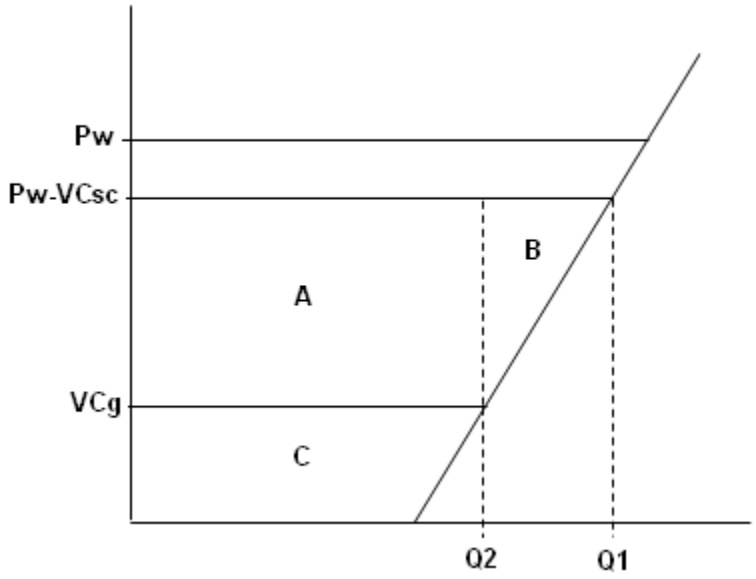
These results demonstrate that current profit levels are relatively low when compared to what optimal levels for a private CBH monopsonist. However, it may also be unrealistic to assume CBH as a monopsonist would profit maximize if other regulations (such as through the ACCC) are put in place to prevent anti-competitive behaviour. In any case, it appears CBH's profits earned are still for the benefit of the grower members as the funds are used to invest in the supply chain and value-added activities or returned to members according to patronage.

8.3 Welfare Simulation

The welfare impacts of moving from the current co-operative CBH structure to that of a private CBH monopsony is simulated in Figure 8.5. PSg indicates the combined welfare of the cooperative (both the grower and CBH). In the figure below, this surplus is the total area under the price provided to the grower, as indicated by the areas A+B+C. If the cooperative is altered to a private monopsony, this collective grower surplus is

reduced by areas A+B, therefore grower only surplus becomes only area C. PSmonop indicates the welfare of the private monopsony only and does not reflect the welfare of growers. As described above, the grower surplus is reduced with the transition to the private monopsony, therefore the surplus area of the private monopsony is A. However, the area B becomes the deadweight loss under the private monopsony.

Figure 8.5: Welfare Demonstration



Combined surplus (grower and CBH) under cooperative:

$$PSgrower = (Pw - VCsc - VCg) * Q_2 + ((Pw - VCsc - VCg) * (Q_1 - Q_2) * 1/2) + VCg * a + (VCg * (Q_2 - a) * 1/2)$$

Grower surplus under private monopsony:

$$PSgrower = VCg * a + (VCg * (Q_2 - a) * 1/2)$$

Private CBH monopsony surplus:

$$PSmonopsony = (Pw - VCsc - VCg) * Q_2$$

Deadweight loss under private monopsony:

$$\Delta DWL = (Pw - VCsc - VCg) * (Q_1 - Q_2) * 1/2$$

Under the cooperative, grower price is determined by world price less the variable costs of the supply chain, therefore $232 per tonne. Table 8.1 shows the resulting welfare when moving from a cooperative to a private monopsony. Additionally, surplus is impacted by elasticity. Table 8.1 also demonstrates this impact. At the elasticity 0.27, private monopsony profit maximization was where grower price was at *VCg* . This simulation uses grower price at *VCg* for all elasticities.

