

**Feasibility of business expansion in the seed
industry**

by

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ABSTRACT

The landscape of the United States seed industry has changed substantially over the last 100 years. In the mid-1930s, there were 115 active seed corn companies marketing seed in the United States. By the 1980s, there were 303 hybrid seed corn companies and in 2016 there were 140 active hybrid seed corn companies in the United States. As the seed industry continues to evolve, so will the logistics and methods of which seed is sold to farm customers.

The purpose of this thesis is to analyze and determine if a seed business expansion provides a positive net present value and rate of return for the management based on the capital costs of the investment and estimated income opportunities. Based on historical information of the existing business and the new market territory opportunities, a ten year projected cash flow was estimated to provide a basis for the net present value and internal rate of return analysis. Sensitivity analysis was applied to different variables in the cash flow model to identify variables of risk and the impact on the projected cash flow and net present value analysis. The projected cash flow model and net present value analysis provides management a basis for the decision to expand their existing business.

The conclusion of the net present value and internal rate of return analysis was that the expansion of the seed business was profitable under most sensitivity scenarios. Recommendations were made for additional research that could be performed to maximize and diversify the business's product offerings and net income.

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CHAPTER I: INTRODUCTION

The Agency is an independent seed dealer for DuPont Pioneer located in Central Illinois. The dealership was established in 1965 and over the course of fifty years, the Agency established itself as a leader in the agricultural input industry in the market territory it serves. The Agency is owned by two brothers that have managed the company for over twenty years. However, the business itself has been in the family since its establishment. During the fifty years, the Agency expanded on two separate occasions. Both expansions were the result of retirements of existing Pioneer seed dealerships and in both cases, the territories were adjoining to existing Agency territory. Today, the Agency is one of the largest Pioneer independent dealerships in the State of Illinois.

The purpose of the thesis is to determine if the Agency should further expand into another market territory. The existing business may have the opportunity to consider another expansion as retirements are forthcoming at adjoining agencies. To determine if an expansion would be a good business opportunity for the company, the return on investment is examined based on a prospective new market territory and based on the potential amount of sales revenue that could be generated.

1.1 Objectives

This research has two primary objectives. The first is to establish a basis for the management of the Agency to consider and determine if expansion into a new market territory is a good business decision. Finally, this thesis is the basis of a business plan presentation for DuPont Pioneer.

To complete the objectives, analysis was completed regarding the current market territory of the Agency and a prospective market territory. A net present value and internal

rate of return analysis were completed to determine if the initial investment in capital assets and the estimated income stream would provide a sufficient return on investment over the life of the business investment. Stress testing is also completed by shocking different variables to determine the impact on net present value and the internal rate of return.

1.2 Methods

Analysis was completed on the investment return of the project. The analysis uses Net Present Value (NPV) and the Internal Rate of Return (IRR) to determine if the project is a profitable venture for the existing business. Additionally, the payback period is calculated to determine the time frame for the recovery of the initial capital investment. The thesis also addresses the drawbacks to each of these financial assessments.

1.3 Financial Information Used

The analysis to determine the feasibility of an expansion into a new market territory uses a combination of historical information and projections. Historical information on the existing agency's operational costs (facility and personnel), as well as the existing agency's historical sales and penetration numbers is obtained. The historical information provides a basis for assumptions to be made for the projected ten year income statement for the new agency. Projected new territory information is determined using a comparable territory to the existing agency operations.

1.4 Approach

After gathering the data needed for the examination of the existing business and the new business, an excel spreadsheet is developed to evaluate breakeven analysis and test the various projected outcomes of different goals and objectives for the potential new market territory. The model provides the following information that is used to determine the feasibility of a prospective agency: ten year projected sales growth numbers; ten years of

projected cash flow; and the net present value and internal rate of return based on the projected cash flow. The model is designed to allow for changes to goals and objectives, a different prospective agency, or additional cash flow variables.

CHAPTER II: U.S. SEED INDUSTRY – RAPID CHANGE IN A CENTURY

The Agency is a full service seed dealership in Central Illinois. The company has two dealerships for DuPont Pioneer. When the company started in 1965, the only product sold was Pioneer seed brand products. However through new opportunities, the company expanded their and services to include: Mapping Services, Agronomy Assistance for Customers, Crop Insurance, Seed Treatment Services, and other Crop Protection / Enhancement Products.

The additional product offerings have allowed the company to use their strong customer base for cross-selling of products; thus taking advantage of economies of scope. With the company considering expanding into the new market, they will also be able to take advantage of economies of scale. The company has considered how they will enter the new market territory and build relationships with the new customer base. Research on Relationship Marketing, the basis for current and future sales is discussed in Chapter 4.

2.1 United States Seed Industry

Through technology and consolidation, the United States commercial seed industry has changed drastically over the last century. In 1960, seed expenditures by farmers in the United States were roughly \$500 Million (Fernandez-Cornejo 2004) and by 2014 had increased to \$12 billion (Schafer 2014). The change in the seed industry is the result of significant research and development that has enhanced seed technology resulting in increased yields and higher production for farmers. The number of seed companies has also changed drastically in this time frame due to mergers and acquisitions. In the mid-1930s, there were 115 active seed corn companies marketing seed in the United States and by the mid-1960s this number increased to 273 companies (Begemann 2016). Today, in the United States, there are 140 active companies marketing seed corn; however, the seed

industry is dominated by four (4) companies; two of which, Monsanto and DuPont make the majority of sales. In the United States corn industry, Monsanto and DuPont Pioneer make 71.3% of the corn seed sales in fiscal year 2015 (Table 2.1).

