MOTIVES FOR THE VERTICAL INTEGRATION AND DIVERSIFICATION
OF THE WESTERN CANADIAN PRAIRIE POOLS

by

ANDREA LUISE HARRIS

B.A., The University of Calgary, 1991

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE STUDIES

(Department of Agricultural Economics)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

April 1995

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ABSTRACT

In recent years the three Prairie Pools have actively expanded their primary operations to include a number of investments both within and outside of the agricultural sector. The Pools' investment strategies are economically interesting because they are being pursued within the context of a co-operative organizational structure which requires that the users of the co-operative business also own, control, and benefit from its operations. This thesis examines the possible economic incentives agricultural co-operatives may have to invest in vertically integrated and diversified activities using the case of the Western Canadian co-operative elevator companies as an example.

The analysis undertaken in this thesis is structured in two ways. First, the economic literature regarding co-operative formation and conventional firm expansion is surveyed. This analysis suggests that an important difference between vertically integrated investments and diversified investments is that they are motivated by the realization of distinctly different sets of economic benefits for the co-operative firm and its members. It is argued that co-operative vertical integration can convey benefits to members indirectly through the market, in the form of increased producer margins and improved market access. However, these benefits may not impact the “bottom line” of the co-operative firm. Diversification can, on the other hand, provide a co-operative with direct monetary benefits in the form of improved financial performance and increased profits, which can translate into increased patronage refunds available to members.

The second component of this analysis involves the development of a simulation model to examine the implications of an additional hypothesis proposed to explain co-operative expansion. The proposed hypothesis is based on the notion that perhaps the indirect market benefits from co-operation and co-operative expansion are being undervalued. This undervaluation can result in a
preoccupation with the monetary benefits from co-operative business, and may therefore cause a bias towards diversified investments. The model developed in this thesis illustrates that, although such a bias may improve a co-operative's rate of return, it may also result in significant opportunity costs for agricultural producers due to a decrease in a co-operative's pro-competitive effect on primary markets.
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ACKNOWLEDGEMENT

I would sincerely like to thank the members of my thesis committee: Mary Bohman, for her sound advice and helpful comments; Murray Fulton, for his continued encouragement and insight; and especially James Vercammen, for his excellent guidance and support. The support and assistance from the other faculty members and staff, particularly Kathy and Retha, in the department of agricultural economics is also very much appreciated. As well, I would like to thank my classmates, for the cherished friendships and invaluable understanding, and John Irvine, my pillar throughout.
CHAPTER 1: INTRODUCTION

1.1 PROBLEM SETTING

The Western Canadian grain handling industry has witnessed extensive structural change in recent years. This structural change is largely the result of significant changes in grain handling technologies, global demand factors, and government regulations affecting the transportation and marketing of western grain (Furtan et al. 1989; Tryon 1993). In response to these shifts, many of the primary elevator companies have rationalised and consolidated their primary operations, while at the same time expanding their overall operations to include a wide variety of secondary activities.

The three Prairie Pools (Saskatchewan Wheat Pool, Alberta Wheat Pool, and Manitoba Pool Elevators), have been no exception, and have actively broadened their operations to include numerous investments outside of primary grain handling. The bulk of these investments have occurred within the grain production and marketing system as a form of vertical integration. These investments have included activities such as fertilizer distribution, and oilseed, bean, and mustard processing. Recently, the Pools have also begun to invest in areas where the links to the agricultural sector are no longer as clear. Examples of these diversified investments include activities in the oil and gas industry and the production of health and beauty products.

The Pools’ investments in secondary activities have not only increased in number and variety, but their significance on the financial structure of these companies has also become more important. For example, in 1984, 7% of the net earnings of the Saskatchewan Wheat Pool were generated from associated co-operatives (13 in number), while country services, including earnings from primary elevator operations and farm supply sales, generated 30% of net earnings.
In 1994, however, the associated companies of SWP (made up of 27 co-operative and non-cooperative firms) contributed $19.7 million dollars to total net earnings, accounting for 39% of total revenue. The earnings from the country services division, on the other hand, contributed $7 million dollars, accounting for only 14% of net earnings.

The Pools investment strategies are economically interesting not only because of their financial significance, but also because they are being pursued within the context of a co-operative organizational structure. A co-operative structure is unique in that co-operative members not only do business with their co-operatives, but also own and control them. These features often provide co-operative members a means through which market access can be improved and some of the market failures commonly found in the agricultural sector can be addressed.

Despite these benefits, however, the co-operative structure can also impose constraints upon a firm's business operations. Co-operative theorists have recognised that one of the key issues facing co-operatives today is capital scarcity (Staatz 1987; Schrader 1989b; Peterson 1992). This scarcity makes the Prairie Pools decision to expand investments in secondary operations a critical one, due to the significant opportunity costs involved in the allocation of co-operative capital. Although many motives for expansion, such as efficiency gains, added services, and increased revenues, may exist, the financial resources to undertake such ventures may not.

1.2 PROBLEM STATEMENT

The rapid pace of vertical integration and diversification of agricultural co-operatives has raised several important issues regarding their changing role in an expanded business environment (Bohman and Vercammen 1993; Vercammen 1993). Some of the issues discussed include the lack of a performance measure for associated enterprises since co-operative capital is not explicitly valued in capital markets, difficulties in assessing member preferences for various
investment alternatives, and inefficiencies in allocating earnings from expanded operations. There is also the issue of whether the relatively rigid organisational structure of a co-operative is compatible with highly diversified business operations.

Part of the difficulty involved in analysing the issues surrounding co-operative vertical integration and diversification lies in understanding the motives behind expansionary business strategies. The economic rationale for a vertically integrated expansion strategy differs significantly from that of a diversified strategy. Therefore, by distinguishing vertically integrated investments from diversified investments, and by examining the different motives behind the two investment strategies, the implications of co-operative expansion can be further examined.

Agricultural co-operatives are themselves often viewed as a form of vertical integration for producers. Vertical integration through co-operation can increase producer’s market power, their access to markets, and the degree of market competitiveness. Therefore, further integration by a co-operative may simply be a means through which farmers can extend the market benefits initially sought through co-operation. However, the pursuit of such market benefits on behalf of members may not necessarily result in increased profits or improved financial performance for the co-operative firm.

A similarly consistent framework for assessing the motives for co-operative diversification does not exist. The conventional theories regarding diversification commonly focus on the significant impact that diversified investments can have upon a firm’s “bottom line”. Diversified investments can serve to stabilize and increase the financial returns generated by a firm’s overall operations. As a result, diversification may provide direct monetary benefits, in the form of improved financial performance and increased profit levels, for a co-operative firm and its members. The extent to which the market and monetary benefits from co-operation are valued
differently by various co-operative players can give rise to important opportunity costs associated with the allocation of scarce co-operative capital. Furthermore, the undervaluation of the market benefits from co-operation could provide an additional motive for diversification.

1.3 OBJECTIVES

The overall objective of this thesis is to examine the integration and diversification strategies of the Prairie Pools, the economic motives behind these decisions, and the possible implications of these activities for co-operative organizations and their members. A specific objective is to examine in detail, through the development of a mathematical model, the notion that an agricultural co-operative’s preoccupation with financial performance can result in a bias towards diversified investments, and that this bias may have a significant impact upon the well-being of agricultural producers.

1.4 THESIS OVERVIEW

The thesis begins in chapter 2 with a description of the prairie grain handling industry in section 2.1, and an overview of the structural changes faced by this industry in section 2.2. As well, a description of the Prairie Pools general response to these changes is presented in section 2.3. In Chapter 3 the organizational objectives of the Prairie Pools are described by distinguishing co-operatives from other forms of business organization. This is accomplished by: defining co-operative organizations in section 3.1; describing some of the benefits and problems associated with co-operation in sections 3.2 and 3.3; and then briefly discussing how these characteristics have been incorporated into economic theory in section 3.4.

In chapters 4, 5, and 6, the motives behind, and the implications of, the Prairie Pools expansion activities are analysed in detail. Chapter 4 is devoted to an examination of co-operative
vertical integration. To begin, some of the various theories offered by the industrial organization
literature and the co-operative development literature are discussed in section 4.1 and section 4.2.
In section 4.3 these theories are then applied to the case of the Prairie Pools, and some
conclusions are drawn as to the possible incentives for further integration by co-operatives. Also,
some of the conclusions from previous studies regarding co-operative vertical integration are
discussed in this section.

Chapter 5 provides an analysis of co-operative diversification. In section 5.1 the
alternative methods of co-operative investment in diversified activities are discussed, and in
section 5.2, the conventional theories of the firm are used to examine the diversification of the
Prairie Pools. An additional hypothesis is then developed in section 5.3 to further explain why a
cooporative may choose to diversify. This hypothesis is based upon the notion that the market
benefits from vertically integrated investments are distinct from the monetary benefits from
diversification, and as such, may be valued differently by various co-operative interests. A
simulation model is constructed in section 5.4 to further support this hypothesis and to illustrate
the opportunity costs associated with a co-operative's capital investment decision. An oligopoly
scenario is chosen as it resembles the prairie grain handling market, and clearly identifies the
potential trade-offs involved in allocating co-operative capital.

Chapter 6 further examines the possible implications of co-operative diversification and
the proposed hypothesis, by presenting the simulation results of two separate model scenarios
(each based on different cost assumptions) in sections 6.1 and 6.2. Both scenarios are analysed by
comparing a situation in which co-operative member welfare is maximized to a situation where a
bias towards diversification is proposed to exist. Chapter 7 concludes the thesis by: providing a
summary in section 7.1; briefly discussing some of the limitations of the study and suggesting areas for future research in section 7.2; and summarizing the major conclusions in 7.3.
CHAPTER 2: OVERVIEW OF CANADIAN PRIMARY GRAIN HANDLING

2.1 PRIMARY GRAIN HANDLING IN WESTERN CANADA

2.1.1 Industry Players

The Western Canadian grain handling industry consists primarily of four different types of players: the Canadian Grain Commission; the Canadian Wheat Board (CWB); the railways; and the various grain handlers. The handling, transportation, and storage of grains is regulated by the Canadian Grain Commission, a government body. The CWB is a grain marketing agency funded by Western Canadian farmers which has exclusive marketing jurisdiction over wheat and barley grown in Western Canada and destined for export or domestic human consumption. The CWB contracts with elevator companies to handle the grain it markets both domestically and abroad. Two railways provide grain transportation services between primary and terminal elevators; Canadian Pacific, a public company, and Canadian National, a crown corporation (Bass 1993).

The most important grain handlers are the grain elevator companies. The principle activity of the elevator companies is to provide the handling services needed to get grain, oilseeds, and other Prairie crops to market. They operate primary elevators which are usually located at delivery points on railway lines throughout Western Canada, and in many cases, also operate terminal elevators at export positions. In addition to handling CWB wheat and barley, they also provide storage services and market other grains such as oats, canola, flax, and speciality crops which are not marketed by the CWB.

The primary handling services offered by the elevator companies form the source of several different types of income. Earnings accrue from the receiving, elevating, cleaning, drying, shipping, and resale of grain and other crops. Elevation charges are the most important primary source of
income for grain elevators, as storage charges are not levied until after an initial 10-day grace period.

The rates for elevation, storage, drying, cleaning, and shipping are subject to a maximum rate which is set annually by the Canadian Grain Commission, as decreed by the Canada Grain Act of 1912. Until 1973, the maximum rates were the operating rates. However in 1974 the Commission began encouraging companies to price competitively, thus accounting for the tariff differences between elevator companies today (Tryon 1993).

During the 1992-93 crop year the Canadian primary elevator system consisted of 1,465 elevators across Canada, with a storage capacity of 6,921,100 tonnes of grain (Canadian Grain Commission 1994). Table 2.1, presents the distribution and capacity of primary grain elevators throughout Western Canada as of August 1, 1993.

Table 2.1: Number and Capacity of Primary Grain Elevators by Province

<table>
<thead>
<tr>
<th>Province</th>
<th>Number</th>
<th>Capacity (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manitoba</td>
<td>254</td>
<td>1,083,690</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>759</td>
<td>3,410,150</td>
</tr>
<tr>
<td>Alberta</td>
<td>442</td>
<td>2,361,350</td>
</tr>
<tr>
<td>B.C.</td>
<td>10</td>
<td>65,910</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,465</td>
<td>6,921,100</td>
</tr>
</tbody>
</table>


At the present time six companies dominate the primary elevator industry in Canada, and have done so since the early 1970's. As is indicated in Table 2.2, the largest grain companies in Canada include the three Prairie Pools, made up of the Saskatchewan Wheat Pool (SWP), the Alberta Wheat Pool (AWP), and Manitoba Pool Elevators (MPE). The Prairie Pools in total, operate 57% of Canadian primary elevators, and handle approximately 60% of the six major grains produced in western Canada. The three other major players are Cargill, Ltd, and the Pioneer Grain Company, Ltd.,
which are privately owned, and United Grain Growers, Ltd., a publicly traded company. Two
additional companies, Parrish and Heimbecker, Ltd. and Paterson and Sons, Ltd., operate 27 and 48
elevators respectively, while the remaining companies operate 5 or less elevators and handle mostly
specialty crops.

Table 2.2 also illustrates the regional pattern of the elevator companies’ operations. The
Prairie Pools only operate primary elevators in their respective provinces, with the exception of AWP
which also operates elevators in the Peace River region of British Columbia. The bulk of the elevators
controlled by the Pioneer Grain Company are located in Saskatchewan, while the operations of
Paterson and Sons, Ltd., and Parrish and Heimbecker, Ltd., are evenly allocated across two of the
three prairie provinces. United Grain Growers and Cargill are notable exceptions as they operate in all
four provincial regions. Therefore, although a number of handling companies compete within Western
Canada, the degree of competition within regional or provincial markets is relatively low.

Table 2.2 Licensed Primary Grain Elevators by Province and Company

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Manitoba</th>
<th>Saskatchewan</th>
<th>Alberta</th>
<th>B.C.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta Wheat Pool</td>
<td>-</td>
<td>-</td>
<td>259</td>
<td>4</td>
<td>263</td>
</tr>
<tr>
<td>Cargill Limited</td>
<td>17</td>
<td>40</td>
<td>26</td>
<td>3</td>
<td>86</td>
</tr>
<tr>
<td>Manitoba Pool Elevators</td>
<td>135</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>135</td>
</tr>
<tr>
<td>Parrish &amp; Heimbecker, Ltd.</td>
<td>1</td>
<td>12</td>
<td>14</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Paterson &amp; Sons, Ltd.</td>
<td>25</td>
<td>22</td>
<td>1</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td>Pioneer Grain Company, Ltd.</td>
<td>7</td>
<td>137</td>
<td>41</td>
<td>1</td>
<td>186</td>
</tr>
<tr>
<td>Saskatchewan Wheat Pool</td>
<td>-</td>
<td>439</td>
<td>-</td>
<td>-</td>
<td>439</td>
</tr>
<tr>
<td>United Grain Growers, Ltd.</td>
<td>59</td>
<td>101</td>
<td>97</td>
<td>2</td>
<td>259</td>
</tr>
<tr>
<td>Other Licensed Companies</td>
<td>10</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>TOTAL</td>
<td>254</td>
<td>759</td>
<td>442</td>
<td>10</td>
<td>1465</td>
</tr>
</tbody>
</table>

2.1.2 The Prairie Pools

The three Prairie Pools were individually founded in the early 1920s in response to dissatisfaction with a grain marketing system characterized by unstable prices due to irregularities in supply and demand. The fluctuations in the market price for grains was further aggravated by a highly speculative commodities market and an abundance of middle men. The desire of producers to minimize their risk, stabilize prices, and increase their ability to bargain with grain buyers, led to the formation of an alternative marketing system based on pooling. The Pools were established to act as a voluntary central marketing agency for grain. They purchased grain from farmers at an initial price, upon delivery to the elevator, and a final payment, on the basis of sales, was made to farmers at year-end if any surplus remained. This system provided all participating producers with the same price, eliminating much of the volatility in the market and reducing the number of middlemen. The handling of "Pool Wheat" was originally contracted out to existing grain handling companies, however, within a few years, the three Pools began to buy and build primary elevators themselves (Fowke 1957; Fairbairn 1984).