Table 8.1: Welfare Analysis – Binding Private Monopsony Grower Price at VCg

Pw	279									
VCsc	47							Resulting		
VCg	92				Grower	Grower	Grower	grower	Resulting	Resulting
Q*	7.46				price	surplus	price	surplus moving	monopsony	deadweight
Pw-VCsc	232				under	under	under	from co-op	surplus moving	loss under
					cooperative:	cooperative:	monopsony:	to monopsony:	to monopsony:	monopsony:
ε	**b**	**a**	**Q_1**	**Q_2**	**Pg***	**PS_g**	**Pg***	**PS_g**	**PS_{monop}**	**DWL_{monop}**
0.1	0.0027	6.71	7.33	6.96	232.00	1629.61	92.00	629.00	974.40	26.20
0.2	0.0053	5.97	7.21	6.46	232.00	1528.49	92.00	571.69	904.40	52.41
0.3	0.0080	5.22	7.08	5.96	232.00	1427.38	92.00	514.37	834.40	78.61
0.4	0.0107	4.48	6.96	5.46	232.00	1326.27	92.00	457.05	764.40	104.81
0.5	0.0134	3.73	6.83	4.96	232.00	1225.15	92.00	399.74	694.39	131.02
0.6	0.0160	2.98	6.71	4.46	232.00	1124.04	92.00	342.42	624.39	157.22
0.7	0.0187	2.24	6.58	3.96	232.00	1022.92	92.00	285.11	554.39	183.43
0.8	0.0214	1.49	6.45	3.46	232.00	921.81	92.00	227.79	484.39	209.63
0.9	0.0241	0.75	6.33	2.96	232.00	820.70	92.00	170.47	414.39	235.83
1	0.0267	0.00	6.20	2.46	232.00	719.58	92.00	113.16	344.39	262.04
1.1	0.0294	-0.75	6.08	1.96	232.00	618.47	92.00	55.84	274.39	288.24
1.2	0.0321	-1.49	5.95	1.46	232.00	517.36	92.00	-1.48	204.39	314.44
1.3	0.0348	-2.24	5.83	0.96	232.00	416.24	92.00	-58.79	134.39	340.65
1.4	0.0374	-2.98	5.70	0.46	232.00	315.13	92.00	-116.11	64.39	366.85

As shown in Table 8.1, under both the cooperative structure and private monopsony, surplus decreases with an increase in elasticity, while deadweight loss increases.

As described earlier, at an inelastic supply such as 0.27, the private monopsony CBH maximizes profit at offering growers a bound price of VCg . However, as elasticity increases (more elastic supply), Table 8.2 shows the private monopsony is better off to provide growers with a price based on the profit maximizing formula, as it results in a higher supply from growers. The result is an increased grower surplus and private monopsony surplus, and a reduced deadweight loss when the profit maximizing formula is used to determine grower price for elasticity greater than 0.8.

Table 8.2: Welfare Analysis – Binding Private Monopsony Grower Price based on Supply Elasticity

Pw	279									
VCsc	47							Resulting		
VCg	92				Grower	Grower	Grower	grower	Resulting	Resulting
Q*	7.46				price	surplus	price	surplus moving	monopsony	deadweight
Pw-VCsc	232				under	under	under	from co-op	surplus moving	loss under
					cooperative:	cooperative:	monopsony:	to monopsony:	to monopsony:	monopsony:
ε	**b**	**a**	**Q_1**	**Q_2**	**Pg***	**PS_g**	**Pg***	**PS_g**	**PS_{monop}**	**DWL_{monop}**
0.1	0.0027	6.71	7.33	6.96	232.00	1629.61	92.00	629.00	974.40	26.20
0.2	0.0053	5.97	7.21	6.46	232.00	1528.49	92.00	571.69	904.40	52.41
0.3	0.0080	5.22	7.08	5.96	232.00	1427.38	92.00	514.37	834.40	78.61
0.4	0.0107	4.48	6.96	5.46	232.00	1326.27	92.00	457.05	764.40	104.81
0.5	0.0134	3.73	6.83	4.96	232.00	1225.15	92.00	399.74	694.39	131.02
0.6	0.0160	2.98	6.71	4.46	232.00	1124.04	92.00	342.42	624.39	157.22
0.7	0.0187	2.24	6.58	3.96	232.00	1022.92	92.00	285.11	554.39	183.43
0.8	0.0214	1.49	6.45	3.46	232.00	921.81	92.00	227.79	484.39	209.63
0.9	0.0241	0.75	6.33	3.16	232.00	820.70	100.50	196.50	416.13	208.06
1	0.0267	0.00	6.20	3.10	232.00	719.58	116.00	179.90	359.79	179.90
1.1	0.0294	-0.75	6.08	3.04	232.00	618.47	128.68	147.52	313.96	156.98
1.2	0.0321	-1.49	5.95	2.98	232.00	517.36	139.25	103.32	276.02	138.01
1.3	0.0348	-2.24	5.83	2.91	232.00	416.24	148.19	50.03	244.14	122.07
1.4	0.0374	-2.98	5.70	2.85	232.00	315.13	155.86	-10.42	217.03	108.52