Table 2.1 Seed Corn Market Share in the United States, 2010 to 2015

Company	2010	2011	2012	2013	2014	2015
Monsanto	34.5%	33.4%	34.4%	34.9%	35.5%	36.7%
DuPont Pioneer	34.7%	35.8%	36.1%	36.0%	34.5%	34.6%
Local/Regional Companies	13.4%	13.0%	11.8%	11.0%	11.3%	10.5%
AgReliant	6.1%	6.6%	6.5%	6.7%	7.0%	7.1%
Dow	4.5%	4.7%	5.2%	5.3%	6.0%	6.1%
Syngenta	6.8%	6.5%	6%	6.1%	5.7%	5.0%

Source: (Begemann 2016)

Similarly, within the soybean industry, DuPont Pioneer and Monsanto made 60.7% of sales as of fiscal year end 2015 (Table 2.2).

Table 2.2 Seed Soybean Market Share in the United States, 2010 to 2015

Company	2010	2011	2012	2013	2014	2015
DuPont Pioneer	31.9%	35.6%	34.0%	34.7%	33.2%	31.2%
Monsanto	25.9%	23.7%	26.0%	26.8%	28.0%	29.5%
Local/Regional Companies	21.4%	20.3%	19.1%	17.9%	18.3%	19.2%
Syngenta	11.0%	10.8%	10.3%	10.1%	9.8%	9.6%
Dow	1.4%	2.0%	3.5%	5.0%	5.2%	5.4%
AgReliant	2.4%	2.6%	3.1%	3.0%	3.1%	3.1%
Public/Saved Seed	6.0%	5.0%	4.0%	2.5%	2.4%	2.0%

Source: (Begemann 2016)

2.1.1 Mega Mergers in the Seed Industry

The seed industry has experienced many mergers and acquisitions over the last century. However, recent proposed mega mergers in the industry have caused concern in the farm community. Some have suggested that 2016 was the year of the Mega Merger in

the agricultural industry. In fiscal year 2016, the value of the mergers represented \$123.74 billion (Bloomberg 2016).

Three substantial mergers / acquisitions were announced that are anticipated to change the landscape of the seed and agronomic supply industry. The first was announced in December 2015 between DuPont and Dow Chemical Company that would create a \$130 billion company (Picker and de la Merced 2015). Upon the merger of the two companies, the combined company will divide the assets into three separate companies – agricultural, material science and specialty products. The agricultural company is expected to be valued at \$16 billion and the new combined company will have a strong and balanced crop protection and seed product selection (Begemann 2016). Together, Dow and DuPont Pioneer would make 40.7% of the United States corn seed sales and 36.6% of the United States soybean sales.

In February 2016, the second mega merger in the agricultural industry was announced, with ChemChina's offer to purchase Syngenta for \$43 billion. ChemChina's interest in this purchase was access and entry to the North American market that Syngenta has established. Syngenta's market share of the corn and soybean seed market has fallen in the last couple years due to class action lawsuits from the MIR corn trait and rejections of American shipments of corn overseas.

In September 2016, Monsanto Company (St. Louis, MO) accepted an offer from Bayer (Leverkusen, Germany) who would pay \$66 billion to the shareholders of Monsanto. This transaction is being called a takeover, rather than a merger. Bayer is a German based health and agricultural company that is looking for access to seed traits to complement their crop protection products.

Mergers and acquisitions may result in economies of scale and economies of scope. With greater resources, companies may have a greater cost advantage. As an example, it is estimated that the Monsanto and Syngenta transaction will save \$1.5 billion for the combined companies, by way of purchasing power and other costs (Bomey 2016). The companies also expect to expand their total products and services offered reducing their average cost of production. Cost reductions also occur through management and streamlining processes for better efficiency.

2.1.2 Consequences of the Mega Mergers

Both farmers and smaller independent seed companies have concerns over the potential mergers. First, the smaller independent seed companies are concerned that the merger of these companies will further result in anti-competitive actions by the surviving companies. Small independent seed companies license seed traits from larger companies such as Monsanto and DuPont Pioneer to be competitive in the marketplace. Research and development costs for new traits is substantial; therefore, smaller seed companies purchase or license the traits from larger companies who are developing the traits (Polansek 2016). Smaller seed companies are concerned that increased cost for traits will occur as the larger companies continue to develop new traits and increase the cost to the independent seed company.

Similarly, farmers have concern regarding the proposed mergers. Currently, farmers have some choices in the traits that they are using. However, with the proposed mergers, there is a potential that fewer choices will be available for farmers. Secondly, with consolidation of some of the largest seed and chemical companies; their ultimately may be less competition in the marketplace. Farmers are concerned that fewer competitors in the industry will result in the inability to negotiate on price. Farmers also fear that with

less competition in the marketplace, innovation of technology will be less important to the larger seed and chemical companies.