The Pools prospered for the first six years after their formation, however, they faced near financial disaster with the collapse of international wheat prices in 1929 and the onslaught of the depression in 1930. When the price of wheat fell below the price already contracted with farmers during the 1929-30 crop year, the government provided the Pools with loans (later repaid in full) to cover their losses and avoid foreclosure. This experience led the Pools to decide (in 1931) to abandon the pooling of wheat and other grains in favour of operating as separate co-operative grain handlers. However, the Pools and their members continued to jointly lobby the federal government for the re-establishment of a compulsory grain marketing board (two boards had previously been established during World War I but were later disbanded). These efforts led to
the formation of the Canadian Wheat Board in 1935. The CWB began as an optional alternative to the open market and was eventually granted exclusive marketing rights over wheat, barley, and oats in 1949 (Fowke 1957; Canadian Wheat Board 1993).

Today the Prairie Pools have grown to become three of the largest agricultural firms in Canada. The Saskatchewan Wheat Pool is the largest of the three Pools and was ranked 64th out of the top 500 Canadian firms in 1992, with $1.87 billion dollars in sales. The Alberta Wheat Pool ranked 119 with $1 billion dollars in sales in 1992, and Manitoba Pool Elevators, ranked 187 with $0.5 billion in sales (Financial Post 500 1993: Summer). The three Pools have continued to actively lobby the government in support of single-desk selling and other policy issues affecting the welfare of prairie grain producers, such as transportation and income security (Fulton and Laycock 1990).

2.2 STRUCTURAL CHANGE IN PRIMARY GRAIN HANDLING

Substantial structural change has characterized the primary grain handling industry over the past 30 years, starting with a sudden increase in foreign demand for Canadian grains in the 1960s, due to Russia's entry into the market (Furtan et al. 1989). To receive and ship more grain, the primary elevator companies needed to shift from being primarily storage-oriented to being throughput-oriented. This resulted in an unprecedented rate of elevator closures by the handling companies in order to eliminate inefficient low-volume delivery points, and release capital needed to invest in high capacity elevators and improved equipment.

Government regulations regarding both the transportation and marketing of grain were also adjusted to support the structural changes required by the industry in order to meet global demand. In 1969 the Block Shipping System was introduced, which allocated rail cars geographically among elevator companies according to the types of grain being shipped. The Canadian Wheat Board also
instituted changes in its quota system, allowing for more control over the quantity and quality of grain flowing through the primary elevator system (Tryon 1993).

Today, regulatory changes continue to impact the grain handling industry. Most notably, with the increased focus on trade liberalisation, the CWB has witnessed a steady erosion in its marketing powers. As was mentioned, the CWB had sole marketing authority over all grades of wheat, barley, and oats in 1949. However, in 1974 producers were given the option to sell feed grains on the domestic market, and in 1989 oats were also removed from CWB jurisdiction (Canadian Wheat Board 1993). Currently an on-going dispute exists concerning whether barley destined for United States markets should continue being sold through the CWB (Brooks 1993; Carter 1993; Gray, Ulrich, and Schmitz 1993; Veeman 1993; Carter 1994).

The move towards deregulation has also had a significant impact on transportation policies. The initial establishment of the Crow rate in 1925 allowed producers to face fixed statutory rates based strictly on distance (irrespective of rail service demand) for the transportation of Prairie grains. However, with the introduction of the Western Grain Transportation Act (WGTA) in 1984, producers and railways companies, rather than the government, are now paying an increased share of the true costs of grain transportation (Tryon 1993). These changes have led to the abandonment of numerous branchlines, and the increased use of alternative forms of transport, such as trucking.

Clearly, all of these structural changes have had a profound impact on the primary elevator configuration of Western Canada. As mentioned, one of the most significant implications has been the high degree of elevator closures, illustrated in Table 2.3. Small inefficient elevators have been closed to reduce operating costs and allow for the introduction of new high-volume elevators. Furthermore, the rationalisation of the primary elevator system has resulted in a marked reduction in the level of competition at delivery points. For example, the percentage of
competitive delivery points (delivery points serviced by more than one grain handling company) dropped from 62.8% in 1965 to 41.1% in 1992 (Canadian Grain Commission 1966; Canadian Grain Commission 1993).

Table 2.3 Historical Record of Primary Elevators in Canada

<table>
<thead>
<tr>
<th>Crop Year</th>
<th>Number of Elevators</th>
<th>Capacity (Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963-64</td>
<td>5,187</td>
<td>10,327,160</td>
</tr>
<tr>
<td>1973-74</td>
<td>4,383</td>
<td>10,306,190</td>
</tr>
<tr>
<td>1983-84</td>
<td>2,800</td>
<td>8,035,480</td>
</tr>
<tr>
<td>1993-94</td>
<td>1,465</td>
<td>6,921,100</td>
</tr>
</tbody>
</table>


2.3 PRAIRIE POOLS RESPONSE TO STRUCTURAL CHANGE

The structural changes facing the grain handling industry have combined to bring about dramatic changes in the operations of the co-operative grain handlers. Like their competitors, the Pools have invested heavily in high-technology elevators, while at the same time consolidating and rationalising their primary operations. Table 2.4 compares the primary elevator configuration of co-operatives versus investor-oriented firms (IOFs or non-cooperative firms) for the 1985 and 1992 crop years. As the table illustrates, the co-operative grain handlers have reduced the number of low-capacity elevators (less than 5000 tonnes) and have increased the number of high-throughput elevators, at a rate comparable to their IOF competitors. The co-operatives have lagged behind investor-oriented firms, however, in terms of increased investment in high-throughput elevators with a capacity of over 10,000 tonnes (some of the reasons for this lag will be discussed in the following chapter).
Table 2.4 Primary Elevator Configuration: 1985 vs. 1992

<table>
<thead>
<tr>
<th>Number of Primary Elevators:</th>
<th>Total</th>
<th>&lt;5000</th>
<th>5001-10,000</th>
<th>&gt;=10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985 Crop Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-operatives</td>
<td>1417 (100%)</td>
<td>1062 (75%)</td>
<td>341 (24%)</td>
<td>14 (1%)</td>
</tr>
<tr>
<td>IOFs</td>
<td>523 (100%)</td>
<td>424 (81%)</td>
<td>85 (16%)</td>
<td>14 (3%)</td>
</tr>
<tr>
<td>1992 Crop Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-operatives</td>
<td>1122 (100%)</td>
<td>789 (70%)</td>
<td>311 (28%)</td>
<td>22 (2%)</td>
</tr>
<tr>
<td>IOFs</td>
<td>372 (100%)</td>
<td>247 (66%)</td>
<td>104 (28%)</td>
<td>21 (6%)</td>
</tr>
</tbody>
</table>


Structural changes in the industry have also motivated many of the grain handlers to expand their overall operations to include a wide variety of vertically linked and diversified investments. Again, the Pools have been no exception and have each invested in a broad range of secondary activities. To illustrate, table 2.5 traces the investments of the Alberta Wheat Pool since its formation in 1923. Beginning in the 1950s and 1960s the Pools began to broaden their operations by investing in producer input markets and merchandising farm supplies at producer delivery points. During this time AWP expanded by investing in seed and fertilizer operations, and in the early 1960s entered into a partnership with other co-operatives to manufacture fertilizer. As a result of the Pools' investments in input merchandising, the "agricultural service centre" concept emerged as a competitive factor in the system, which today contributes a significant portion of overall Pool revenue. For example, the farm service division generated 210 million dollars in sales in 1994 for the Alberta Wheat Pool alone (AWP Annual Report 1994).

In the 1970s and early 1980s the Pools expanded to include various processing operations. For example, the Alberta Wheat Pool began investing in canola crushing in 1974, and in 1982 became the
sole owner of a canola crushing plant at Fort Saskatchewan (Alberta Food Products, which it later sold in 1987). The early 1990s saw further investments in the direction of retail markets through the addition of value-added processes. Examples from AWP’s investment record include: the company’s partial ownership (50%) of the Drummond Brewing Company, Ltd., a regional brewery located in Red Deer; the full ownership of Prairie Sun Grains (located in Camrose, AB) which processes high quality wheat and flour and produces pancake mixes; and the full purchase of the Demeter Group of Companies of Warner, AB, involved in the grinding, processing, and marketing of mustard.

The expansion of the Prairie Pools’ operations over the years have included several different methods of investment. Some of the investments have been achieved through organizational alliances while others have involved external changes. Organizational alliances require co-ordination with other independent businesses, either co-operatives or investor-oriented firms, and are achieved through joint ventures, marketing agents, holding companies, or contract agents. Mergers, consolidations, or acquisitions are examples of external changes, referring to investments made by the amalgamation of companies or the selling off of existing operations (Vilstrop, Cobia, and Cropp 1989).
Table 2.5 Alberta Wheat Pool - Historical Record of Investments

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923</td>
<td>Formation of the Alberta Wheat Pool</td>
</tr>
<tr>
<td>1950s</td>
<td>Seed and fertilizer marketing</td>
</tr>
<tr>
<td>1960s</td>
<td>Fertilizer manufacturing</td>
</tr>
<tr>
<td></td>
<td>- Western Co-operative Fertilizers Ltd. (Pool joint-venture)</td>
</tr>
<tr>
<td></td>
<td>Herbicide marketing</td>
</tr>
<tr>
<td>1970s</td>
<td>Overseas Grain Trading</td>
</tr>
<tr>
<td></td>
<td>- XCAN Grain Ltd. (Pool joint-venture)</td>
</tr>
<tr>
<td></td>
<td>Terminal Facilities</td>
</tr>
<tr>
<td></td>
<td>- Purchase of Federal Grain Co. and Pacific Elevators Ltd.</td>
</tr>
<tr>
<td></td>
<td>Canola Crushing</td>
</tr>
<tr>
<td></td>
<td>- Japan Alberta Oil Mill Co. (IOF joint-venture)</td>
</tr>
<tr>
<td>1980s</td>
<td>Divest Canola Crushing facilities</td>
</tr>
<tr>
<td></td>
<td>- Sale of Alberta Food Products</td>
</tr>
<tr>
<td>1990s</td>
<td>Flour Milling</td>
</tr>
<tr>
<td></td>
<td>- Prairie Sun Grains (sole owner)</td>
</tr>
<tr>
<td></td>
<td>Brewing</td>
</tr>
<tr>
<td></td>
<td>- Drummond Brewing Company Ltd. (IOF joint-venture)</td>
</tr>
<tr>
<td></td>
<td>Mustard Grinding and Processing</td>
</tr>
<tr>
<td></td>
<td>- Demeter Inc. (sole owner)</td>
</tr>
<tr>
<td></td>
<td>- Alberta Industrial Mustard Company (IOF joint-venture)</td>
</tr>
</tbody>
</table>


The investments of Manitoba Pool Elevators and the Saskatchewan Wheat Pool are presented in tables 2.6 and 2.7 respectively. The two tables clearly indicate that, in addition to their primary operations, both Pools solely own and partially own many different companies. For MPE this is almost wholly the result of strategic alliances formed with other co-operative organizations. Most of MPE's investments are in the form of joint-ventures with one or both of the remaining Prairie Pools. Examples of such investments include: Western Co-operative Fertilizers, which distributes fertilizers for all three Pools; XCAN, a speciality grain exporting company for the Pools; and CSP Foods, a food processing company jointly owned with SWP.
Table 2.6 Manitoba Pool Elevators Investments

<table>
<thead>
<tr>
<th>Manitoba Pool Elevators Investments</th>
<th>Ownership %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool Joint-Ventures:</td>
<td></td>
</tr>
<tr>
<td>Canadian Pool Agencies Ltd.</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>CSP Capital Corporation</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>Interprovincial Co-operative Ltd.</td>
<td>3.6%</td>
</tr>
<tr>
<td>MAALSA Investments Ltd.</td>
<td>20%</td>
</tr>
<tr>
<td>Pacific Elevators Limited</td>
<td>10%</td>
</tr>
<tr>
<td>Pool Insurance Company</td>
<td>20%</td>
</tr>
<tr>
<td>SM Prairie Management</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>Western Co-operative Fertilizers Limited</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>Western Pool Terminals Ltd.</td>
<td>10%</td>
</tr>
<tr>
<td>XCAN Grain Pool Ltd.</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>Investments with Other Co-operatives:</td>
<td></td>
</tr>
<tr>
<td>Co-operators Group Ltd.</td>
<td></td>
</tr>
<tr>
<td>Federated Co-operatives Ltd.</td>
<td></td>
</tr>
<tr>
<td>Prince Rupert Grain Consortium</td>
<td></td>
</tr>
<tr>
<td>Investments with Investor-oriented Firms:</td>
<td></td>
</tr>
<tr>
<td>Can-Oat Milling Products Ltd.</td>
<td></td>
</tr>
</tbody>
</table>


In contrast, many of the companies partially owned by SWP are strategic partnerships with IOFs. Examples include: Prairie Malt Ltd., which produces malt for the brewing industry and is a joint-venture with the Schreier Malting Company of Wisconsin; Pound-Maker Agventures Ltd., an integrated feedlot and ethanol plant, owned in partnership with Pound-Maker Investments Ltd., of Saskatchewan and Mohawk Oil of Vancouver; and Dawn Foods Canada, which produces fondants, icings, toppings, filling and pie fillings, and is owned in conjunction with Dawn Foods Products Inc., of Michigan. SWP’s strategic alliances also include investments in: holding companies, such as AgPro Grain Holdings Inc.; venture capital corporations, such as SWP Venture Capital Corporation; and contract agents, such as Pacific Elevators Limited which is managed under contract by AWP.
Table 2.7 Saskatchewan Wheat Pool Investments

<table>
<thead>
<tr>
<th>Saskatchewan Wheat Pool Investments</th>
<th>Ownership %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated Companies:</td>
<td></td>
</tr>
<tr>
<td>AgPro Grain Inc.</td>
<td>100%</td>
</tr>
<tr>
<td>AgPro Grain (US) Inc.</td>
<td>100%</td>
</tr>
<tr>
<td>AgPro Grain Holdings (US) Inc.</td>
<td>100%</td>
</tr>
<tr>
<td>CSP Capital Corporation</td>
<td>66 2/3%</td>
</tr>
<tr>
<td>SM Prairie Management Ltd.</td>
<td>66 2/3%</td>
</tr>
<tr>
<td>InfraReady Products Ltd.</td>
<td>100%</td>
</tr>
<tr>
<td>Burnt Lake Livestock Mart Ltd.</td>
<td>100%</td>
</tr>
<tr>
<td>605056 Saskatchewan Ltd. (Dawn Foods)</td>
<td>100%</td>
</tr>
<tr>
<td>605058 Saskatchewan Ltd. (Dawn Foods)</td>
<td>100%</td>
</tr>
<tr>
<td>SWP Venture Capital Corporation</td>
<td>91.9%</td>
</tr>
<tr>
<td>Significantly Influenced Companies:</td>
<td></td>
</tr>
<tr>
<td>Bioriginal Food &amp; Science Corp.</td>
<td>20.8%</td>
</tr>
<tr>
<td>Canadian Pool Agencies Ltd.</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>CanAmera Foods</td>
<td>33 %</td>
</tr>
<tr>
<td>CF Edible Oils Inc.</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>DF Foods Mfg. Inc.</td>
<td>50%</td>
</tr>
<tr>
<td>Dawn Foods Canada</td>
<td>49.5%</td>
</tr>
<tr>
<td>MAALSA Investments Ltd.</td>
<td>40%</td>
</tr>
<tr>
<td>Northco Foods Limited</td>
<td>35%</td>
</tr>
<tr>
<td>Pacific Elevators Limited</td>
<td>30%</td>
</tr>
<tr>
<td>Pool Insurance Company</td>
<td>50%</td>
</tr>
<tr>
<td>Pound-Maker Agventures Ltd.</td>
<td>22%</td>
</tr>
<tr>
<td>Prairie Malt Limited</td>
<td>42.4%</td>
</tr>
<tr>
<td>PrintWest Communications Ltd.</td>
<td>56.9%</td>
</tr>
<tr>
<td>Saskatoon Livestock Sales Ltd.</td>
<td>25%</td>
</tr>
<tr>
<td>Western Co-operative Fertilizers Limited</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>Western Pool Terminals Ltd.</td>
<td>30%</td>
</tr>
<tr>
<td>XCAN Grain Pool Ltd.</td>
<td>33 1/3%</td>
</tr>
</tbody>
</table>


A number of SWP’s investments can also be classified as external changes. These investments include SWP’s consolidated companies, such as AgPro Grain Inc. (a wholly owned subsidiary independently offering cleaning, drying, and special crops marketing) and InfraReady Products Ltd. (an infrared heat plant which processes raw cereals, legumes and oilseeds). In addition, SWP’s diversification through the acquisition of shares in other companies are also external changes.