8.4 Private Monopsony Regulation and Resulting Welfare

As discussed earlier, CBH is currently under the scrutiny of some industry players for its control of the supply chain. The expectation is that the ACCC will follow through

on its revocation of CBH's current exclusive dealing authority, where growers that use CBH's storage and handling services must also use its grain supply coordination and transport services. It can be expected that if CBH was altered to a private monopsony, pressure from industry players and regulators, such as the ACCC, would increase competition policy. It is therefore worthwhile to examine a possible example of competition regulation, such as regulating the total handling charges a private CBH monopsony could extract from growers.

The following compares the welfare impacts of converting the cooperative CBH which is setting grower price at world cost less the supply chain cost, into a private monopsony CBH providing growers a price equal to world price less a regulated amount. Suppose the regulated rates are 10% over the current costs. In this case the private CBH monopsony would only be allowed to earn a margin of 10%. Using the simulated starting values, with world price equal to $279 and the private CBH monopsony's actual variable cost of $47, the minimum price it could provide growers is $227 ($279 less $47 less 10% of $47). When comparing this to the unregulated private CBH monopsony, the result is an increase in grower surplus, and a decrease in the private CBH monopsony's surplus and the deadweight loss. Table 8.3 demonstrates the magnitude of these improvements. Deadweight losses at this regulated rate would be less than a million dollars. It is important to note however, that a private CBH monopsony would likely strive to achieve efficiencies, i.e. by reducing its actual variable costs, in this case lowering the $47, to increase profits. A cooperative CBH would pass those gains on to the growers; the private monopsony would not.

Table 8.3: Welfare Analysis – Regulated Minimum Grower Price for Private Monopsony

Pw		279									
VCsc		47							Resulting		
Min. Grower Price		227			Grower	Grower	Grower	Grower	grower	Resulting	Resulting
Q*		7.46			price	surplus	price	price under	surplus moving	monopsony	deadweight
Pw-VCsc		232			under	under	under	regulated	from co-op	surplus moving	loss under
					cooperative:	cooperative:	monopsony:	monopsony:	to monopsony:	to monopsony:	monopsony:
ε	**b**	**a**	**Q_1**	**Q_2**	**Pg**	**PS_g**	**Pg**	**Pg**	**PS_g**	**PS_{monop}**	**DWL_{monop}**
0.1	0.0027	6.71	7.33	7.32	232.00	1629.61	92.00	227.00	1592.97	36.60	0.03
0.2	0.0053	5.97	7.21	7.18	232.00	1528.49	92.00	227.00	1492.52	35.91	0.07
0.3	0.0080	5.22	7.08	7.04	232.00	1427.38	92.00	227.00	1392.06	35.21	0.10
0.4	0.0107	4.48	6.96	6.90	232.00	1326.27	92.00	227.00	1291.61	34.52	0.13
0.5	0.0134	3.73	6.83	6.76	232.00	1225.15	92.00	227.00	1191.16	33.82	0.17
0.6	0.0160	2.98	6.71	6.63	232.00	1124.04	92.00	227.00	1090.71	33.13	0.20
0.7	0.0187	2.24	6.58	6.49	232.00	1022.92	92.00	227.00	990.26	32.43	0.23
0.8	0.0214	1.49	6.45	6.35	232.00	921.81	92.00	227.00	889.80	31.74	0.27
0.9	0.0241	0.75	6.33	6.21	232.00	820.70	98.00	227.00	789.35	31.04	0.30
1	0.0267	0.00	6.20	6.07	232.00	719.58	113.50	227.00	688.90	30.35	0.33
1.1	0.0294	-0.75	6.08	5.93	232.00	618.47	126.18	227.00	588.45	29.65	0.37
1.2	0.0321	-1.49	5.95	5.79	232.00	517.36	136.75	227.00	488.00	28.96	0.40
1.3	0.0348	-2.24	5.83	5.65	232.00	416.24	145.69	227.00	387.54	28.26	0.43
1.4	0.0374	-2.98	5.70	5.51	232.00	315.13	153.36	227.00	287.09	27.57	0.47