In response to these concerns, companies such as Monsanto and Bayer have indicated that the merger of the two companies will enhance the offerings of the customers and the independent seed companies. Monsanto and Bayer together indicate that their combined products will offer farmers more access to seed traits, crop protection, and digital needs. They indicate that they have a strong commitment to research and development in the industry and the synergy between the two companies will benefit the farmers and the independent seed companies. Similarly, DuPont Pioneer and Dow have indicated that through the synergies created, they will be able to offer farmers more competitive products at prices that are fair for the farmer due to improved efficiencies and technologies.

As this time of change in the United States (and global) seed industry continues to evolve, farmers are concerned about the long-term impacts of the mergers and acquisitions. Farmers are looking for stability and consistency from their seed and crop protection companies.

2.2 History of DuPont Pioneer

DuPont Pioneer is a wholly owned subsidiary of E.I. du Pont de Nemours & Co (established in 1802). At fiscal year-end 2015, the company reflected a market capitalization of \$55.5 billion and total sales of \$25 billion. DuPont is a diverse company that is involved in the following industries – electronics and communications, industrial biosciences, nutrition and health, protection solutions (Corian® solid surfaces, Tyvek® brand) performance materials (Zodiaq® Quartz Surfaces), and agriculture (Pioneer® Brand Products). DuPont completed its purchase of the Pioneer Brand in 1999.

In 1926, Henry A Wallace and others founded the Hi-Bred Corn Company. The company was one of the first seed corn companies to focus on hybridization. In 1936, the company added the word “Pioneer” to the name to become Pioneer Hi-bred Corn Company and by 1949, the company was selling one million units¹ of seed corn. In 1973, the company expanded into the soybean marketplace by purchasing soybean products from Peterson Seed Company. Over the next couple decades, the company continued to grow through acquisitions and partnerships with other seed companies. In 1999, DuPont purchased the remaining shares of Pioneer and became a wholly owned subsidiary of DuPont. In 2012, Pioneer announced a name change to DuPont Pioneer (Wikipedia 2016).

The headquarters for DuPont Pioneer are located in Johnston, Iowa. However DuPont Pioneer has business locations in over 90 countries around the world. The company sells to over 70 countries around the world and also sells products and genetics to other seed corn companies. Over the last 90 years, the company has expanded its product lines to include: corn, soybeans, sorghum, sunflower, alfalfa, canola, wheat, rice, cotton, pearl millet, mustard and forage additives (DuPont Pioneer 2016). The company is focused on environmental stewardship and sustainability. The company has focused growth and research in developing counties; specifically in Latin America and Africa.

In 1952, Pioneer’s management wrote the company’s mission statement and called it **The Long Look**; and since that time, the company has adhered to these principles. The core principles of the company are (DuPont Pioneer 2016):

- We strive to produce the best products on the market
- We deal honestly and fairly with our employees, customers, seed growers, sales force, business associates and shareholders.

¹ Unit(s) of seed is specific to quantity sold in the seed industry

- We advertise and sell our products vigorously, but without misrepresentation.
- We give helpful management suggestions to our customers to assist them in making the greatest possible profit from our products.

Through these core principles, the company has established itself as a leader in global seed production and performance. As the Company enters a period of change, the Company has indicated that their core principles will remain.

CHAPTER III: LOCAL AGRICULTURAL INDUSTRY LANDSCAPE

In 2015, the United States planted 318.5 million acres of agricultural production (United States Department of Agriculture 2016). Of that, Illinois accounted for 7% of the total acres or 22.6 million acres. In 2015, roughly 88 million corn acres were planted in the United States and another 82.6 million of soybean acres. Illinois represented 13% of the total acres for corn (11.7 million acres) and 12% of the total acres of soybeans (9.8 million acres). Illinois is ranked number two in total acres of corn and soybeans in the United States; Iowa ranks first in both categories (United States Department of Agriculture 2016).

Central Illinois is known for highly productive class A soils. The Agency’s existing territory is located in LaSalle County, Illinois and in fiscal year 2015, farmers in LaSalle County planted 288,500 acres of corn and 242,000 acres of soybeans (United States Department of Agriculture 2016). LaSalle County is among the top five counties in Illinois for acres planted to corn and soybeans (Table 3.1).

Table 3.1 2015 Illinois Acres Planted - Top Five Counties

<u>County</u>	<u>Corn</u>		<u>Soybean</u>	
	Acres	% of Illinois	Acres	% of Illinois
McLean	319,000	2.73%	300,000	3.06%
Livingston	300,000	2.56%	279,000	2.85%
LaSalle	288,500	2.47%	242,000	2.47%
Iroquois	342,000	2.92%	274,000	2.80%
Champaign	283,000	2.42%	251,000	2.56%
Top Five Total	1,532,500	13.10%	1,346,000	13.73%
Illinois Total	11,700,000		9,800,000	

Source: (United States Department of Agriculture 2016)

The prospective territory is located to the southwest of the existing territory and includes acres in the counties to the south and west including: Livingston, Marshall, Putnam and Woodford. Livingston County has the 2nd most acres planted to corn and

soybeans in the State of Illinois (Table 3.1). Putnam is one of the smallest counties in Illinois with regards to total acres planted. In 2015, Putnam county farmers planted 35,500 acres. Woodford county farmers planted 128,500 acres in 2015 and Marshall County planted 100,500.