Examples of the companies included in SWP’s share holdings are: Northco Foods Ltd., the parent
company of the Robin's Donuts chain; Bioriginal Food and Science Corp., which develops and markets food products, vitamin supplements, and health and beauty products; and PrintWest Communications Ltd., operating in the printing and graphic arts industries. The one non-cooperative venture of MPE is also a minority interest acquisition in Can-Oat Milling Products Ltd., which operates an oat processing plant.

The structural changes facing the grain handling industry in recent years have significantly affected the operations of the Prairie Pools, and have subsequently been a driving force behind their substantial investment activities. These investment activities cover a wide variety of areas and are accomplished through a number of different investment methods. However, a description of the structural changes facing an industry alone cannot explain the expansion strategies of firms. Such changes rather, signal the existence of market imbalances which can translate into economic incentives for firms, both co-operative and non-cooperative, to expand. In the following chapters the underlying motives for the Prairie Pools' decisions to expand their operations through integrated and diversified investments will be explored in greater detail. However, to provide a framework for this analysis, the unique characteristics of co-operatives versus other forms of business organizations will first be discussed.
CHAPTER 3: CO-OPERATIVES: A THEORETICAL OVERVIEW

In the previous chapter the operations of the three Prairie Pools were introduced. It was mentioned that the three co-operatives were formed to enable producers to overcome various failures previously characterizing the Canadian grain markets. However, little mention was made regarding how the structure of co-operatives can enable producers to overcome such market failures. The focus of this chapter is to define co-operative organizations, outline the economic benefits and problems associated with co-operation, and briefly review the theory developed to support these concepts.

3.1 CO-OPERATIVE PRINCIPLES

To better understand the behaviour of co-operatives in a market orientated economy it is useful to define co-operatives and distinguish them from other types of business organizations, namely investor-oriented firms (IOF). The key feature of co-operatives versus IOFs is their promotion and adherence to a set of principles. This set of principles reflects the co-operative philosophy, and to a great extent, defines the role and nature of co-operatives.

Several different "sets" of co-operative principles exist, as they have changed through time to reflect the dynamic nature of the co-operative form of organization and the co-operative movement. The original set of "Rochdale Principles" were formalised by the weavers of Rochdale, England who are attributed with having started the first successful consumer co-operative in 1844. In this century, however, the most globally influential set of principles are those formally ordered and adopted as the standard guidelines for accepted co-operative behaviour by the International Co-operative Alliance (ICA) in 1966. These six general principles are outlined in Figure 3.1. They are characteristic of "traditional" co-operatives and are the most commonly referenced source, although they have been subject to scrutiny by many co-operative observers (Barton 1989; Fairbairn 1994).
## International Co-operative Alliance - Six Basic Principles of Co-operation

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Open and Voluntary Membership</strong></td>
<td>Membership in a co-operative should be voluntary and available without artificial restriction or any social, political or religious discrimination to all persons who can make use of its services and who are willing to accept responsibilities of membership.</td>
</tr>
<tr>
<td><strong>2. Democratic Control</strong></td>
<td>Co-operatives are democratic organizations. Their affairs should be administered by persons elected or appointed in a manner agreed by the members and accountable to them. Members of primary co-operatives should enjoy equal rights of voting (one member - one vote) and participation in decisions affecting their organizations. In other than primary co-operatives the administration should be conducted on a democratic basis in a suitable form.</td>
</tr>
<tr>
<td><strong>3. Limited Interest on Shares</strong></td>
<td>Share capital should receive only a strictly limited rate of interest, if any.</td>
</tr>
<tr>
<td><strong>4. Return of Surplus to Members</strong></td>
<td>Surplus or savings, if any, arising out of the operations of a co-operative belong to members and should be distributed in such a manner as would avoid one member gaining at the expense of others. This may be done by decision of the members as follows:</td>
</tr>
<tr>
<td></td>
<td>a) by provision for development of the business of the co-operative;</td>
</tr>
<tr>
<td></td>
<td>b) by provision of common services; or</td>
</tr>
<tr>
<td></td>
<td>c) by distribution among the members in proportion to their transactions with the co-operative.</td>
</tr>
<tr>
<td><strong>5. Co-operative Education</strong></td>
<td>All co-operatives should make provision for education of their members, officers and employees, and of the general public in the principles and techniques of co-operatives, both economic and democratic.</td>
</tr>
<tr>
<td><strong>6. Co-operation Among Co-operatives</strong></td>
<td>All co-operatives in order to best serve the interests of their members and their communities, should actively collaborate in every practical way with other co-operatives at local, national and international levels.</td>
</tr>
</tbody>
</table>


Figure 3.1 International Co-operative Alliance: Co-operative Principles (1966)

Some agricultural economists have felt that the ICA set of principles includes practices or actions carried out to support co-operative principles, and focuses more on the principles of sound business management rather than defining the unique character of co-operatives. For example, the concepts of "limited returns to equity capital", "operation at cost", and "democratic control" were felt to describe co-operative behaviours which are operational applications of principles, and not principles in themselves (Staatz 1987; Dunn 1988). This reasoning led to the formulation of a smaller set of
fundamental principles which allow for the consideration of a broader range of co-operative practices. These three "contemporary" principles were adopted by the United States Department of Agriculture's Agricultural Co-operative Service (ACS) in 1987 and are as follows (ACS 1987: 14):

1) **The User-Owner Principle**: The people who own and finance the co-operative are those who use the co-operative.

2) **The User-Control Principle**: The people who control the co-operative are those who use the co-operative.

3) **The User-Benefits Principle**: The co-operative's sole purpose is to provide and distribute benefits to its users on the basis of their use.

This smaller set of principles were codified to emphasise the aspects which identify the distinctive characteristics of co-operatives versus other forms of business, namely the relationship of user interests to ownership and control interests. The uniqueness of the co-operative form of organization lies in the fact that "the user is the focal point, with the status of user, owner, and control vested in the same individual (ACS 1987: 13)." Privately owned and publicly traded firms (often referred to as investor-oriented firms or IOFs), on the other hand, use the amount of capital invested in the organization by an individual or company as the basis for determining voting power and allocating surplus. Also, IOF investors rarely depend upon the services provided by the firm (Fulton 1988).

A definition of co-operative organizations developed to reflect these principles is: "a co-operative is a user-owned and controlled business from which benefits are derived and distributed equitably on the basis of use (ACS 1987: 12)." This definition is workable from an economist's perspective because it is free from the normative concepts which often surround co-operative philosophy.
3.2 MARKET BENEFITS VERSUS MONETARY BENEFITS

Co-operatives are a prominent form of Canadian business organization, particularly in the agricultural sector. In 1992, approximately 40 percent of total farm cash receipts were handled by co-operatives, most significantly in the areas of grains and oilseeds, dairy, poultry and eggs, livestock, fruit and vegetables, and honey and maple products. Agricultural marketing co-operatives alone realized a business volume of $9.1 billion dollars, while supply co-operatives handled 36 percent of fertilizers and chemical sales, 27 percent of feed sales and 19 percent of seed sales (Co-operatives Secretariat 1994).

These figures imply that certain benefits can be derived from co-operative organizations which cannot be realized by other forms of business. Indeed, the economist would argue that it is only because the co-operative structure allows for certain economic benefits to be realized by members that they exist at all. As Dunn (1988: 85) pointed out, "members unite because they have mutual interests and remain united as long as it is mutually beneficial." This does not mean that all members receive equal benefits, it simply implies that the overall benefits from co-operation are perceived by the members as greater than those which could be achieved by the members acting alone.

For the purposes of this thesis, the economic benefits which accrue to producers from co-operation shall be distinguished as being either market benefits or monetary benefits. In general, market benefits arise through a co-operative’s ability to overcome market failures, which cannot be corrected on an individual producer level, and which often translate into expanded returns for co-operative members. Co-operatives can increase producer returns by realizing efficiency gains, influencing prices, or providing needed services. Co-operative members’ production costs can be reduced by realising economies of scale, otherwise unattainable on an individual level, through a co-operative. Further efficiencies can arise due to lower costs associated with the gathering and processing of information needed to carry out business transactions. Co-operative organizations can
also allow members to have a greater influence on prices by facilitating improved quality control or by limiting the variability in supply. In addition, by securing access to markets or by pooling prices, the variability in prices, and therefore member risk, may also be reduced through co-operative marketing. In some cases, co-operatives may also offer services, which would otherwise not be provided by the market, but which can open up additional income generating opportunities for co-operative members.¹

In non-competitive markets a co-operative’s ability to overcome long-term market failures, or market power, is particularly important. Because the existence of a co-operative offers a market alternative, producers may no longer rely solely on one or a few buyers (or sellers), and can therefore be in a position to avoid opportunistic pricing and price discrimination. This is frequently referred to as the competitive yardstick result, first developed from an economic perspective by Nourse in 1945 (Cotterill 1984). This result maintains that co-operatives have the ability to introduce competition in monopsonistic or oligopsonistic markets, which has obvious market benefits, in terms of lower prices, for both co-operative members and producers in general.

Producers also receive monetary benefits from co-operation as the cumulative earnings of the organization are eventually returned to them. If the co-operative is able to realize a net surplus from its operations, such surpluses are either redistributed amongst the membership in proportion to participation in income generating activities, or retained for the further development of the firm. Patronage refunds are commonly in the form of yearly cash payouts, while retained earnings frequently cannot be claimed until the member reaches age 65 or they permanently retire from farming (Agricultural Cooperative Service 1982). Monetary benefits from co-operation are therefore based on

¹ For more detailed discussions of the benefits of co-operation see Cotterill (1984), Staatz (1987), Sexton and Iskow (1988), and Schrader (1989a).
the returns generated by the business activities of a co-operative and are, for members, realized in the form of cash payouts.

3.3 IMPLICATIONS OF CO-OPERATIVE PRINCIPLES ON BEHAVIOUR

Both the market and monetary benefits described above can make an appealing case for co-operation, however, co-operative organizations are not without their problems. Many of the common problems faced by co-operative organizations stem from the difficulties involved in adhering to the three fundamental co-operative principles and from balancing the various, often conflicting, interests of co-operative players.

3.3.1 Ownership and Equity

User-ownership is one of the most important features of co-operation, but, unfortunately, it is also one of the most difficult to apply due to conflicts between individual member interests versus the well-being of the business. Co-operative ownership means that the business depends upon member investment for its capital base. However, a member's capital investment does not earn returns in of itself, as net earnings are distributed on the basis of patronage, not on the amount of equity invested, and many co-operatives pay limited, if any, dividends on equity capital.

These considerations have resulted in the classic problem of underfinancing in co-operatives, since the co-operative system offers farmers an individual incentive to patronise the co-operative but not to invest in it. There exist at least two reasons for this (Schrader 1989b). First, due to low or non-existent returns on capital, members, behaving as economically rational and individual profit maximizers, will invest only as much as is required for them to make use of the co-operative's services and partake in the benefits. This situation is further aggravated by "free-rider" problems, where,
because of the collective nature of co-operative organizations, the consequences of such behaviour will be carried by all, and not just those individuals who shirk on their investment responsibilities.

Secondly, because co-operative shares are not bought and sold in a public market (i.e., the stock exchange) they are not valued in terms of the expected present value of the firm's future net earnings. Therefore, because co-operative equity holders recover no more than the book value of allocated equity when redeemed, there exists less incentive for producers to invest in a co-operative. The illiquidity of capital stock and the tying of monetary benefits to current patronage, in combination with changing levels of co-operative use by members, can cause what are commonly referred to as horizon problems.² For example, members who intend to heavily patronize the co-operative over the short term may pressure their co-operative to increase current earnings at the expense of future earnings. The financing of long-term investments by a co-operative may therefore be particularly difficult if the bulk of its members believe that these investments will generate most of their returns after they have already retired (Staatz 1987).

To overcome some of these problems, most co-operatives have chosen to retain a certain portion of patronage refunds each year. This allows co-operatives to finance their equity in proportion to patronage to a greater extent, and in a sense, forces all active members to invest in the firm. However, provisions must be made by the co-operative to return this amount by some future date, and therefore retained equity can be seen as more of a debt than a form of equity (Caves and Peterson 1986; Corman and Fulton 1990). Other concerns with this method include determining how much of the earnings should be retained, as such investments mean that members must forgo some of their immediate monetary benefits.

² See Schrader (1989b), Staatz (1987b), and Shaffer (1987) for more information regarding the co-operative horizon problem.
A broad range of additional proposals have been put forward by different economists to try and alleviate co-operative capital constraints. At one end of the spectrum proposed solutions include increasing dividends on capital investments and the adoption of different equity redemption plans (Agricultural Cooperative Service 1982). While, at the other extreme, proposals have included alternative organizational structures to allow for the issuance of tradable stock and the complete restructuring of co-operatives into investor-owned firms (Schrader 1989b; Royer 1992).

The recent decision of SWP to sell shares to the public offers a clear example of some of the issues surrounding the problem of co-operative financing. On July 15, 1994 delegates from the Saskatchewan Wheat Pool voted in favour of a proposal to sell shares of the company. The proposal consists of issuing two types of shares. One class of shares will be designated as voting shares which can only be owned by farmers on a one-share per member basis, while the other class will be designated as equity shares to be publicly traded on the stock market, enabling the holder to benefit from the growth of the company. The management of the SWP cited the desire to raise additional capital in order to increase their investment in both primary and secondary operations as being one of the main reasons for the proposal. To quote Lyle Spencer, chief financial officer of the SWP: "the key to this proposal is preparing the company for future challenges and positioning the Pool to take advantage of opportunities. In addition to upgrading and modernizing the grain handling system, the Pool will continue to look at projects that will diversify the co-op and add value to farm products (Saskatchewan Wheat Pool 1994b: 10)."

3.3.2 Control and Equality

Members typically control co-operatives by voting on key issues, such as appointing delegates to the board of directors, on a one vote per member basis. The feature of democratic control is viewed as essential by some co-operative advocates as it theoretically prevents the domination by those who
contribute the bulk of the capital, and thus maintains equality (Staatz 1987). On the other hand such a system raises the possibility that a majority of members, who may contribute only a small part of the patronage of the organization, may impose policies that exploit the minority of large patrons. Recently, there has been much discussion regarding the broadening of the one-member one-vote principle in order to avoid disenfranchising those members who contribute relatively large amounts of capital to the co-operative. Proposals to overcome the problem include different voting rules (i.e., in proportion to patronage, equity investment, or a combination of both), however, the implementation of such systems have met with considerable debate (Zusman 1982; Royer 1992).

The debate regarding voting rules is again the result of some of the problems encountered by a co-operative due to the many different interests embodied by its membership (i.e., those who use the firm also control and own it). Because of the relationship between a co-operative and its membership, co-operatives can face three situations whereby decisions can: 1) impose varied impacts on different groups of members; 2) cause the co-operative to bear a larger share of the costs while members receive the benefits; 3) cause the co-operative to receive the benefits, at the short-term expense of its membership (Anderson 1987).

The first type of situation is directly related to the diversity, or heterogeneity, of the membership. One of the implications of a heterogeneous membership is that the potential for conflict will be large, as it will be difficult to establish a common group objective, and can result in members forming bargaining groups in order to establish their position (Zusman 1982; Fulton 1990). An example of this type of conflict is reflected by the difficulties faced by the members of the AWP and SWP to put forth a united policy stand on the issue of the Western Grains Transportation Act.

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3 The term short-run is used, because theoretically members will recapture some of the costs in the long run as any benefits realized by the co-operative will be redistributed to the membership.
The conflict lay in the fact that a significant number of the AWP's and SWP's members are cattle ranchers, who stood to gain from WGTA, whereas those members involved primarily in grain production saw the policy as detrimental (Fulton and Fairbairn 1990).

The remaining two situations are easily applied to the earlier discussion of retained patronage payments. If a co-operative were to reallocate all of its earnings through patronage refunds and buckle to the pressures of members (as users) with shorter patronage horizons, serious undercapitalization and the potential collapse of the co-operative could result. On the other hand, although a co-operative could benefit from retaining members' earnings, members (as owners) may perceive the costs as being too high, especially if clear equity redemption plans are not in place.