Chapter 9 Conclusions

The Australian single-desk for wheat exports was removed July 1, 2008 - ending over 60 years of regulated wheat marketing in Australia through the Australian Wheat Board. The supply chain has begun to adapt to the new reality, but the transition from a single-desk system to an open market has only begun. The single desk has been replaced with a comprehensive set of government and industry regulations. Although roughly twenty six companies have been accredited to export Australian wheat, there are a few players that already have a substantial share of the market. Many of these already had a previous role in the supply chain of handling and marketing other crops, or in the case of the now corporate Australian Wheat Board (now called AWB), were an established seller in the world wheat market.

Although the bulk wheat export market is deregulated, in Western Australia, Co-operative Bulk Handling (CBH) has been described as a regional monopsony as it controls almost all of the up-country facilities and all four port terminals. Given that wheat accounts for the majority of winter crop production in Western Australia, and that almost all of the Western Australia wheat production is destined for export markets, deregulation has provided CBH with considerable opportunity in the marketing of this wheat. Currently, CBH is a fully grower owned, co-operative, however recently it has been considering altering its structure. Other Australian grain marketing and handling organizations have altered their structures, transforming from grower owned co-operatives to private firms. This is consistent with the co-operative life cycle theory which has described and predicted the changes made to other grain marketing and

handling companies in Australia. The co-operative life cycle theory states that managing co-operatives becomes increasingly difficult as the assets become more valuable and equity increases. This may lead to problems for CBH in the future, but hasn't lead to opposition of the current structure, which is more likely based on the need to raise capital. This study compares the price, quantity and welfare impacts on the Western Australian grower if the CBH as a co-operative was replaced with a private company with monopsony powers and no regulatory control.

The results from the theoretical model and simulations provided in this study clearly show the negative impacts on the Western Australian grower if CBH altered its structure to a privately held monopsony. This is not surprising as the best interests of the member growers is currently the focus of CBH, whereas in a non-grower owned structure, the interests of the shareholder take precedence. Performing a simulation on average values from the 2000-2004 crop years, the price Western Australia wheat growers would have received from a private CBH monopsony would have been $92 per tonne. This should be compared to the $232 per tonne actually received from the co-operative CBH. The quantity supplied by growers under a private CBH monopsony would have been 6.1 million tonnes, compared to the 7.1 million tonnes actually supplied under the co-operative CBH. The welfare impacts of moving from a co-operative to a private monopsony, results in a decrease in grower surplus, which equals to a transfer of surplus to the new private monopsony and a deadweight loss. However, as elasticity increases, it is no longer in the private monopsony's best interest to offer growers only a price equal to their variable cost, as using a price determined through the profit maximizing formula results in a higher surplus for the private monopsony.

If a privately held CBH was limited by regulations, say to hold its margin at just 10% above current costs, grower surplus would still not be as high as if the grower price was determined through a grower orientated co-operative CBH. Such regulations could vastly improve deadweight losses as long as they approached real system costs.

In reality, CBH does earn a profit, which it does not always distribute to its members but retains in order to provide capital for future endeavours, however it is dramatically less than what the theory in this study would calculate it to be if CBH was allowed to behave as an unregulated private monopsony. This confirms the conclusion that Western Australian wheat growers are better off with the current CBH co-operative structure, versus a private CBH unless it was heavily regulated to offset significant market power.

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