3.1 Prospective Territory

The prospective territory and total acres to sell is pre-determined when a seed company takes on a new territory for the Brand. It is understood that there is a pre-determined number of producers that could be sold to within the market territory. For that reason, the Brand doesn't allow multiple retail outlets in the same market territory. The sales staff in a market territory focus on a group of customers and attempts to fully understand that market to ensure correct seed recommendations are made to the producers.

Based on the total acres and producer demographics in a market territory, a potential total units of corn and soybeans available to be sold is determined. The allocation to corn and soybean units is determined by historical corn and soybean rotations in the market territory and information is provided by the seed sales representative. The potential units available in the new sales territory is 25,030 units for corn and 52,000 units of soybeans.

3.1.1 Current Management in the Prospective Market Territory

The prospective territory has been under the same management for nearly thirty years. There is not a single location that the management of this territory operates. The sales function is completed on an individual's farm and seed is stored in a farm shed. The customers in the prospective territory are not currently offered all the services and products that are available through the Brand.

The customers in the territory are not offered bulk soybeans, which means customers are not able to purchase seed in bulk for Pioneer Dupont. Soybeans can only be purchased on a per bag or Pro-box basis. Customers are also not able to warehouse their seed until planting and on-site delivery is not offered. Customers are required to pick up their seed during the months of March and April, as there is not a warehouse for storage.

The new advancements in technology are not being offered by the existing management in the prospective market territory. Customers are not offered soybean treatment, mapping services or onsite agronomy services. These services are compliments to selling seed for the brand that adds value to the customer relationship.

It is the intention of the Agency to offer all the same services to the customers in the prospective territory as they offer to customers in the existing territory. Appropriate staff will be hired that are knowledgeable of agronomic issues and the landscape of the prospective market territory. Providing current and progressive services that add value to a farm operation provides the platform for creating long term customer relationships in the prospective market territory; leading to a profitable relationship between the customer and the Agency.

3.1.2 The Customer

The customer for the Agency in both the existing territory and the prospective territory is an individual that is involved in a farming operation and typically that individual is the decision maker. The customer can be categorized into five types: the owner operator, farm manager, absentee landlord who is on shares with the tenant, the employee that manages the farming operation or an employee of the farm operation. Within the five different categories, the customer demographic in the prospective territory is represented by all ages, farm sizes, different financial capacity and farming practices; similar to the

existing market territory. It is assumed the customers in this market territory need the same services that the existing market territory is receives from the Agency.

A common goal for all customers is to maximize profits and the type of seed and variety to plant plays a key role in achieving that goal. When requested, the customer wants a knowledgeable sales staff to answer questions regarding seed varieties and agronomic options. With the rapidly advancing seed technology, farmers are more reliant on their sales representative to help select the right varieties for the different soil types. A service offered to the customers in the prospective market territory that they currently do not receive from the dealer is agronomic support.

3.2 Competition in the Market Territory

Competition in the seed industry is fierce and highly saturated in the local market territory. There are three of sources where farmers can purchase their seed: cooperatives / independent retail companies, independent seed representatives (example would be the Brand's structure), and independent farmers who sell seed as a secondary source of income. Each of these sources has a unique competitive advantage over each other.

3.2.1 Cooperatives and Independent Retail Companies

Cooperatives and agricultural retail companies are unique and different than the other two sales outlets. They provide a wide array of products and services for the customer, not just seed. The first and most important competitive advantage of these types of retail outlets is that they have the ability to bundle products together to reduce their overall price to the customer. Often, cooperatives and other retailers can provide the customer an overall price per acre for all their input and application costs. Customers find this attractive as they can typically obtain the best price per acre if they purchase all inputs from one retail outlet. The other primary competitive advantage is shareholder

distributions or dividends – this would only apply to the cooperative structure. Many customers find that belonging to a cooperative results in the best prices since they are part of a larger purchasing group and the cooperatives distribute a portion of their earnings to their patrons in years that the cooperative is profitable.

3.2.2 Independent Farmer

Independent farmers have long been a source of seed sales in the United States. Many farmers sell seed to diversify their revenue, especially in tough financial times. Independent farmers typically sell only one brand of seed and focus their sales on neighbor farmers. Nearly all seed companies use this model. It is more common that the regional seed companies use independent farmers as their sales staff.

It is rare that an independent farmer would have a large scale warehouse and office. Most of these seed sales staff work out of their own farm sheds. These seed sales staff do not offer services beyond transactional purchasing of seed. This is a competitive disadvantage for the independent farmer.

In certain situations, the independent farmer can be the fiercest competitor since this is not the only source of revenue for them personally. They offer extremely discounted prices to customers or are able to offer “freebies” as part of their marketing approach. It is common that regional seed companies will use free trips or products as part of their marketing approach to customers.

The independent farmer selling seed does not have the overhead costs of either the cooperative and independent retail companies or the independent seed representative. This is a competitive advantage for the independent farmer selling seed.

3.2.3 Independent Seed Representative

The independent seed representative is what the Agency represents and what the Brand aspires to be. The independent seed representative sells seed exclusively and this is the primary source of income for the business. The independent representative owns their own facilities and equipment and sells seed exclusively for one brand.