3.3.3 Benefits and Efficiency

Because members are the owners, users, controllers, and beneficiaries of a co-operative, co-operative firms face a myriad of objectives in their decision-making process, many of which often conflict. As presented by Staatz (1987), this feature implies that co-operatives face a "broader scope of optimization." At one end, co-operatives could choose to simply provide services at cost to members, possibly meeting the objective of members as individual profit maximizers and users. On the other hand, it may choose to maximize profits, possibly meeting the objectives of members behaving as owners and controllers. Each possible co-operative objective can have a significant impact on the efficiency of a co-operative's overall operations and its continued livelihood. Great care is needed to ensure that the pursuit of member benefits, particularly direct monetary payments, do not come at the expense of efficient and competitive business strategies. Again, problems also exist in defining a unified set of objectives which will please all members, particularly if they are highly heterogeneous (Zusman 1982).
The issue of elevator closures by the Prairie Pools serves to illustrate the dilemma co-operatives face when balancing user benefits with efficiency. As was mentioned in the previous chapter, the grain handling industry has faced a high degree of structural change in recent years. This has forced all elevator companies to close small inefficient grain elevators and invest in larger high throughput elevators. However, co-operatives were faced with additional constraints because their members naturally favoured numerous elevators in close proximity to their farms (Bohman and Vercammen 1993). Therefore, to allow for a compromise between the needs of the co-operatives as businesses and those of the members, the reconfiguration strategies of the Pools differed from those pursued by their IOF competitors. For example, closures have been somewhat slower; “elevator-substitutes” have been offered (such as mobile elevator services), and double-composite elevators (with an average of 5,600 tonnes capacity) have been built instead of the very high throughput elevators (greater than 10,000 tonnes capacity) preferred by the IOFs.

3.4 CO-OPERATIVE MODELLING

In the previous section some of the complexities involved in balancing the different interests embodied by co-operative organizations were presented. The balancing of these interests has also posed challenges for economists trying to form a consistent body of co-operative theory. In any economic model, the essential assumption is the choice of the decision rule. It is the myriad of possible co-operative objectives, and their impact upon economic decision making, particularly pricing and quantity decisions, that has played a fundamental role in the development of co-operative theory (Schmeising 1989).

Modelling agricultural co-operatives has developed from two alternative approaches. The first approach developed from the theory of the firm, while the second developed from the notion of a co-operative as a vertical extension of the member-producers (Sexton 1984). However, both approaches
arrive at the same set of equilibrium solutions, depending upon the choice of objective function. Four possible objectives are commonly presented in the literature (Cotterill 1987). They are:

1. Maximise co-operative net margins.
2. Maximise member’s welfare.
3. Minimise (maximise) price in a purchasing (marketing) co-operative.
4. Charge market prices and refund any surplus.

Each of these alternative objectives is discussed in the following section and analysed in the context of a supply or purchasing co-operative (although the analysis is easily extended to marketing co-operatives). A supply co-operative scenario is chosen because of this thesis’ focus on the Prairie Pools, which are considered here as suppliers of a service (grain handling) to producers who purchase it for a given price.

3.4.1 Co-operative as Monopolist

For simplicity, it is common in the literature to begin the analysis of the first three co-operative objectives presented above by assuming that a co-operative firm is the sole supplier of a service and has an open membership policy (Cotterill 1987; Fulton 1988). Figure 3.2 portrays the marginal cost (MC), average cost (AC), demand (D), and marginal revenue (MR) curves for a supply co-operative under these circumstances, with the general shape usually considered for a short-term time horizon.
Figure 3.2 Co-operative Price/Quantity Decisions

The profit maximising solution, objective (1), is achieved when a co-operative equates marginal revenue to marginal cost. This solution is presented in figure 3.2 where MR and MC intersect, and a quantity $Q_1$ is supplied for a price of $w_1$, resulting in profits equal to area $w_1bfg$. Although this objective is seen as rational for IOFs, few co-operatives would explicitly adopt such an objective as the gains from this type of monopolistic behaviour come at the expense of the producer (i.e. member) welfare (Cotterill 1987; Levay 1993). This can be illustrated in figure 3.2 by examining the triangular area under the demand curve and above the price line (i.e. $w_1ab$). This area roughly represents the profits (or consumer surplus) members receive from their farming operations, or alternatively, it can be viewed as the market benefits being realized by members through their co-operative. It is clear that if a
price lower than \( w_1 \) is charged by the co-operative, an increase in the returns and market benefits available to individual producer-members will result.

The second objective (2) is the maximization of member welfare. This is achieved when a co-operative chooses output at a level where the sum of the members profits from on-farm operations (consumer surplus) plus co-operative profit is maximized. The solution to this option occurs where the MC curve intersects the demand curve, represented in figure 3.2 when the co-operative supplies quantity \( Q_2 \) and charges price \( w_2 \). In meeting this objective the co-operative earns a profit, equal to area \( w_2ceg \), which is presumably returned to members in the form of a patronage refund. Alternatively, the co-operative can seek to offer farmers the service at the lowest possible price which just covers costs, objective (3). The solution for this objective is depicted where the AC curve intersects the demand curve, resulting in the quantity \( Q_3 \) being offered at a price \( w_3 \). The co-operative does not make any profits with this decision rule, and there are therefore no patronage refunds available to members.

Each of these three goals may be in the interest of different co-operative players. For example, optimizing net margins may naturally appeal to some managers who value profits as a measure of success. Active members, on the other hand, have every incentive to demand the lowest possible price for the service, in order to increase the returns to their own operations (Schmiesing 1989; Levay 1993). In terms of market and monetary benefits from co-operation, producers will achieve the highest level of market benefits when the third objective is chosen by their co-operative, because the corresponding market price is the lowest possible while still covering costs. Monetary benefits, in the form of co-operative profits (and hence patronage refunds and retained earnings), are the highest if the third objective is chosen. It has long been proposed, however, that it is the second objective which best serves the interests of a co-operative's owning-clients (Enke 1945). It is argued that, out of the three,
it is this objective which effectively balances a co-operative firm's requirement for business efficiency, or financial profits, with the economic welfare of its members. In other words, it is thought that this is the objective which achieves the optimal amount of market and monetary benefits needed to ensure the financial well-being of both the co-operative and its members.

In the long-run, however, it is argued that the third solution results in the only sustainable equilibrium. This is because it is reasonable to assume that producers will incorporate patronage refunds along with prices into their decision making process. Producers will therefore adjust their demand for the service provided by the co-operative to reflect the lower expected price (i.e. net of any per unit patronage refund). This will result in an increased demand for the service until all co-operative profits, and therefore patronage refunds, are eroded and the service is offered at cost (Schmiesing 1989).

3.4.2 Co-operative as Competitor

When the above analysis is expanded to include a number of firms, and the co-operative chooses to charge market prices, objective (4), several results occur depending on the level of competition in the market (Cotterill 1987; Levay 1993). If the market is perfectly competitive all firms become price takers, meaning a co-operative can only charge the market price and refund any temporary profits which may accrue back to its members. Again, any patronage refunds are temporary because, in the long-run, profits will signal other firms to enter the market. The entry, or threat of entry, by other firms will eventually cause the market price to be set where it just equals average cost and $AC=MC$. Therefore, all firms in the market will be just breaking even and no net surpluses will

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4 Some debate exists whether production at minimum average cost is assured. Entry may still reduce profits to zero, but the situation can exist where the firm will produce less than the efficient output level and will exhibit excess capacity. See Nicholson 1989: 577-580.
remain. The same solution results under conditions of monopolistic competition as, in the long-run, firms will be forced to produce at their break-even point due the entry of other firms into the market. Therefore, in the long-run then, under conditions of perfect and monopolistic competition, the same equilibrium condition holds, regardless of the objective function chosen by the co-operative firm.

In an oligopolistic market setting, however, the resulting equilibrium will depend upon which objective the co-operative firm(s) choose to maximise, and the degree to which non-cooperative firms will follow. In the short-run, the co-operative choices range between charging the market price (i.e., the joint profit maximising price for non-cooperative firms) and refunding any net surplus to members, or pricing at cost (i.e., not pricing as their profit-maximizing counterparts). If it is assumed that all firms have symmetric costs, then the long-run solution depends upon the membership policy of the co-operative.

If a co-operative has decided to restrict its membership the oligopolistic joint profit-maximising equilibrium of the IOFs will not be affected. This is because the co-operative has in a sense isolated a portion of the market by disallowing producers to switch suppliers. Therefore, the prices charged by the co-operative will only impact the welfare of its members, and will not affect the market price facing the remaining producers. If, on the other hand, a co-operative has an open-membership policy and co-operative patronage refunds exist (i.e. market prices are charged), these refunds will erode down to zero as non-members will eventually join the co-operative in order to take advantage of lower net prices (market prices minus any refund). The efficient co-operative will end up charging a price which equals long-run marginal cost and corresponds to the minimum of the long-run average cost curve.

The long-run solution for an open co-operative can result in two situations for IOF competitors. The first is trivial as the IOFs can choose to exit the market, leaving only the co-operative
as a monopolist. Alternatively, the IOFs can stay in the market but will be forced to follow the co-operatives behaviour as no one will purchase the same service from a higher priced firm. This second alternative is especially interesting from a policy perspective since it maintains that when a co-operative with a member-oriented objective function and an open membership policy moves into an oligopsonistic industry, other firms in the industry will be driven to price competitively. This result, the competitive yardstick result, has been referred to several times already and forms the basis for many of the market benefits associated with co-operation.

Unfortunately, the equilibrium solution that co-operatives with open-membership policies do not pay patronage refunds in oligopolistic markets is inconsistent with real markets. This inconsistency can be explained in part because of the assumption that all costs are included in the cost curves, including the opportunity cost of co-operative capital. In the real world, the rates of return on member capital contributions are, however, well below the opportunity cost rate. Therefore, it is argued that positive patronage refunds exist in equilibrium in order to fully cover the opportunity cost of the capital invested by co-operative members (Cotterill 1987).
CHAPTER 4: VERTICAL INTEGRATION BY THE PRAIRIE POOLS

The previous chapter provided an overview of co-operatives and their organizational objectives. Central to this discussion was the notion that farmers can realize certain market and monetary benefits from co-operative enterprise. These benefits are the result of a co-operative’s mandate to incorporate the objectives of its producer-members into its objective as a firm. The user-focus of co-operative firms has prompted an alternative definition of co-operatives as a form of vertical integration for producers. This chapter explores the concept of vertical integration in the context of co-operatives in greater detail. To begin, the concept of vertical integration is defined. This is followed by a discussion regarding the motives behind a co-operative’s decision to vertically integrate. A set of possible incentives is developed from standard theories of the firm and co-operative theory. These possible incentives are then used to analyse the vertical integration strategies of co-operatives in general, and the Prairie Pools in particular.

Vertical integration is defined as existing when a single enterprise participates in more than one successive stage of the production or distribution of goods or services. Internalising processes preceding the firm’s main activity is referred to as backward integration, whereas forward integration refers to stages succeeding primary functions. Total (or full) integration occurs when firms choose to perform all the steps involved in moving from a set of raw materials to the final distribution of a finished product (Carlton and Perloff 1990).

Figure 4.1 illustrates the links between the movement of products and general levels of activity in the grain production and distribution system (Schrader 1989). This figure clearly indicates the vertical marketing links which exist between many of the Prairie Pools recent expansion activities and their primary elevator operations. Another important link outlined in figure 4.1 is that between farm production and the elevator operations of the Pools. These types of links (i.e. between farm enterprises
and agricultural co-operatives' business operations) have prompted many economic theorists, beginning in the 1940s with works by Emelianoff and Robotka, to view co-operatives as being a form of vertical integration for primary producers (Sexton 1986). This view stems from agricultural co-operatives being businesses which operate between the operations of the farmer-members and the market, or markets, they must deal with, either upstream towards final consumer demand markets or downstream into input markets (Fulton 1988).

Figure 4.1 The Grain Production and Marketing System
4.1 STANDARD REASONS FOR VERTICAL INTEGRATION

In addition to the traditional treatment of co-operatives as special types of firms using standard theory-of-the-firm arguments, co-operatives have also been analysed simply as an expansion, or integration, of the farm enterprise (Sexton 1984). Both bodies of theory provide useful insights into the motivation behind the vertically integrated investment activities of the prairie grain co-operatives. In this section some of the standard theories developed to understand a conventional firm’s decision to vertically integrate will be reviewed and applied to the co-operative setting of the Prairie Pools. In section 4.2 an additional motive for co-operative integration, developed from the notion of co-operatives as extensions of farms, is presented.

4.1.1 Transactions Costs

One of the more economically intuitive theories used to explain vertical integration is the "Transactions Costs" paradigm developed by Williamson (1975). Standard microeconomic analysis suggests that in competitive markets, businesses will hire other firms to handle functions which deviate from their main activities. Therefore, when firms are observed to be bypassing the market and internalising secondary processes, one explanation is that the cost of transacting in the market is "high". Transaction cost theory further suggests that technological conditions (i.e. economies of scale) alone do not explain the integration behaviour of firms operating in a market economy.

Transactions costs can arise from negotiating contracts, incomplete contracts between firms, opportunistic behaviour by firms, and a variety of other reasons. The critical notion behind this approach is that certain situations may involve greater transactions costs than normal due to the degree of potential exploitation and the availability of information in the market. Four situations where transactions costs may be particularly high involve (1) specialised assets, (2) uncertainty that makes
monitoring difficult, (3) information, and/or (4) extensive co-ordination (Perry 1986; Carlton and Perloff 1990).

Asset specificity (1) implies that there is little or no use for the asset outside of the use for which it was created, or alternatively, it is a sunk cost for the asset holder. Therefore, the firm can become “locked into” a transaction with another firm, as the costs of turning to alternative, unspecialized assets is too large (Williamson 1987). This situation may motivate firms which own specialized assets to engage in an upstream or downstream activity themselves in order to seek assurance that the assets will be worked to their full capacity.

Uncertainty as to quality of the product a supplier provides (2) may also be a strong enough motivation to internalise a secondary production process. Because contracts are often difficult to structure in situations where a high degree of information asymmetry (3) exists, firms may undertake such activities themselves in order to ensure that adequate incentives exist to maintain maximum output and performance. As well, when extensive co-ordination in an industry is required (4) networking is often facilitated and costs are reduced through vertical integration.

Transactions costs are highly significant in the grain handling industry due to the bulkiness and perishability of the products involved, the specialized capital investments required, and the level of co-ordination and information needed to meet a highly export-oriented demand. The transactions costs theory therefore, seems highly plausible when applied to some of the Pools secondary investments. The Pools joint purchase of terminal elevator facilities on the Pacific Coast and Thunder Bay serves as one example. Cost savings may have been realised by securing terminal facilities as part of the Pools operations, due to the high degree of co-ordination required between country and terminal elevators. Another example is the purchase of processing facilities for non-CWB crops, such as flax and canola.
By investing in these processing activities transactions costs incurred by the Pools, due to the transportation and securing of markets, may have been reduced.

4.1.2 Market Failure and Market Power

The notion of transaction costs and sunk costs was extended by Klein, Crawford and Alchian (1978) to introduce quasi-rent capture and the threat of potential exploitation as a related motive for vertical integration. They noted that market failures can exist when firms are either in the position of being monopolised by others (due to specialised assets, uncertainty, or inadequate information) or there is the threat of potential exploitative behaviour. Vertically integration offers a way of solving such market failures, by avoiding reliance on a monopsonist or monopolist.

A good example of integration to avoid market failure is the Prairie Pools' decision to jointly establish a fertilizer manufacturing and distribution enterprise. Fertilizer pricing has always been a contentious issue on the prairies since the supply side has traditionally been dominated by only three or four firms which operate with considerable economies of scale. The Prairie Pools decision to move into fertilizer manufacturing and distribution can be viewed as a way of capturing at least some of the rents that would be lost by farmers via excessively high fertiliser prices and returning these rents to its members.5

The flip side of this argument is that vertical integration can also be viewed as a means of increasing rents available to a firm by creating market power within a marketing system. Most of the industrial organisation literature in this area focuses on the potential to earn monopoly profits, particularly if the firm is the sole supplier to a competitive industry (Carlton and Perloff 1990). In this situation the firm may, through forward integration, monopolise the final product market, and further

5 Some argument exists as to whether or not these results have actually occurred. See Fulton 1989.
increase profits by price discriminating. Although such strategies may not be directly applicable in a co-operative setting, given that co-operatives are often considered to have a pro-competitive impact on markets, related issues regarding the maintenance and growth of both market share and farmers negotiating strength relative to other agribusiness firms, have always been important strategic considerations for co-operatives (Levay 1993).

The Pools joint establishment of the single-desk selling of certain non-CWB crops in overseas markets (through XCAN) was probably motivated, at least in part, by the fact that higher prices could be negotiated for crops such as canola and flax if the Pools did not actively compete with each other in the various international markets. In general, however, the creation of market power does not appear to be an important factor in the Prairie Pools decision to integrate because the co-operatives’ share of the market in many of the down-stream and up-stream markets is quite small.