The competitive advantage for this type of business model is the ability to be exclusive to a brand and provide all services to customers. Flexibility is also a competitive advantage. The independent seed representative does not answer to a board of directors, as they are their own entity and typically sole proprietorships. Relationship based selling is a focus of this type of business model and customer retention is a focus of the management.

A competitive disadvantage is only selling a single brand and not having the flexibility to diversify income through additional brands of seed. Customers typically like to use more than one brand of seed for their farming operation, to diversity their farm operation. Therefore, when buying from an independent seed representative, they are limited to one brand and customers go elsewhere to purchase a different brand. The inability to bundle inputs is also a competitive disadvantage.

CHAPTER IV: LITERATURE REVIEW

Entering a new market territory for a company can be a challenge, even when the brand itself is known to the potential customer. In the agricultural industry, relationship based purchasing is influenced by the relationship between the producer and the sales staff. For fifty years in the seed industry, the Agency has built their business based on a relationship with the customer with some of these relationships spanning generations. The mission of the company is to deliver high quality innovative products and services to the customers that add value to their farming operation. The customer base in the new market territory is already familiar with the seed brand Pioneer; however, they are not familiar with the Agency. Therefore, the Agency will use a relationship based marketing approach, combined with the idea of creating experiences for the customer that provide the company a competitive advantage.

Relationship based marketing is defined as a marketing approach that emphasizes customer retention and satisfaction, rather than sales transactions. The focus of this marketing strategy is recognizing the longer term value of the customer relationship, rather than each individual transaction. Customer lifetime value is the net present value of the stream of future profits expected over the customer's lifetime of purchases (Kotler and Keller 2012). This marketing approach aligns with the mission of the company; as the goal is to create long term relationships that are beneficial for both the customer and the business.

Marketing researchers have explored the positive and negative attributes of relationship marketing. In one study, researchers found that one of the reasons that companies find relationship marketing a challenge is due to the customer not wanting to engage in the relationship (Jones, et al. 2014). The customer does not want to establish

relationships that provide companies with too much information. Additionally, it is suggested by Fournier (1998) that customers feel that relationships are “all one way” in that companies interrupt the lives of the customer and when the customer has a problem, the company is not available (Jones, et al. 2014).

The basis for relationship marketing is to increase retention rates, decrease price sensitivity and develop the opportunity to cross-sell (Jones, et al. 2014). In a study by Buchanan and Gilles (1990), they found increased profitability for the company from customer retention is the result of eight factors. Four of these factors are: long term customers are less sensitive to price fluctuations, a relationship with a company is satisfying; therefore, the customer is less likely to switch to a competitor. Long term customers are more likely to purchase other products and finally a satisfied customer is more willing to refer a new customer (Toporek 2013). These factors enhance the long term customer value.

4.1 Retention of Customers – Long Term Life Time Value

Retention and attracting new customers is the central focus of the relationship marketing approach. In the seed sales industry, retention and attraction of customers is highly dependent upon product performance, which is an external factor that the Company cannot control. Therefore, each customer interaction needs to be positive to overcome potential product performance issues that may result in a defection of a customer. This is part of creating an experience with the customer in lieu of a simple transaction. The retention for the Agency has been very strong (Table 4.1).

Table 4.1 Existing Company Agency Penetration and Customer Retention

Measurement	Corn			Soybean		
	2015	2016	Territory Average	2015	2016	Territory Average
Penetration %	71%	71%	65%	73%	73%	68%
Customer Retention %	93%	93%	87%	93%	93%	88%

Table 4.1 reflects the two existing Agency’s market territory customer retention and penetration. Customer retention is defined as the percentage of customers that purchased corn or soybeans year over year. Customer penetration is defined as the percentage of customers purchasing corn or soybeans based on a set number of potential customers. The 2015 and the 2016 penetration and customer retention percentages for corn and soybeans is a combined average for each of the two existing agencies. The customer retention and penetration is calculated at the end of the sales season based on total customers sold. When comparing the Agency’s results against the territory average, the Agency is above the territory average.

A focus of customer retention is important for the positive word of mouth from the customer base. There is always the risk when a customer defects, for whatever reason, they may choose to share their concerns with other current or potential customers. Within the seed industry, reasons for customer defection fall typically into the following categories: price, product, service, personnel and the retirement of a customer. Competitive pressures on price and product performance weigh heavily on the decision for a customer to defect. Product and price are external factors that the Agency has limited control over. However, service and personnel are internally controlled by the Agency. It is typical that when a customer defects, they are a customer that doesn’t have a strong relationship with the Agency – they are purchasing a limited amount of seed and they don’t use many services.

The Agency places an importance on customer services and creating a positive experience for each customer.

While retention is a focus of relationship based marketing in an industry; it is also suggested by Buttle (1996) that not all relationships are worth maintaining, primarily from a profitability standpoint – there is a net loss to the customer lifetime value. There are several relationships in the current customer base of the Agency that would not be profitable. There is a greater reputation risk to lose the individuals as a customer. An example of an unprofitable customer is the farmer that purchases minimal seed; however, expects all the service that is available through the Agency. It is assumed that when including the cost of services provided (most of which there is not a cost to the customer), the relationship is not profitable for the Agency. If the Agency were to evaluate who they were going to sell seed based solely on profitably, this decision may cost the Agency revenue in the future. In farming, real estate changes management and ownership frequently and it is not uncommon for a small farmer to become a large farmer rapidly. If the Agency were to break a relationship when it was not profitable in early years, it would be extremely difficult to regain that farmer as a customer.

4.2 Cross Sell of Products

As a company develops relationships and loyalty from customers, the company earns the opportunity to cross-sell other products and services, thus economies of scope begin to develop for the company (Buttle 1996). In fact, Kamakura (2008) suggests that cross-selling actually further develops the customer relationship. Kamakura found the following benefits to cross-selling: “the belief that it costs five times less to serve an existing customer than to acquire a new one”, sales staff will experience 2 to 5 times greater responses than if they were cold selling; relationships with customers deepen;

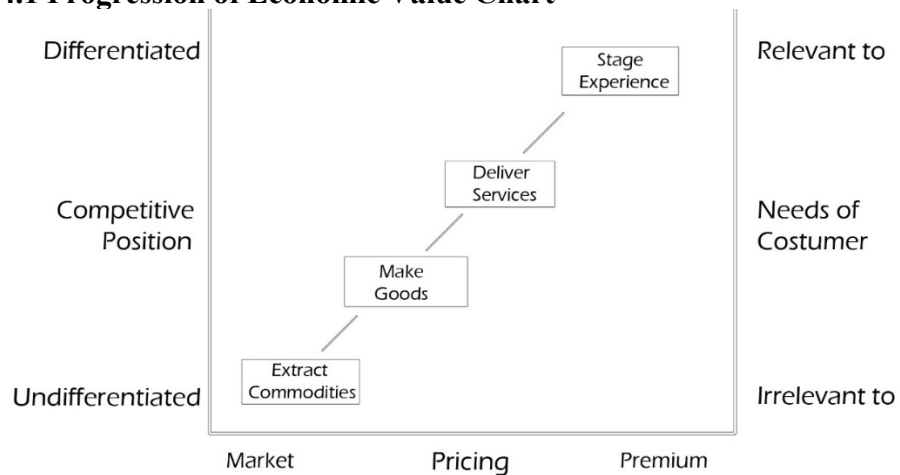
retention rates improve; and finally with the sale of more products, greater understanding of customers' needs develops for the sales staff; thus products offerings can be more tailored for the customer (Kamakura 2008). The ability to cross-sell customers supports operations and absorbs costs. Some of these products / services include: seed treatment, mapping services, crop insurance and other plant inoculants / treatments.

4.3 The Experience

The long term customer and their lifetime value is also dependent upon the experience that a company provides (Pine and Gilmore 1998). Avoiding the idea of commoditized products and focusing on value added services and experiences differentiates a business. At all times, a customer experience occurs and with each touch point with a customer an experience is created (Pine and Gilmore 1998). These experiences are the catalyst for future purchases by the customer – the economic value of the customer.

The progression of economic value (Figure 4.1) depicts the needs of the customer and the competitive position taken by a company:

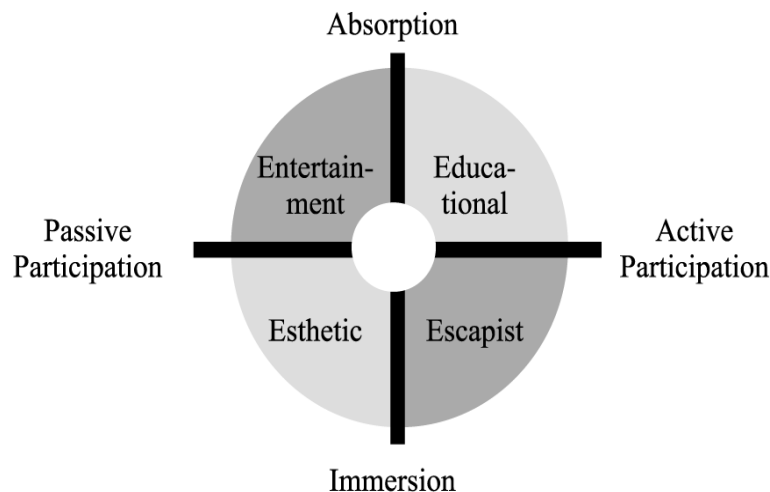
Figure 4.1 Progression of Economic Value Chart



If the company is able to create experiences for the customer, it will differentiate itself from those that simply transact commodities. The more a customer is offered and if the product is personalized to them, the more value the customer will find in the offering of the company. Similarly, as the customers' needs are fulfilled, the company becomes more relevant to the customer (Gurski 2014).

The concept of creating experiences has been a part of the marketing structure for the entertainment industry for years. However, this concept can be applied to all business sectors. Understanding what experience the company wants to provide the customer will drive the differentiation from competitors, thus establishing competitive advantage. Pine and Gilmore suggest there are four (4) realms of an experience (Figure 4.2).

Figure 4.2 Pine and Gilmore Four Realms of an Experience



The four different realms, referred to as the 4E's are based on the participation level of the customer and how the experience affects them (Figure 4.2). Some companies attempt to incorporate all 4E's into their customer experience, while others focus on one or two experiences. The level of customer participation or lack thereof is determined by the

customer and on the offerings of the company. Additionally, a customer can determine how much of the overall experience they want to absorb. Understanding what a customer values as part of their engagement with the company helps the company tailor the experience they want to give the customer.