4.2 PROVISION OF NEEDED SERVICES

The theories developed to explain vertical integration by conventional firms apply well to the vertically linked investments of the Prairie Pools. However another reason, that of providing needed services to members, which does not apply to the conventional profit-maximizing firm, may also be motivating co-operative vertical integration. This section will briefly illustrate why a co-operative may chose to expand to provide additional services being demanded by its members, regardless of low or even negative profits.\(^6\)

Due to a co-operative’s focus on the welfare of its members, a co-operative enterprise may expand its operations in order to provide a needed service to its members or increase the opportunities available to its members. It is rational for an agricultural co-operative, as an extension of the farm

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\(^6\) This section is based on discussions by Sexton and Iskow (1988) and Howard and Klosler (1991) which focus on how producers may be motivated to form a marketing co-operative in order to gain access to market opportunities and services where no other alternatives exist.
enterprise, to expand into vertically linked markets as long as the benefits accruing to producers from expansion outweigh the costs incurred by the co-operative. Therefore, a co-operative may choose to expand into markets which are not profitable, but where the additional returns available to its members from their operations, offset the costs incurred by the co-operative in providing these returns.

Figure 4.2 is used to illustrate the notion of co-operative integration into non-profitable markets. Depicted in figure 4.2 are the general short-run cost and demand curves for a service which cannot be provided profitably, as the demand curve (D) for the service does not intersect the average cost (AC) curve. A profit oriented firm would not enter such a market as the costs from providing the service cannot be recovered. However, a co-operative acting on behalf of its members may choose to enter this market and cover the costs incurred by charging additional membership fees. For example, in figure 4.2 a co-operative may choose to supply quantity Q* (where the marginal cost of offering the service (MC) crosses the demand curve). In order to ensure that the entire supply is purchased, the co-operative should charge a corresponding price of P*. However, at the price P*, the co-operative is selling Q* for a price less than what is needed to cover the total costs of providing the service (i.e., to cover total costs a price of P' is needed). To cover its costs a co-operative may charge P* for the service and make up the difference (i.e., P'-P*) by charging additional membership fees. The members of a co-operative will benefit from such a situation as long as the overall returns that they receive from their own operations due to the provision of the service (i.e. the triangular area above the price line, P*, and below the demand curve) are greater than the costs covered through additional fees (i.e., (P'-P*)xQ*).
That the needs of the members are the driving force behind some of the investment decisions made by the Prairie Pools is illustrated by SWP’s continued commitment to Western Producer Publications despite consistently large losses up until the present year. It can be argued that the publishing of materials such as the Western Producer, a weekly newspaper geared almost entirely to the coverage of prairie farm news, are seen as having intrinsic value to co-operative members aside from those measured in the market place.

4.3 VERTICAL INTEGRATION BY CO-OPERATIVES

An agricultural supply or marketing co-operative forms a vertical link between the operations of farmers and the markets they must deal with. Co-operatives can therefore be seen as a vertical
extension of the farm, and as such, have been attributed with allowing farmers to bypass market structures considered exploitative or inefficient, and providing needed services otherwise unavailable.

The further integration by co-operatives along the marketing and production chain of agricultural producers can therefore simply be seen as an expansion of their original role in providing market benefits (as a result of increased competitiveness, cost efficiencies, and access to markets) for their members.

In general, the literature regarding co-operative growth would seem to support the view that the further integration of agricultural co-operatives can increase the market benefits available to producers. For example, Royer and Bhuyan (1994) develop a model for evaluating the market effects of co-operative integration under conditions of a bilateral monopoly. The study concludes that both producers and consumers are better off when co-operatives, rather than IOFs, integrate into assembly markets. This is because higher raw product prices are thought to be available for producers and lower market prices are said to exist for consumers.

Many studies have also acknowledge the existence of producer benefits from co-operative integration by focusing on why co-operatives have not vertically integrated to a larger extent. Such studies are commonly based on empirical findings which suggests that co-operatives have not expanded their operations to include integrated investments to the same degree as their investor owned competitors. For example, a study by Rogers and Marion (1990), in their examination of the United States food and tobacco manufacturing industry, suggest that co-operatives investment decisions are driven to protect and secure competitive markets for their members. They concluded that co-operatives do not play a dominant role in markets beyond first-stage marketing and food processing activities as they are often insufficiently capitalised to make
the substantial investments (for example, in research and development and in advertising) necessary to be successful in activities closer to consumer markets.

Whether or not the Pools have invested in vertically linked activities to the same degree as their IOF counterparts is beyond the scope of this study. However, it is clear that three Prairie Pools have invested heavily in activities directly along the marketing and production chain of the producers they represent. The vertical nature of these investments would support the notion that the Pools have, in part, been motivated to expand in order to realize increased market benefits on behalf of their members. Increasingly, however, the prairie grain co-operatives, in particular SWP, have begun to invest in areas where such links are no longer clear. It is the motivation for these types of investments that will be discussed in the following chapter.
CHAPTER 5: DIVERSIFICATION OF THE PRAIRIE POOLS

The theories reviewed in the previous chapter do much to explain the motivation behind the Prairie Pools' decisions to invest in activities further along the marketing chain, as such investments can be viewed as a means by which market benefits accruing to producer-members can be increased. However, many of the Prairie Pools investments cannot be classified as activities which have clear links with the production of their members. Such diversified investments are distinct from vertical investments because, as they fall outside of the producers marketing and production chain, they are motivated by a different set of factors than those of increased market benefits.

An examination of the possible motives for diversification by co-operatives is the focus of this chapter. To begin, some of the difficulties involved in distinguishing the Pools' diversified investments from their vertically integrated investments are highlighted, and the different types of investment methods used to diversify Pool operations are discussed. This is followed by a presentation of the conventional reasons for firm diversification and an application of these reasons to co-operative expansion, and in particular, the expansion of SWP. An alternative hypothesis is then presented to further explain co-operative diversification, and a mathematical simulation model is developed to examine and illustrate this hypothesis in detail.

The two terms, vertical integration and diversification, are closely linked and frequently used interchangeably. However, the distinction between the terms is important, as the motives for each type of expansion are quite different, as are the resulting impacts upon firm performance. For this analysis, the distinction will be made in terms of direct (integration) and indirect (diversification) relations to primary activities. Integration therefore refers to a situation where there are no direct breaks in the ownership or physical control of the commodity within the marketing chain, whereas diversification
refers to a situation where such breaks exist. Such a definition is consistent with the previous discussion in Chapter 4, since the benefits associated with vertical integration can only be realised if ownership or physical control of the primary product is maintained.

Even with the above definition, however, the distinction between the primary operations, vertically integrated investments, and diversified investments of the Prairie Pools is not always clear. Primary activities obviously refer to the primary grain handling services of storing, weighing, elevation, and outward loading of different grains and other Prairie crops. However, investments in vertically linked activities classified as divisions by the Pools (i.e. farm supplies, livestock, terminal, and publication divisions) can also be considered primary operations, as they are reported as such in the companies' annual reports.

Clear examples of vertically integrated investments include investments in oat processing (MPE) and bean and mustard processing (AWP). On the other hand, investments in processing activities involving wheat and barley could be considered diversified investments, because the ownership of wheat and barley moving through pool elevators is transferred to the Canadian Wheat Board before becoming inputs for the affiliated processors. Therefore, one could contend that the marketing margins which may have been available for transfer to producers through the co-operative, may not exist because of government regulation (Vercammen 1993). SWP's investment in the marketing and development of health and beauty products is a clearer example of diversification. Those investments, which, although indirectly linked to other investments, are no longer linked to members' production, are also classified as diversified expansion (i.e., the SWP's investments in the production of pie fillings and icings (Dawn Foods) to complement an investments in donut production (Robin's Donuts)).


5.1 TYPES OF EXPANSION

The Prairie Pools diversified investments are also unique in the sense that they are achieved in ways which are frequently not associated with co-operative business strategies. As was mentioned in section 2.3, firms can choose to expand their operations using different forms of external growth or through the formation of organisational alliances (Vilstrup, Cobia, and Cropp 1989). Some of these methods of expansion can be viewed as more traditionally co-operative in nature than others, according to their impact on co-operative structures and members.

5.1.1 External Expansion

Mergers, consolidation, and acquisitions are three ways in which a firm can expand its operations externally. These methods of investment can offer co-operatives the opportunity to expand quickly, and perhaps cheaper and with less risk, than other alternatives. However, there sometimes exist disadvantages to external growth which are of particular concern to co-operatives. For example, inter-cooperative relationships may become more complicated when two or more co-operatives decide to merge or consolidate their holdings. Important implications regarding the co-operative’s community identity can also arise. Such problems can rarely be solved without sacrificing some member interests (Vilstrup, Cobia, and Cropp 1989).

Although none of the recent growth patterns of the three pools have involved the merger or consolidation of two or more co-operatives, there have been several discussions regarding the possible merger of the three Prairie Pools in the past. However, these discussions were never acted upon as the Pools’ management recognised the difficulties involved in reaching a consensus when producers from all three provincial areas were concerned. This is particularly the case between the AWP and SWP, as

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7 For a more complete discussion of the advantages and disadvantages of external growth and organizational alliances please see Vilstrup, Cobia and Cropp (1989).
members from Alberta are more cattle orientated than the primarily grain oriented producers from Saskatchewan, resulting in conflicting objectives, for example, in setting of prices for feed grain.

Some of the problems associated with the merger or consolidation of firms can be avoided through the direct acquisition of other firms, either co-operative or IOF. New services can be quickly added to existing services provided by the co-operative and market shares can be increased. However, as with an IOF, co-operative management must have the skills necessary to evaluate and price such opportunities. In addition, such purchases can require substantial cash financing not always easily available for co-operatives (Vilstrop, Cobia, and Cropp 1989).

Acquisitions were commonly used by the Pools in earlier years as they expanded their primary operations. For example, in 1972 the three prairie Pools purchased the Federal Grain Company, and divided the purchased assets among themselves. This resulted in a significant increase in AWP’s market share with the addition of 422 elevators, and a 60 per cent share of the Pacific Elevators Ltd. terminal elevator, which AWP now manages (Alberta Wheat Pool 1992).

5.1.2 Organizational Alliances

Different types of co-operative organizational alliances include the creation of federations, holding companies, and joint-ventures. The formation of another co-operative or federation (with co-operatives as owner-patrons), and joint-ventures with other co-operatives are convenient devices which allow co-operatives to achieve and capitalise on efficiency gains and market access. In addition, the co-operative component in these two expansion strategies makes them more palatable to many co-operative activists. Indeed co-operation among co-operatives is viewed by some as a key co-operative principle and is promoted by the International Co-operative Alliance.

As was presented in section 2.3, the Prairie Pools have actively pursued co-operative alliances. Examples of joint-ventures formed among themselves include: XCAN Grain, an international grain
sales company (which has a subsidiary that charters vessels for grain movement) owned by all three pools; and CanAmera Foods (formerly CSP Foods), Canada's largest oilseed crushing company, owned jointly by MPE and SWP. The pools have also formed a number of joint-ventures with other co-operatives, such as COENERCO which was started by a group of Canadian co-operatives and a provincial government to increase Canadian ownership and control of the energy supply (Mcgillivray and Ish 1992).

Forms of alliances which have more critical implications for co-operatives and their members are co-operative/IOF joint ventures and holding companies. IOF joint ventures are often used as a means by which co-operatives can gain access to markets controlled by the IOF. Holding companies are owned and controlled by means of a voting trust, and have their own set of subsidiary corporations and investments (Vilstrup, Cobia, and Cropp 1989). It is these types of alliances which are more commonly used to diversify into areas where the relations to primary operations are not clear. As with any large diversified IOF, it is often very difficult for interested parties to track and analyse the holdings of co-operatives with these types of alliances, particularly when holding companies are concerned. For this reason, it may be difficult for large co-operatives investing in such a manner to ensure that the best interests of their members are being met.

In section 2.3 it was shown that the SWP has used IOF joint-ventures and holding companies to diversify its operations to a far greater extent than the AWP and MPE. SWP's corporate structure is highly complex, with many investments acquired indirectly through the holdings of affiliated companies, making it difficult not only to track investments but also to assess their impact upon Pool members. It is the example of the SWP that is primarily used in the following sections to examine the possible economic motives for co-operative diversification.
5.2 CONVENTIONAL NOTIONS AS TO WHY FIRMS DIVERSIFY

Two main areas of argument have been put forward in the industrial organisation literature to explain conventional firm diversification strategies (Shepard 1985). One area focuses on the possible efficiencies that can be gained through diversification, while the other focuses on the advantages of risk pooling and cross-subsidisation.

5.2.1 Efficiency

It has been argued in the industrial organisation literature that an experienced firm may transfer a proven technology into diversified markets more efficiently than outside market forces, because it may be more aware of the opportunities that exist (Teece 1982). The reason for this is that there may exist unused resources, such as production capacity and managerial skills, which cannot be sold or rented for their true value on the open market as they are tied to specific technologies or assets. Teece (1982) echoes Williamson (1975) by suggesting that when a firm faces a tight or non-existent market for such resources, it can save substantial transactions costs by substituting diversification for market exchange.

To illustrate some of the arguments for increased efficiency, Teece (1982) uses the example of the management of a firm having access to information regarding diversified investment opportunities which is unavailable to their shareholders. In such a case, efficiencies can be gained if the information is used by management, and the opportunity is acted upon, by investing on behalf of their stockholders. Diversification in this manner would have the end result of increasing shareholder returns and improving resource allocation. Of course this implicitly assumes that managers have correct internal

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8 A third, put forward by Shepard (1985), deals specifically with take over attempts of publicly traded corporations. This does not apply to traditional co-operative firms as they are member owned organizations whose shares are not traded.
information which cannot be capitalised upon in normal markets, and therefore firms are better off withholding dividends and making the investment decisions directly.

It is unclear as to the extent to which efficiency gains may be motivating the Prairie Pools recent diversification strategies. The arguments for multi-product diversification to maximise production technologies does not seem particularly relevant to the case of the Prairie Pools, given that they are primarily marketing and service organizations, as opposed to manufacturing. The notion that efficiencies can perhaps be gained as a result of increased recognition of opportunities by the management of a firm deserves further consideration, as it has often been noted that co-operatives may have an advantage over IOFs in identifying business opportunities, due to their community and producer orientation. However, it has also been noted that such advantages erode with the size of the co-operative, particularly when they represent a large number of diverse communities and members (Fulton and Hammond Ketilson 1990). The three Prairie Pools are such co-operatives, therefore it is unclear if Pool managers would have an advantage in identifying community-based business opportunities.

Two important issues are raised if efficiency gains, of the type presented by Teece (1982), proved to be a major motivation behind the Pools diversified investments. First, whereas the shareholders of investor-owned firms are informed via the stockmarket if poor investment decisions have been made by management, co-operative members are not. Perhaps more importantly, even if co-operative members felt poor strategies were being pursued by management, they are offered little recourse should they decide to go through the often difficult process of suspending their membership (Fulton 1990). Secondly, given the heterogeneity of the Pools membership, and the different opportunity costs individual members face in making investment decisions, it is questionable if management could act in all of the members’ best interest by investing on their behalf.
5.2.2 Risk Pooling and Cross Subsidisation

Two additional reasons commonly offered to explain the diversification of firms are risk pooling and the cross subsidisation of earnings. Risk pooling refers to the ability of diversified firms to stabilise fluctuations in total earnings across several different investments. For such a strategy to function properly, investments should follow offsetting cycles. Similarly, cross subsidisation occurs when the earnings from investments in secondary activities are used to cover the losses in primary operating divisions.

Although it is well established that co-operatives, as an extension of the farm, can play a critical role in stabilising the earnings of their members (i.e. through supply and quality control) at the primary level, it is not clear if risk pooling on behalf of members can be effectively extended through the further diversification of co-operatives (Sexton 1986). However, in an indirect sense, co-operatives are commonly motivated to reduce their members risk by supporting activities which aid in stabilising the earnings to agricultural producers. For example, the three Prairie Pools have, since their formation, been heavily involved in influencing government policy decisions (for example, the maintenance of single-desk selling and the Canadian Wheat Board) in an effort to reduce the risk-level of grain producers (Fulton and Laycock 1990). Their expansion to include diversified activities such as organised national lobbying (i.e., through Prairie Pools Inc.), publishing and other information services, and insurance programs, all serve to supplement this role to a certain extent.

Pressure on the Pools to invest in high throughput facilities as a result of the structural changes in the industry, are often cited as part of the reason for the Pools diversification strategies. These arguments would seem to support the notion that the primary elevator system is perhaps being cross-subsidized by the earnings from diversified investments. However, figure 5.1 graphs of the earnings from selected operations and net earnings for SWP over recent years, and indicates that while the
earnings from associated companies have been increasing in importance in recent years, they do not appear to have contributed to the stability of net earnings. The frequent fluctuations in the earnings from the diversified holdings of SWP would seem to suggest that these earnings cannot be relied upon to cover losses in primary operations (Vercammen 1993). The earnings from SWP's vertically linked terminal operations seem to provide a more consistent flow of income than the returns from their diversified holdings.

![Selected Earnings of the Saskatchewan Wheat Pool](image)

Source: SWP Annual Reports.

Figure 5.1 Selected Earnings of the Saskatchewan Wheat Pool

### 5.3 A PARTICULAR HYPOTHESIS AS TO WHY THE POOLS DIVERSIFY

It is not clear how well the conventional theories of the firm regarding diversification apply to the prairie grain co-operatives. This is partially due to the fact that these theories are based on a certain preoccupation with profits (either through seeking additional profits, or trying to maintain or stabilize them). Theoretically co-operatives do not fit well in a profit oriented
framework because of their broader mandate to meet the needs of their members. Because of this mandate, co-operatives are said to face a wider set of objectives which includes market benefits to members, as opposed to solely monetary benefits, or profits for the firm.

In this section an additional motive for co-operative diversification is hypothesised to exist; one which builds upon the notion that perhaps co-operatives are becoming increasingly preoccupied with monetary returns, and hence profit levels. This hypothesis is first explained in this section, and in the following section a simulation model is developed to illustrate the possible implications of this hypothesis, and co-operative diversification, upon producer welfare.

It was noted earlier that the benefits from co-operation can be distinguished in at least two ways; those in the form of direct monetary returns on co-operative capital and those which occur indirectly, through increased market competition or market access. This thesis puts forth the hypothesis that the Pools could be facing increased pressure to realise a higher level of monetary benefits, which are visible as a firm’s “bottom-line”. In other words, perhaps it is the case that various co-operative players are placing more value on the monetary benefits, than on the market benefits, realised through their co-operatives. These pressures could be coming from either the members themselves, co-operative management, other institutions, or a combination of all three, for a number of reasons.

**Member Demands**

For members, the market benefits from co-operation can result in increased operating margins, while monetary benefits are realised through returns on members' equity and are calculated on the basis of patronage. Pool members may be demanding an increased return on their equity for two reasons. First, members may be placing less value on the pro-competitive benefits that the co-operative structure initially provided at the farm level, as they may be unaware of
the continued existence of such benefits. As Levay (1993: 29) writes: “Once the co-operative is in being and is operating as a pacemaker in the market, members of co-operatives, seeing that they are achieving no difference in the current prices offered by competitors and those of their own association, ... may become disenchanted with the co-operative and withdraw their support. ... (resulting in) the constant looking around for short-term gains which may prejudice the long-term security of the organisation.” Therefore, members may be searching for increased rates of return, as a means to increase their monetary returns, because they are no longer aware of the positive impacts that the Pools may have on the markets in which they operate.

Secondly, similar demands could be a result of the horizon problem discussed in chapter 3. If a large group of members are facing shorter patronage horizons, they may be pressuring the Pools to invest in activities which produce higher returns while they still patronise the co-operative and can therefore share in such gains. That the increase in current earnings needed to support such pressures may come at the expense of the continued viability of the co-operative may not concern older members with retirement in mind.

Overall, if such demands exist, it would imply that the co-operative is being viewed more in terms of an portfolio investment, with a focus on relative profit measures such as rates of return, rather than a vertical extension of member’s production activities (Peterson 1992). Furthermore, if the members are successful in having these demands met, one might also expect that such pressures may result in corresponding increases in the level of cash payouts to members. Figure 5.2 graphs the net revenues and cash payouts made to members (lagged one year in order to correspond with the year in which the returns were realised) by the Saskatchewan Wheat Pool from 1975 to 1993. This graph would seem to indicate that if members are pressuring their co-operatives to increase their rates of return, it has not resulted in any significant trends towards increased cash payouts in
proportion to net earnings. However, the recent decision by the SWP to issue publicly traded shares could be the result of such pressures, as this move will allow members to earn capital gains on their investments in the Pool and divest or invest in accordance with their patronage horizons.

![Saskatchewan Wheat Pool](image)

Source: SWP Annual Reports.

Figure 5.2 Earnings and Patronage Refunds of the Saskatchewan Wheat Pool

**Management Incentives**

In chapter 3 some of the unique problems co-operative organizations face in balancing the objectives of the co-operative as a firm with the different, and often conflicting objectives, of its members were discussed. Up until this point, however, little mention was made with regards to a similar problem that almost all organizations face, regardless of their ownership structure. This problem is commonly referred to as the “agency problem” in economic literature, and is the result of the difficulties involved in aligning the objectives of an organization’s decision makers with the objectives of its owners. A specific extension of this problem are the difficulties involved in inducing
the management of firm to make choices which will maximize the welfare of a firm's owners rather than their own welfare (Jensen and Meckling 1976; Fama 1980).

It has often been noted that a co-operative's agency problems may be quite significant because of the difficulties managers sometimes have in recognising that the traditional goals for IOFs, such as profits and growth, are often not as appropriate for co-operative organisations (Sexton and Iskow 1988; Fulton 1990; Cook 1994). The failure to recognize that conflicting interests may exist between the management and members of a co-operative may result in the adoption business strategies, such as diversified expansion, which increase co-operative rates of return rather than meeting the needs of the membership. In other words, co-operative managers may mistakenly perceive the success of their co-operative, and their own success, as being tied to the financial performance of the firm, rather than being tied to meeting the needs of their co-operative’s members. In addition, if a co-operative is not meeting the needs of its members, it is likely that those members will begin to demand rates of return on their equity comparable to those earned in other ventures.

Larger co-operatives, with a highly heterogeneous membership and a large professional bureaucracy, are considered much more likely to emphasize rates of return as a measure of their business and management success (Rhodes 1987). All three of the Prairie Pools employ a large professional management staff, however, SWP’s is the largest and most established of the three.

Other Institutions

Pressures to increase reported rates of return may also be coming from interests outside of the co-operative itself. Other institutions, such as creditors, may not recognise, or even value, the indirect benefits which occur due to co-operative participation in agricultural markets. This could result in co-operatives being judged by the same criteria as profit maximizing IOFs, a situation that is particularly important for a co-operative which is actively seeking to increase its capital base. In light of SWP’s
recent decision to issue public shares, it is highly likely that significant amounts of energy will be spent on convincing outside investors that the co-operative is a solid investment, offering attractive rates of return.

In summary, the particular hypothesis presented in this section rests on the notion that increased value is being placed on the realization of higher co-operative rates of return, causing the Prairie Pools, particularly SWP, to invest in a greater number of high-value diversified activities, thereby boosting the rates of return on total co-operative investments. Such pressure could be coming from several different interests, but is essentially caused by an undervaluation, or lack of recognition, of the non-monetary benefits stemming from the Prairie Pools presence in the primary markets within which they operate.

Little empirical evidence can be offered to prove the validity of this hypothesis, and it is beyond the scope of this paper to do so. However, as was mentioned earlier, the contribution of returns on investments in activities outside of primary grain handling, relative to the returns on total Pool investments, has increased. Furthermore, some of the published statements made by Pools' management would seem to indicate an increased concern with reporting higher rates of return. For example, in the introductory remarks of SWP's 1994 annual report, return on investment is listed first as an area being given particular emphasis, followed by customer service and the wise deployment of human and financial resources. In addition, all three Pools have recently begun to publish rates of return on invested capital, returns on equity, and other profitability measures in their annual reports.

5.4 MATHEMATICAL MODEL OF RATE OF RETURN HYPOTHESIS

In this section a simulation model is developed in order to illustrate, how, in an effort to increase their reported rates of return, the Prairie Pools may be motivated to diversify their operations to a greater degree than may be in the best interest of their producer-members. An
oligopoly scenario is chosen, as it is not only interesting from a theoretical perspective, but it also parallels the grain handling industry, as there are typically only two or three companies which operate in a particular geographical region.

Three firms are assumed to be competing in a market (for example, the market for grain handling and associated services), two investor-oriented firms and one co-operative. All firms have the same cost for a given stock of capital, and the service considered is perfectly homogeneous. The model reflects a single period outcome. To provide a brief overview of the model, this outcome can be decomposed into two stages of decision making. In stage one, the co-operative chooses how much capital to allocate between its primary operations and diversified enterprises (the capital base of the IOFs is assumed to be fixed throughout this game). In stage two the IOF chooses how much output to supply. The stage two supply decision of the co-operative is trivial, as it is assumed that the co-operative always chooses to operate at full capacity. The model is solved by substituting the stage two decision rule of the IOF into the co-operative’s stage one objective function and then choosing the allocation of capital which maximizes member surplus subject to a rate of return constraint.

Aggregate demand for the service offered by the firms, \( Q_D \), is a function of the industry price, \( w \), and can be expressed as

\[
Q_D = \frac{a}{b} - \frac{1}{b} w.
\]

The inverse demand can therefore be written as

\[
w(Q_D) = a - bQ_D
\]

and in equilibrium

\( Q_D = X_P + X_C \)

where \( X_C \) is the output of the co-operative, and \( X_P \) is the total output of both private (IOF) firms.

In this model the co-operative is always assumed to be operating at full capacity. This assumption is based on a co-operative’s mandate to return any profits realized back to its customers on
the basis of patronage. The existence of patronage refunds implies that, although there is only one industry price, a lower net co-operative price (the market price minus per unit patronage refunds) will cause the rational producer to purchase the service from the co-operative first, before turning to the IOF as a second best option. Therefore, there will always be an excess demand, or queuing, for the co-operative’s output. The co-operative will not raise its selling price in order to reduce this excess demand, because, when operating at capacity, the losses realized by the co-operative customers from paying a higher price will exactly equal the benefits those customers receive in the form of higher patronage refunds (as a result of the additional profits earned by the co-operative). For this same reason it would not be in the co-operative members’ best interest if the co-operative were to restrict its supply below capacity, as such a decision would also never serve to increase member welfare. Hence, when facing a capacity constraint, the co-operative charges the same price as the private firms.

The co-operative is presumed to have a fixed amount of capital ($K$) which it chooses to allocate between investments in primary (i.e. the distribution, handling, and marketing of grain and other Prairie crops) operations ($K_g$), and diversified investments ($K-K_g$). Suppose that $K_g$ units of capital result in $\alpha K_g$ units of capacity and hence, $\alpha K_g$ units of output for the co-operative (i.e., $\alpha K_g = X_C$). Also suppose that all firms have a constant marginal cost of production, $MC_i$, and a fixed cost of production, $FC_i$.

The co-operative chooses to allocate its capital stock in a manner which maximises a portion of overall producer welfare plus its own profits. In this case, the portion of producers the co-operative chooses to incorporate into its objective function is determined by the co-operative’s market share. A corresponding portion of total industry demand can therefore be viewed as the co-operative “members” demand, which corresponds to the portion of those producers whose welfare the co-
operative chooses to maximise. Let $D_C$, denote such a demand curve. $D_C$, in this case, has a slope, $b_c$, which is proportional, according to the inverse of market share, to the slope of aggregate demand, $b$.

That is,

$$b_c = \frac{(X_c + X_P)}{X_c} \cdot b.$$  

Hence, the formula for the portion of overall producer welfare (or total consumer surplus) which the co-operative chooses to maximize in addition to its own profits is given by $0.5b_c(aK_g)^2$.

If the co-operative receives a rate of return, $r$, on capital invested in diversified enterprises, then an expression for the function that the co-operative chooses to maximize (i.e., member welfare), $MW$, can be written as

$$MW = \alpha \cdot K_g \cdot (w - MC_c) - FC_c + (K - K_g) \cdot r + 0.5 \cdot b_c \cdot (\alpha \cdot K_g)^2.$$  

Where $w$ is the industry price: $w(Q_D) = a-b(X_P+X_C) = a-b(X_P+\alpha K_g)$.

Equation (2), or member welfare, is therefore composed of the returns the co-operative earns on primary operations, the returns realized on diversified investments, plus a portion of overall producer welfare (chosen arbitrarily to correspond to the number of producers who actually service the co-operative). Furthermore, equation (2) specifies member welfare as a function of the stock of capital allocated by the co-operative to primary services and the aggregate output of the IOFs.

However, before the co-operative chooses the optimal stock of capital to allocate to primary operations, it is necessary to determine how the IOF will respond to changes in the level of capacity of the co-operative. At the point in time when the private firms choose their level of output, the co-operative has already made all decisions regarding capital, that is, co-operative capacity (output) is fixed at level $\overline{X_c}$. Also, the IOFs’ capital base is assumed to be fixed and identical throughout the model, therefore their capacity decisions have already been made, and their capacity choice is thus
constrained. The objective function for the private firms is to choose an output level which will
maximise profits, subject to the degree to which they are either able to collude with one another or
produce at capacity. The two extremes are:

i) a cartel solution where the joint profits of both private firms, $\Pi_p$, expressed as

\begin{equation}
\Pi_p = X_p \cdot \left[ a - b \cdot (X_c + X_p) \right] - MC_p \cdot X_p - FC_p ,
\end{equation}

are maximised, such that optimal joint output is

\begin{equation}
X_p^* = \frac{a - b \cdot X_c - MC_p}{2b} ;
\end{equation}

and ii) a solution where both private firms operate at capacity, $X_p^{**} = 2 \cdot C_p$, where $C_p$ equals
the capacity constraint for one of the private firms. In general, the combined output from the private
firms will lie between these two extremes and can be expressed as a linear combination of $X_p^*$ and
$X_p^{**}$. That is $X_p = \lambda X_p^* + (1 - \lambda)X_p^{**}$. Substituting from above gives

\begin{equation}
X_p = \lambda \left( \frac{a - MC_p - b \cdot X_c}{2b} \right) + (1 - \lambda)(2C_p) .
\end{equation}

The parameter $\lambda$ can be thought of as a “collusion” parameter for the private firms; when $\lambda = 1$ the two
firms form a cartel and when $\lambda = 0$ both private firms produce at full capacity.

Using $X_c = \alpha K_s$, $w = a - bQ_D$, and $Q_D = X_c + X_p$ specified above, the expression for the industry
price, $w$, can now be written as

\begin{equation}
w = a - b \left[ K_s + (1 - \lambda)2C_p + \lambda \left( \frac{a - MC_p - b\alpha K_s}{2b} \right) \right].
\end{equation}

If this expression is substituted into the member welfare function specified in equation (2) then member
welfare can be written as

\begin{equation}
MW = \alpha K_s \left[ a - b \left[ X_c + (1 - \lambda)2C_p + \lambda \left( \frac{a - MC_p - b\alpha K_s}{2b} \right) \right] - MC_c \right] - FC + (K - K_s)r + 0.5b_c(\alpha X_c)^2 .
\end{equation}
Note that $K_g$ (i.e. the amount of capital allocated by the co-operative to primary operations) is the only choice variable in this welfare function. The co-operative’s choice of $K_g$ specifies the level of private firm output ($X_p$) from above, and this output combined with the co-operatives output, $\alpha K_g$, determines industry price. Hence, the problem facing the co-operative is to choose $K_g$ to maximise member welfare. The first order condition for this problem can be written as

$$\frac{\partial MW}{\partial K_g} = \alpha \left[ a \left( 1 - \frac{\lambda}{2} \right) + b \left[ 2 C_p (1 - \lambda) + Kg(\alpha \lambda - 2) \right] + \frac{\lambda MC_p}{2} - MC_c + \alpha b_c K_g \right] - r = 0$$

Equation (7) states that co-operative capital should be allocated such that the marginal increase in co-operative profits plus the marginal increase in member welfare via a lower cost of grain handling and associated services must equal the marginal return from diversified investments.

The solution to equation (7) is the optimal value of $K_g$. The optimal value of $K_g$ can then be substituted into equations (3), (4), (5), and (6) to arrive at equilibrium values for $\Pi, X_p, w$ and member welfare ($MW$). As well, member welfare can be decomposed into the portion which can be classified as a monetary benefits from diversified investments, $(K-K_g)r$, and the portion of market returns which emerge from the primary market (i.e. the lower $w$ is, the higher producer welfare is). It is the failure to recognise the “true” value of the latter portion of member welfare which gives rise to the additional motive for co-operatives to diversify hypothesized in this thesis.
CHAPTER 6: SIMULATION RESULTS FOR RATE OF RETURN MODEL

In the following chapter the possible implications of the hypothesis proposed in section 5.3 are examined by presenting simulation results from the model developed in section 5.4. The results from two different scenarios are presented, each based on different cost assumptions. Both scenarios are analysed by comparing a situation in which the co-operative maximizes member welfare to a situation where a bias towards diversification, as a result of an increased focus upon co-operative rates of return, is proposed to exist.