4.2.1 Creating the Experience

How does the customer experience theory apply to the Agency and the seed service industry? First, understanding that the product sold (seed) is a commodity and there are many substitutes in the marketplace. Since customers have many choices in the marketplace, differentiating the company by creating customer experiences provides a competitive advantage. The idea of experiences ties into the customer's lifetime value – customers are less likely to struggle with price. The brand sold by the Agency is considered a premium product; therefore, clear differentiation needs to be established to sell at a higher premium. Additionally, creating experiences and building relationships leads to greater loyalty of customers that will lead to higher profits for the company.

By maintaining the relationship based strategy of approaching the new market, the Agency has established that they would like to provide the customer with an active experience with the Company.

4.2.2 Differentiation in the Marketplaces

The first component of differentiation is the specialized products that are offered from the Agency. Unlike the cooperative model, the Agency specializes in one product – seed. Therefore, the management and sales staff can focus on a single input, in lieu of all farm inputs. Additionally, selling a single brand of seed allows the staff to fully understand their products, compared to understanding many.

Longevity and credibility in the seed business also differentiates the Agency. It would be very uncommon in the marketplace to find a competitor that has been in the seed business for over 50 years. Local cooperatives perhaps have been in the marketplace for many years. However, their sales staff has turnover and customers are working with new sales staff every few years. The Agency brings stability to the market environment when compared to competitors.

The experience the customer has when working with the Agency is paramount for long term customer confidence and loyalty. In the current territory that the Agency operates, the sales staff has risen to the ‘trusted advisor’ status, through years of interaction and engagement with the customers. The goal of the relationship is to be mutually beneficial – each party activating engaging. As quoted by Tom Belle, President and CEO of Gage Marketing Group, LLC: “Customer engagement, on the other hand, is the totality of a customer's experience and relationship with a brand. Engagement is every interaction- every conversation a consumer has with or about your brand, every moment she spends in your store or on your website, every feeling and opinion she has and shares about you, every referral, every complaint and yes, every transaction” (page 2) (Belle 2013).

This statement describes the idea that each touchpoint with a customer is an experience and is important to the long term relationship. In the seed business, transactions could be answering the phone to answer a planter related question, providing a simple answer to a billing question, even the simple interaction over the phone answering a billing question. The strength of a company’s performance will be validated in the opinions that the customer shares about the business.

The Agency is a family operated business. Therefore, the importance of family is understood and collaboration of all family members make a successful operation. One customer experience that is important to the existing customer base is the annual family appreciation night. The Agency hosts all customers and their families for an evening of fun. This experience not only touches the decision-maker in the business, but the rest of their personnel in the operation (family, key staff or others). The evening includes entertainment, activities for kids, and a meal. Annually, the Agency receives a positive response from customers regarding this event and this event leaves a positive lasting impression and experience for the customer. This event is a way that the Agency differentiates itself from its competitors. No other competitor in the marketplace hosts an event that includes the customer's operational staff and / or family.

CHAPTER V: METHODS AND MODELS

As the Agency considers entering a new market territory, the company's management will determine if the investment will result in a market based financial return for existing ownership. The analysis of the expansion opportunity is analyzed using the net present value (NPV) of the investment and the internal rate of return (IRR).

5.1 Net Present Value

Net Present Value is the difference between the present value of cash inflows and cash outflows taking into consideration the time value of money. This calculation is typically used when a company or investor is considering making an investment or acquisition. The calculation uses different periods of time to determine the inflows and outflows. For the purpose of this analysis, a ten year period is used. The discount rate is applied to the net cash flow for each period.

While the net present value of an investment is a good measurement of future profitability, there are drawbacks to this method of analysis. The primary concern is the many assumptions that are used as part of the project analysis. External risk is also not included in the calculation except through the discount rate. Unforeseen risks can occur in any investment.

5.1.1 Discount Rate

For the last several years, the United States has experienced a low interest rate environment. For the purpose of the investment analysis, several different discount rate scenarios are tested, that provide a comparison as it relates to determining the net present value at different interest rates. Current and historical interest rates were from the Board of Governors of the Federal Reserve System. The initial data included rates back to the

1950s. For the purpose of determining Net Present Value, interest rates over a 10 year period were evaluated from October 2, 2006 to September 30, 2016.

For the purposes of the net present value, five year, seven year, and ten year treasury rates were evaluated. The five year rate was used to provide a short term perspective. The seven year rate is used because the payback period of the initial investment is between years six and eight. To provide a long term perspective the ten year treasury was used.

The ten year average yield was calculated for each of the treasury rates from October 2, 2006 through September 30, 2016. Standard deviations were also calculated. The standard deviation provides insight as to the variation of the interest rates within the ten year period.

Table 5.1 Average Yields of Treasuries

	1 Year	5 Year	7 Year	10 Year	20 Year
Yield as of 9/30/2016	0.59%	1.14%	1.42%	1.60%	1.99%
10 Year Average Yield	0.97%	2.01%	2.46%	2.88%	3.51%
Standard Deviation	1.49%	1.13%	1.03%	0.96%	0.93%

Table 5.1 depicts the average yields of the U.S. Treasuries based on the one, five, seven, ten and twenty years. Based on the rate information above, the yield curve is upward sloping, as the longer the term, the higher the rate. The greatest standard deviation of 1.49% is reflected in the one year rate, which indicates there is greater change in values in the one year rate.