6.1 BASE CASE SCENARIO

As a base case scenario the model is calibrated such that both the private firms and the co-operative face the same cost structure, and both marginal costs and fixed costs do not depend on the level of firm capital. The second part of this assumption is unrealistic, however, it serves to greatly simplify the graphs which illustrate the results, and it is later dropped in the second scenario. Figure 6.1 provides a graphical illustration of the base case scenario once the optimal level of capacity is chosen by the co-operative, $X_c$. The two private firms must subsequently choose output according to the degree of collusion, or competition, between them. In the case illustrated, $\lambda$ is equal to 0.4, indicating a moderate level of collusion between the two private firms. $X_1$ is the output for one of the private firms, $X_F$ is total private output, and $X_T$ is total industry output. Given the total level of output, or service, provided in the market, the industry price (in this case $w_{0.4}$) is determined from the aggregate demand curve for the service (i.e., primary grain handling and associated services) presented by $D_{agg}$.

Figure 6.1 also shows the range of possible prices if $\lambda$ is allowed to vary but the co-operative's capacity remains fixed. For example, if the private firms were able to maximize their joint profits (i.e. form a perfect cartel), $\lambda = 1$, they would choose output where the marginal revenue of the private firms,
MR_p, equals the marginal cost of all firms MC. This would result in a price of w_1, which is determined by D_p, the residual demand curve facing the private firms (i.e. aggregate demand less the output of the co-operative). On the other end of the spectrum, w_0 corresponds to the situation where λ = 0, and both firms are simply producing at capacity (X_p = 2C_p). In this case price is determined where the residual demand facing private firms crosses the private capacity constraint (i.e., the sum of both firms capacity; 2C_p).

Figure 6.1 Base Case Scenario

The case where λ = 0.4 and an optimal level of capacity is chosen by the co-operative is again presented in figure 6.2. This graph illustrates co-operative profits and the portion of producer welfare which the co-operative has, based on its market share, included in its objective function (i.e. member surplus). The small cross hatched rectangle which lies above the average total cost curve of the co-
operative, ATC, and below member surplus, indicates the amount of return, or profit, accruing to the co-operative over and above the amount needed to cover any costs incurred from the provision of the primary services. Co-operative member surplus is a portion of total producer welfare and is indicated as the large cross hatched triangle above the price of the service, $w_{0.4}$, and between the aggregate demand curve, $D_{agg}$, and the demand curve, $D_c$. $D_c$ represents the demand for that portion of producers who’s welfare the co-operative chooses to maximize and has a slope which is proportional to that of total demand, $D_{agg}$. Recall that the sum of these two areas plus the returns from diversified investments, are the components included in the member welfare function, $MW$, which the co-operative seeks to maximize for an optimal allocation of capital (as defined by equation (2) in section 5.4).

Figure 6.2 Base Case Scenario: Member Welfare
6.1.1 Optimal Solution

Because the model is used as a theoretical tool to illustrate the hypothesis presented earlier in this thesis, the values for the model parameters are not designed to reflect "real-world" values, but rather reflect theoretical abstractions which best represent the problem. The numerical values chosen for the exogenous parameters in the model for the base case scenario are presented in table 6.1. Aggregate demand parameters are set such that the resulting curve is downward sloping and the resulting point elasticity values reasonably reflect true industry demand elasticity (i.e. relatively inelastic). Cost parameters were chosen such that marginal costs were close to 2/3's of marginal revenue, and fixed costs presented approximately 1/3 of total revenue, when the IOFs produce at capacity. The value for the rate of return, \( r \), was set at 25% in order to reflect a healthy rate of return on long-term diversified investments. As well, for ease of illustration and presentation of the results, total co-operative capital, \( K \), and lambda, \( \lambda \), were chosen such that, in equilibrium, the co-operative will choose a capacity level equal to the fixed capacity of each of the private firms, and that private firms will just break even at this point.

Table 6.1: Exogenous Parameter Values for Base Case

<table>
<thead>
<tr>
<th>Aggregate Demand Parameters:</th>
<th>Private Firms Capacity Constraint:</th>
</tr>
</thead>
<tbody>
<tr>
<td>( a )</td>
<td>3</td>
</tr>
<tr>
<td>( b )</td>
<td>0.2</td>
</tr>
<tr>
<td>Cost Parameters:</td>
<td></td>
</tr>
<tr>
<td>( MC )</td>
<td>0.5</td>
</tr>
<tr>
<td>( FC )</td>
<td>0.7</td>
</tr>
<tr>
<td>( Cp )</td>
<td>4.5</td>
</tr>
<tr>
<td>Co-operative Capital Parameters:</td>
<td></td>
</tr>
<tr>
<td>( \alpha )</td>
<td>0.25</td>
</tr>
<tr>
<td>( K )</td>
<td>25</td>
</tr>
<tr>
<td>Rate on Diversified Investments:</td>
<td></td>
</tr>
<tr>
<td>( r )</td>
<td>0.2475</td>
</tr>
<tr>
<td>&quot;Collusion&quot; Parameter:</td>
<td></td>
</tr>
<tr>
<td>( \lambda )</td>
<td>0.4</td>
</tr>
</tbody>
</table>
The optimal values of the endogenous variables calculated from the model, calibrated with the parameter values indicated in table 6.1, are presented in table 6.2. These are the results which correspond to an optimal capital allocation by the co-operative, in that the level of member welfare is maximized (equation (7) in section 5.4). To meet this objective, the co-operative should allocate the bulk of its capital (72%) to primary operations. The resulting presence of the co-operative’s output in the primary market forces the price to remain low, which is clearly in the interest of producers.

Table 6.2: Base Case Scenario: Optimal Capital Allocation

<table>
<thead>
<tr>
<th>Endogenous Variables:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Price ((w))</td>
<td>0.7</td>
</tr>
<tr>
<td>Total Private Production ((X_p))</td>
<td>7</td>
</tr>
<tr>
<td>Co-op Capacity/Production ((X_c))</td>
<td>4.5</td>
</tr>
<tr>
<td>Capital in Primary Market ((K_g))</td>
<td>18</td>
</tr>
<tr>
<td>Co-op Profit</td>
<td>0.2</td>
</tr>
<tr>
<td>Total Private Profit</td>
<td>0</td>
</tr>
<tr>
<td>Co-op Overall Rate of Return</td>
<td>7.73%</td>
</tr>
<tr>
<td>Member Welfare</td>
<td>7.11</td>
</tr>
<tr>
<td>Producer Welfare</td>
<td>15.16</td>
</tr>
<tr>
<td>Demand Elasticity</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

Hence, in the optimal base-case solution, the co-operative is having a strong competitive yardstick effect on the industry. The co-operative is, in a sense, “free riding” by maintaining production well above that of each of the private firms (i.e., the co-operative is refusing to withhold production in order to achieve the joint-profit maximizing solution), which results in positive profits for the co-operative and none for the IOFs. That the IOFs are just breaking even
in this case, is illustrated in figure 6.2, where, at private output $X_p$, the IOFs are just able to cover the costs associated with producing this output, indicated by the average total cost curve for both IOFs, $ATC_p$.

It is important to note that under this scenario a smaller value of $\lambda$ (i.e., more competition between the IOFs), would serve to increase industry output, decrease price, and imply negative profits for the IOFs. Therefore, increased output from the IOFs, would not result in increased profits. This result is illustrated in figure 6.3, which, for different values of lambda (holding all other exogenous variables constant), plots the: optimal level of co-operative output; the corresponding level of IOF output; and the resulting profits for the co-operative and the IOFs. As the IOFs move closer to their joint profit maximizing solution, $\lambda = 1$, their total output declines and their profits increase only marginally, as this also causes the co-operative to allocate more capital towards primary operations. These results imply that the co-operative’s decision to meet producer demands, rather than maximize profits, effectively thwarts the attempts by the private firms to increase their profits through collusion and supply restriction.

![Figure 6.3 Base Case Scenario: Optimal Co-operative Capacity and Selected Endogenous Variables with Changes in Lambda](image-url)
As $\lambda$ increases, one would also expect that higher levels of return on diversified investments will be required for the co-operative to allocate some of its capital into non-primary operations. This is because as the degree of competition in the market decreases, the marginal return to member welfare via a lower market price increases. Figure 6.4 indicates that a rate of at least 40% on diversified investments is required for all levels of lambda to persuade the co-operative to divest from the primary industry entirely, and invest all of its capital in outside enterprises ($K-K_g=25$). On the other hand, if the industry is relatively competitive, and lambda equals 0, a rate of return just under 10% is required for the co-operative to allocate a portion of its capital from primary operations to diversified investments. As lambda increases, however, a rate of return of over 30% is required for the co-operative to invest even the slightest portion of its capital into diversified investments. This is because as the primary market becomes more prone to market power exertion by the IOFs, members will attach an increasingly higher value to the co-operative’s competitive role in that market.

![Figure 6.4 Base Case Scenario: Rates of Return Required to Allocate Total Capital ($K$) to Diversified Investments and Primary Operations ($K_g$)](image)

Figure 6.4 Base Case Scenario: Rates of Return Required to Allocate Total Capital ($K$) to Diversified Investments and Primary Operations ($K_g$)
6.1.2 Adverse Incentives to Diversify

The situation where a co-operative faces pressure to increase its reported rate of return, resulting in an additional incentive to diversify, is now looked at. As was mentioned in section 5.3, this pressure is hypothesised to be the result of the market benefits, (such as lower prices) which arise from co-operative participation in the primary market, being undervalued in comparison to the monetary benefits which impact profit levels. An increased focus on profit levels by a co-operative’s decision makers can be modelled in several different ways. For example, a target rate of return on co-operative operations could be incorporated into the co-operative’s objective function. However, the simplest way to include the hypothesis in this model, is to arbitrarily increase the amount of capital allocated to high-value diversified investments (i.e., reduce $K_g$), which causes an increase in the co-operative’s overall reported rate of return.

Keeping the values for all exogenous variables the same as in the previous case, table 6.3 reports the numerical results from decreasing the amount of capital in primary operations, $K_g$, from the optimal value of 18 units down to 8 units. This causes the rate of return on total co-operative capital (calculated as the net surplus from primary operations plus the return from diversified investments, over the total amount of capital ($K$) available) to increase from 8% to 19%. However, this move comes at the expense of a price increase of 57%, and a resulting welfare drop of close to 10% for all producers in the market. Overall producer welfare (or surplus) is calculated as the entire region under the aggregate demand curve and above price line,
plus the co-operative’s returns from primary operations and diversified investments (as these are also returned to a portion of the producers).

Table 6.3: Model Results: Base Case

<table>
<thead>
<tr>
<th>Selected Endogenous Variables:</th>
<th>Optimal K Allocation</th>
<th>Sub-optimal K Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (w)</td>
<td>0.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Total Private Production (Xp)</td>
<td>7</td>
<td>7.5</td>
</tr>
<tr>
<td>Co-op Capacity/Production (Xc)</td>
<td>4.5</td>
<td>2</td>
</tr>
<tr>
<td>Capital in Primary Market (Kg)</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Co-op Profit</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Total Private Profit</td>
<td>0</td>
<td>3.1</td>
</tr>
<tr>
<td>Co-op Overall Rate of Return</td>
<td>7.73%</td>
<td>18.83%</td>
</tr>
<tr>
<td>Member Welfare</td>
<td>7.11</td>
<td>6.61</td>
</tr>
<tr>
<td>Producer Welfare</td>
<td>15.16</td>
<td>13.73</td>
</tr>
<tr>
<td>Demand Elasticity</td>
<td>-0.3</td>
<td>-0.58</td>
</tr>
</tbody>
</table>

The competitive impact of the co-operative’s presence in the industry has been lost in this situation, resulting in a welfare shift away from the producers and towards the IOFs. This is clearly visible as the private firms are now each able to make three times as many profits as the co-operative. This is because the marginal return from diversified investments is being given higher value by the co-operative than the marginal increase in member welfare (via a lower cost of primary services) which could otherwise be achieved. Therefore, the co-operative is no longer filling the gap between producer demand and the lower output supplied by the private firms, as its focus has shifted away from the primary market, allowing the IOFs to achieve their desired outcome of increased revenues due to collusion and decreased supply.

<sup>9</sup> Note, that the figure presented for member welfare also drops, however, this figure is not significant due to the assumption that members exist who would like to deliver to the co-operative but cannot due to rationing.
Figure 6.5 graphically illustrates the results from a sub-optimal (in terms of member welfare) capital allocation by the co-operative. By comparing figure 6.5 with figure 6.2, one can see that a sub-optimal capital allocation by the co-operative results in the hatched areas of co-operative member surplus and profit becoming noticeably smaller. Overall producer surplus, the entire region below the aggregate demand curve and above the price line, has also declined due to an increase in the market price. At the same time, the IOFs have been able to incur substantial profits, indicated in figure 6.5 by the checked region above the average total cost curve for both private firms (ATC_p) and below the market price.

![Figure 6.5 Base Case Scenario with Sub-Optimal Capital Allocation](image)

The graph shown in figure 6.6 provides further illustration of the results presented above. This graph shows that as the co-operative moves farther away from the solution which optimizes member...
welfare (i.e., where Kg=18 units), and reallocates its capital to diversified investments, overall producer welfare steadily declines. This loss is partially explicable by the corresponding increase in market price, which (multiplied by 10) is also plotted on the graph. Therefore, although the figures for the co-operative percentage rates of return increase, such solutions are not optimal from an overall producer welfare perspective.

6.2 CAPITAL-DEPENDENT COST MODEL

In a second model scenario the assumption that marginal costs and fixed costs do not depend on the level of capital invested in primary operations is dropped. Costs are now assumed to be a function of certain base level costs ($BL_{mc}$ and $BL_{fc}$, for marginal and fixed costs respectively) and the firms’ capacity decisions. Marginal costs for the private firms, $MC_p$, and for the co-operative, $MC_c$, are as follows:

$$MC_p = BL_{mc} - \beta \cdot Cp$$

$$MC_c = BL_{mc} - \beta \cdot X_c$$
Fixed costs are:
\[ FC_p = BL_f + \gamma C_p \]
\[ FC_c = BL_f + \gamma X_c \]

The parameters values selected for this scenario are similar to those used in the base case scenario and are presented in an appendix to this chapter.

Under this new set of cost assumptions, a situation where the co-operative allocates capital in such a way as to maximize member welfare is again compared to a situation where the co-operative is presumed to face pressures to increase its reported rate of return. This second situation is simulated by arbitrarily reducing the amount of capital allocated to primary operations, such that the reported rate of return on all co-operative capital increases (i.e., \( K_g \) is dropped from an optimal level of 17 units, down to a sub-optimal level of 8 units). The results for both situations are presented in table 6.5.

Table 6.5: Results from Capital-Dependent Cost Model

<table>
<thead>
<tr>
<th>Selected Endogenous Variables:</th>
<th>Optimal K Allocation</th>
<th>Sub-optimal K Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price ((w))</td>
<td>0.72</td>
<td>1.1</td>
</tr>
<tr>
<td>Total Private Production ((X_p))</td>
<td>7.031</td>
<td>7.5</td>
</tr>
<tr>
<td>Co-op Capacity/Production ((X_c))</td>
<td>4.345</td>
<td>2</td>
</tr>
<tr>
<td>Capital in Primary Market ((K_g))</td>
<td>17.38</td>
<td>8</td>
</tr>
<tr>
<td>Co-op Profit</td>
<td>0.163</td>
<td>0.26</td>
</tr>
<tr>
<td>Total Private Profit</td>
<td>0</td>
<td>2.92</td>
</tr>
<tr>
<td>Co-op Overall Rate of Return</td>
<td>9.5%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Member Welfare</td>
<td>7.32</td>
<td>7.1</td>
</tr>
<tr>
<td>Producer Welfare</td>
<td>15.32</td>
<td>14.23</td>
</tr>
<tr>
<td>Demand Elasticity</td>
<td>-0.32</td>
<td>-0.57</td>
</tr>
</tbody>
</table>

Overall the results of the model with the new cost assumptions follow closely those results presented under the assumption of constant costs. The primary difference is that the new cost
functions have the result of lowering the marginal cost curve and shifting out the average total cost curve facing the co-operative (MC_c and ATC_c respectively). The cost curves facing the private firms remain the same, however, because their capacity is assumed to be fixed at a level of C_p, throughout. The shift in the cost curves of the co-operative is illustrated in figure 6.7, which represents the case where the co-operative has allocated capital to maximize member welfare and λ =0.4. As was the case in the previous simulation, when the co-operative allocates capital optimally, the resulting equilibrium price, w, lies above ATC_c, resulting in a small profit (0.163) for the co-operative. Again, the private firms are just breaking even in this case because of the pro-competitive impact of the co-operative’s output decision.

Figure 6.7 Capital-Dependent Cost Scenario
An additional difference in this second scenario is presented when sensitivity analysis is undertaken and the degree of collusion is allowed to vary. Figure 6.8 plots the changes in optimal co-operative capacity, corresponding changes in IOF output, and changes in profits as a result of changes in lambda. This graph indicates that if the co-operative allocates its capital in such a way as to maximize member welfare, the IOFs are able to increase their level of profits if they behave competitively. This is because the IOFs are able to realize greater cost efficiencies in this scenario as they produce closer to their level of capacity. This would seem to indicate, that under conditions where the co-operative faces a less efficient cost structure than its IOF competitors, the co-operative’s direct influence on the primary market is lessened, as the IOFs already have an incentive to behave competitively. However, this result is specific to the situation where the IOFs are able to realize economies of scale large enough to offset increased profits which could be realized through collusion (i.e., technology and costs are such that the incentive to collude does not exist), and the co-operative is perceived as maximizing member welfare.

Figure 6.8 Capital-Dependant Cost Scenario: Changes in Co-op Optimal Capacity and Selected Endogenous Variables with Changes in Lambda
When the co-operative reallocates capital away from the optimal solution and towards diversified investments, the reported rates of return for the co-operative increase. However, such a decision, once again, comes at a considerable loss in overall producer welfare. Table 6.5 indicates that an arbitrary drop in co-operative capacity from 4.3 units to 2 units, results in an 11% increase in the rate of return on total co-operative capital. This increased rate of return comes at the expense of a substantially higher market price (a 53% increase) which lowers the welfare of all producers by 7.1%. The drop in producer and co-operative member welfare is somewhat less than the previous base case scenario, however, due to greater cost efficiencies available to the IOFs, which are not available to the co-operative. (Other sensitivity analysis was also conducted under the assumption of capital-dependent costs, however, the results are very similar to the base case, and are therefore presented in an appendix to this chapter.)

In summary, the results from the model simulations presented in this chapter clearly show the significant trade-offs which may exist when a co-operative is hypothesised to allocate capital away from primary operations and towards diversified investments in an effort to increase financial rates of return. Such diversions of capital have significant opportunity costs associated with them due to a reduction in the co-operative’s pro-competitive impact on primary markets characterized by only a few players with the potential for collusive behaviour. This reduction in competitiveness can translate into higher prices for producers, and a resulting overall decrease in the market benefits available to co-operative members.
APPENDIX 6A

The parameter values selected for the model simulations where costs are assumed to be dependent upon the level of capital invested in the firms primary operations, are presented in table 6A.1. The base levels for both costs were selected such that, if all firms were producing at a capacity of 4.5 units, MC and FC would be approximately 2/3 of marginal revenue and 1/3 of total revenue respectively. The initial values of $\lambda$ and $r$ were selected such that co-operative capacity, in the case where capital is optimally allocated, is approximately the same as the capacity available to each private firm (i.e., 4.5 units).

Table 6A.1: Parameters for Capital-Dependent Cost Model

<table>
<thead>
<tr>
<th>Aggregate Demand Parameters:</th>
<th>Private Firms Capacity Constraint:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$a$</td>
<td>$C_p$</td>
</tr>
<tr>
<td>$b$</td>
<td>3</td>
</tr>
<tr>
<td>Co-ops Capital Parameters:</td>
<td>$\alpha$</td>
</tr>
<tr>
<td>$BL_{mc}$</td>
<td>$0.25$</td>
</tr>
<tr>
<td>$BL_{fc}$</td>
<td>$0.68$</td>
</tr>
<tr>
<td>$\beta$</td>
<td>$0.01$</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>$0.02$</td>
</tr>
<tr>
<td>$\lambda$</td>
<td>0.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate on Diversified Investments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r$</td>
</tr>
<tr>
<td>0.2906</td>
</tr>
</tbody>
</table>

Sensitivity Analysis for Capital-Dependent Cost Model

Similar results to the base case model are found when determining the required rates of return on diversified investments needed for the co-operative to allocate capital away from primary operations and towards diversified investments (under the assumption of member welfare being maximized, and allowing the degree of market competitiveness to vary). The results from
this analysis are presented in figure 6A.1. Again, rates of close to 40% on outside investments are required for the co-operative to divest itself entirely of all holdings in primary operations. The rates required for the co-operative to invest capital away from primary operations and into outside investments are higher under the second cost scenario however, as a rate of over 23% is required when lambda equals 0.3. (Values below λ =0.3 were not plotted in this case, as the co-operative incurs a loss beyond this point due to cost inefficiencies.)

![Graph showing rates of return to allocate total capital (K) to diversified holdings and primary operations (Kg).]

**Figure 6A.1: Capital-Dependant Cost Scenario: Rates of Return to Allocate Total Capital (K) to Diversified Holdings and Primary Operations (Kg)**

A similar graph to the one shown in figure 6.6 is shown in figure 6A.2, where the changes in selected endogenous variables are plotted when the co-operative moves away from the optimal capital allocation of 18 units in primary operations. As expected, when the co-operative invests in diversified holdings to a greater degree, its overall reported rate of return increases, and there is a corresponding decrease in producer welfare (due to a steady increase in the primary market
price). However in this case, the returns on total capital investment increase at a greater rate, and the rate of change in producer welfare is somewhat less, due to the variable cost structure of the co-operative.

Figure 6A.2 Capital-Dependent Cost Scenario: Changes in Selected Variables Corresponding to Sub-Optimal Capital Allocations
CHAPTER 7 CONCLUSIONS

7.1 THESIS SUMMARY

The overall objective of this thesis was to examine the integration and diversification strategies of the Prairie Pools, analyse the economic motives behind these decisions, and present the possible implications of these activities on the well-being of members (as users, owners, controllers, and beneficiaries) and on the structure of the co-operatives themselves.

To set the stage for this analysis, an overview of the grain handling industry and the development of the Prairie Pools was presented in Chapter 2. It was noted that significant structural changes have occurred, and continue to occur, in the grain handling industry, as a result of demand shifts and deregulation regarding transportation and the single-desk selling of grains. These changes have led the co-operative grain handling companies to downsize their primary elevator operations, by closing inefficient elevators and investing in fewer, high throughput elevators. At the same time, the Pools have also increased their investments in activities outside of the grain handling industry; a trend which is continuing at an increasing rate.

To understand the economic motives behind the expansionary activities of the Pools, an overview of the unique structure of co-operative organizations was presented in chapter 3. To begin, different sets of co-operative principles were discussed, as they form the basis for the definition of a co-operative as "a user-owned and controlled business from which benefits are derived and distributed equitably on the basis of use (Agricultural Cooperative Service 1987: 12).” The benefits from co-operation were then classified into either: market benefits, those acquired indirectly through greater market competition and access; or monetary benefits, referring to net financial returns from the business operations and investments of the co-operative firm. The
former type of benefit can impact co-operative members’ welfare by increasing the net margins available on their own production activities, while the latter benefit commonly impacts member welfare through the redistribution of co-operative surplus on the basis of patronage.

Some of the problems facing co-operatives were also outlined in chapter 3. Most of these problems stem from the difficulties involved in balancing the varied, and often conflicting, objectives of co-operative players, such as members (in the role of user, owner, controller, and beneficiary) and management. Three of the more crucial problems discussed were: 1) the chronic shortage of capital that many co-operatives face due to the lack of liquid capital markets, which can cause the horizon problems and a tendency for investors (members) to free-ride; 2) the problems associated with following democratic processes without alienating a heterogeneous membership; and 3) adequately balancing the needs of the members with the needs of an efficient, well-run business. The ways in which the varied co-operative objectives have been incorporated into the development of co-operative theory were then briefly reviewed. It was illustrated how the “competitive yardstick” result arises when a co-operative operates in a market with only one, or few, competitor(s). This result is due to the co-operative’s mandate to distribute its net surplus back to its members on the basis of patronage, enabling co-operatives to attract customers away from IOFs.

A detailed analysis of the possible motives behind the Prairie Pools expansion strategies began in chapter 4 with a focus on vertical integration. Vertical investments were defining as maintaining clear links, through continued ownership or control, along the marketing and production chain of Prairie producers. By reviewing the theories developed in both the industrial organisation literature and co-operative development theory, several theories were found to aid in a further understanding of vertical integration by co-operatives in general, and the Prairie Pools in
particular. These included the conventional arguments for vertical integration such as: the 
minimization of transactions costs; overcoming market failure; and to a lesser extent, increasing 
market power. The additional incentive to provide needed services to members was also shown 
to apply to co-operative businesses.

It was concluded that the Pools integration activities are most likely motivated by the 
recognition of increased market benefits on behalf of their members. The basis of this notion is 
quite clear, given that agricultural co-operatives are themselves a form of vertical integration for 
producers. Although few studies examining co-operative vertical integration have been 
undertaken, most would seem to suggest that further integration by co-operatives can have a 
positive effect on producer and consumer markets. However, previous research in the area also 
indicates that it is frequently difficult for co-operatives to engage in expansionary activities due to 
various constraints.

In contrast, the presentation of the conventional arguments for diversification (i.e., to 
realise efficiency gains, pool risk, and cross subsidise), and the application of these theories to the 
case of the Prairie Pools, served to bring up more issues and possible implications than insights. 
No clear conclusions were drawn regarding the analysis of the motives for co-operative 
diversification conducted in chapter 5. Further ambiguities were also raised in trying to determine 
the distinction between integrated and diversified investments. This task proved particularly 
difficult in the case of the Saskatchewan Wheat Pool for two reasons. First, it was noted that the 
presence of the Canadian Wheat Board in grain markets may diffuse some of the possible market 
gains, which may be realised through the investments in activities involving wheat and barley. 
Secondly, some of the investment methods (i.e. external expansion and organisational alliances) 
used by SWP make it difficult to track the company’s of investment activities. Such ambiguities
are of particular significance to members who, as owners and controllers, may wish to have a
greater understanding of their co-operative’s business activities.

An additional hypothesis was then proposed in section 5.3 to further explain co-operative
diversification. This hypothesis was based on the notion that perhaps co-operatives are becoming
increasingly preoccupied with monetary returns. This preoccupation could be the result of several
different pressures facing the co-operative, such as member demands, management interests, or
interests from outside of the co-operative. The particular reasons behind such pressures differ,
however, they are all based on the premise that a higher value is being place on the monetary
benefits from co-operation than the market benefits. This focus on monetary benefits can result in
pressures to increase co-operative rates of return on overall operations. Such pressure may bias
investment decisions away from primary and integrated operations and towards high-value
diversified investments.

A simulation model was developed in section 5.4 to examine in further detail the notion
that a preoccupation with the monetary benefits from co-operation and co-operative expansion,
may not only result in a bias towards diversified investments, but may also have a significant
impact on overall producer welfare. The model results from two different simulation scenarios
were presented in chapter 6; the base case scenario in which costs did not vary with the level of
capital, and a cost scenario in which this assumption was dropped. These results clearly outlined
the possible trade-offs, in the form of market benefits versus increased monetary returns, which
may be associated with co-operative capital investment decisions. The results indicated that
although the decision to diversify may increase reported co-operative rates of return on overall
operations, a significant loss in producer welfare may also result. This is because the pro-
competitive impact that a co-operative may originally have had on the primary market has been
diminished, resulting in a higher industry price (and subsequently lower producer profit margins) and a higher level of profits for private firms exerting market power.

7.2 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

The approach used in this thesis to examine the motives for co-operative expansion was structured in two ways. First, an examination of the economic literature regarding the theoretical arguments developed to explain conventional (IOF) firm expansion and co-operative formation was undertaken to assess the applicability of these theories to co-operatives in general, and the Prairie Pools in particular. It was not the objective of this research to rigorously test these theoretical arguments using the case of the Prairie Pools, but rather, the theories were presented to provide a conceptual framework with which to approach the issue of co-operative expansion. It was concluded that this framework provided a useful starting point from which to examine co-operative vertical integration, but when applied to co-operative diversification strategies, few conclusions could be drawn. This thesis therefore highlights the need for further research regarding co-operative diversification, and in particular, a more detailed examination of the applicability of the conventional diversification arguments to co-operative organizations and the co-operative mandate. To this end, it would be useful to analyse in further detail the different income streams of diversified co-operatives, such as SWP, in an effort to ascertain if efficiency gains have resulted, if risks have been minimized, or if cross-subsidization has occurred.

Secondly, a simulation model was developed to examine an additional hypothesis proposed to explain co-operative diversification. This hypothesis was based on the notion that perhaps the market benefits (i.e., a higher degree of market competitiveness) from co-operation are being undervalued by certain co-operative players, in comparison to monetary returns or profits. However, the validity of this notion is not known, as the existence of pressure on co-
operatives to increase their reported rates of return was not tested. Assessing the validity of the hypothesis, could quite easily be accomplished, however, by surveying different groups of cooperative players. For example: members could be questioned regarding their perceived benefits from belonging to a co-operative; managers could be asked to determine which factors they see as critical indicators of their co-operative’s, as well as their own, success; and credit institutions could be surveyed to determine which measures are used to assess the financial performance of co-operatives, and if market characteristics are taken into account in making such assessments. Such surveys could provide an indication of how important rates of return are in the co-operative decision making process.

Parallel studies involving the analysis of co-operative performance in industries with different market structures would also compliment this study. For example, the cost structures, rates of return, and capital investment figures of co-operatives and IOFs in selected industries could be compared. The price, efficiency, and market opportunities available to producers could also be examined in various markets with and without a co-operative presence. Such analysis would clarify the existence and the value of the market benefits from co-operation, and aid in addressing the potential undervaluation of these benefits by different co-operative interests.

The results of the model developed clearly illustrate that, regardless of the specific reasons behind a co-operative’s increased focus on rates of return, the diversion of capital away from primary operations may cause a significant loss in producer welfare, due to a reduction of the co-operative’s pro-competitive impact on the primary market. However, the model presented is a simulation model, and is therefore built upon certain assumptions which are not always applicable to the “real-world”. An expanded analysis to include additional information would serve to test some of the results presented in chapter 6. Additional analysis incorporating alternative cost
assumptions would clearly be useful, as it was suggested that the competitive role of the co-operative could change significantly, depending on the relative cost efficiencies of both types of firms. A related extension would be to analyse the impact of the proposed hypothesis in a dynamic setting, rather than static setting assumed here. Of particular interest would be the inclusion of the capital choice of the investor-oriented firms, as their participation in the market is highly dependent upon the co-operatives continued participation in the market and the perceived objective function of the co-operative.

7.3 KEY CONCLUSIONS

The vertical integration and diversification strategies of the Prairie Pools are economically interesting as they are being pursued within the context of a co-operative organisational structure. This structure mandates adherence to a set of co-operative principles ensuring user-control, user-ownership, and the distribution of net returns among users based on patronage.

An important difference between the integration and diversification activities of the Pools are the distinct sets of economic incentives which motivate these investments. It was argued that, although co-operative vertical integration may convey market benefits to producers (as such investments can serve to increase the marketing margins of the producer-members themselves) these benefits may not show up on the “bottom line” of the co-operative. Diversification into high-value activities can, on the other hand, provide a co-operative firm with direct monetary benefits in the form of improved financial performance and increased rates of return.

The extent to which the market benefits and the monetary benefits of co-operation are valued differently by various co-operative players can give rise to an important externality, as it may result in biased decisions regarding co-operative capital allocation. A preoccupation with the monetary benefits from co-operation and co-operative expansion may motivate a greater degree
of diversification than is optimal in terms of ensuring that the overall welfare of co-operative members and agricultural producers is maximized.

The case of the Prairie Pools provides a good example with which to examine these issues further, as they have become increasingly involved in a wide range of investment activities both within and outside of the primary grain handling industry. The Saskatchewan Wheat Pool in particular has invested in a broad spectrum of secondary activities, from fertilizer and ethanol production to donut and beer production, and from the marketing of agricultural inputs to the marketing of health and beauty products. Such investments have had a significant impact on both the financial and organizational structure of the Pools. Furthermore, it is increasingly evident that the challenges involved in ensuring member welfare remains foremost in the objectives of the Pools will continue to grow as the co-operatives push towards a broader, more complex, business environment.
REFERENCES