For the purposes of evaluating the net present value, the following six initial rates were evaluated in the net present value analysis: the five, seven and ten year current yield (1.14%, 1.42% and 1.60%, respectively) and the ten year average yield for the seven, ten and twenty year rates (2.46%, 2.88%, and 3.51% respectively). The purposes of testing the

current interest rates was to allow for an evaluation in the current interest rate environment. The ten year historical average was tested for the seven, ten and twenty year rates to allow for interest rate adjustment over the next several years.

Hurdle rates were also established and evaluated for the investment. To account for additional risk above treasuries for this investment, rates of 5.00% and 7.50% were also tested to evaluate the return of capital at higher long term rates.

5.2 Internal Rate of Return

The internal rate of return (IRR) was calculated as part of the analysis. The internal rate of return determines the breakeven return for the investment. The internal rate of return calculation determines the present value of all future cash flow is equal to the initial investment or at what interest rate does the investment breakeven. When analyzing the results of the internal rate of return calculation, the higher the percentage calculated, the more desirable the project.

5.3 Payback Period

The payback period is calculated for each of the different scenarios in the analysis. Unlike the net present value and the internal rate of return, the payback period calculation does not take into consideration the time value of money. The payback period calculates the timeframe an investment will be paid for based on the cash flows from the investment. This calculation was included in the analysis to determine the number of years it would take to recapture the initial capital invested into the expansion project.

One drawback to using the payback period is that it does not take into account the time value of money. Additionally, the tool does not take into account the cash flow period beyond the payback period, which can make a difference in an investment decision.

5.4 Models

To calculate the net present value and internal rate of return for the business investment, supporting models were created to determine the return on investment. A ten year projected quantity sold analysis was first completed as the basis for projected commission revenues as well as expected revenue. Results of the ten year projected quantity sold analysis, provides the basis for the ten year projected cash flow. A net present value and internal rate of return analysis was completed to analyze the profitability of the investment.

5.4.1 Ten Year Projected Quantity Sold Analysis

The first model projected the total quantity of corn and soybean units sold over the ten year period for the prospective agency. Corn and soybean unit sales for the Agency are the measurement for quantity sold are evaluated on an annual basis. Projected sales is based on historical sales for corn and soybeans (measured in units sold) and the total corn and soybean opportunity in the prospective market territory. Table 5.2 indicates that there are 25,030 corn units and 52,000 soybean units available to be sold in the prospective market territory. The existing management is currently selling 21% of corn units and 34% of soybeans units as of the 2016 selling season.

Table 5.2 Prospective Agency Historical Sales

		2015 Unit Sales	2016 Unit Sales
Total Corn Unit Opportunity	25,030		
Historical / Projected Unit Sales		4,100	5,250
% of Corn Opportunity		16.38%	20.97%
Total Soybean Unit Opportunity	52,000		
Historical / Projected Unit Sales		17,000	17,500
% of Soybean Opportunity		32.69%	33.65%

Management driven sales targets for corn and soybean unit sales impact the projections for corn and soybean units sold. The following targets are assumed.

- 1) 80% retention of corn and soybean unit sales for the first two years of operations
- 2) 60% market penetration specific to corn sales for the existing customer base within five years. The existing customer base is defined as the customers that were purchasing products in fiscal year 2016.
- 3) 30% market penetration specific to corn sales for the prospective customer base within five years. The prospective customer base is defined as customer's not currently purchasing corn for Dupont Pioneer in fiscal year 2016.
- 4) 50% market penetration specific to soybean sales for existing customers and prospective customers within five years.

Table 5.3 reflects the projected units sold in the first five years for the territory when applying the sales targets assumed. The projected unit sales for the Agency after year five for corn are 11,007 and the assumption is that 70% of those sales are derived from the existing customer base which would be 7,623 units. The remaining units sold are prospect units. Based on the information in Table 5.3, it is projected that the Agency will have sold less than expected total units to prospects for corn. The Agency would need to sell roughly 300 more units of corn to prospects to achieve the goal of 30% market penetration to prospects.

Similarly with soybeans, the Agency sales target is 50% market penetration for both existing customers and prospects. Table 5.3 reflects projected units sold for soybeans of 26,662 in 2022, of which 17,412 is expected to be sold to existing customers (estimated

52% customer penetration). The remaining units sold are projected to be derived from the prospective customer base.

Table 5.3 Five Year Projected Sales Targets

	Corn			Soybeans		
	2016 Sold	2016 Units Unsold	2022 Projected Sales	2016 Sold	2016 Units Unsold	2022 Projected Sales
Existing Customers	5,250	7,455	7,623	17,500	16,000	17,412
Prospect Opportunity		12,325	3,384		18,500	9,250
Total Unit Opportunity		25,030	11,007		52,000	26,662
% of Opportunity Sold	20.97%		43.98%	33.65%		51.27%

Applying the sales targets, the Agency anticipates increasing the market share in the territory by several percent for both corn and soybeans. Total corn unit sales are expected to increase from 20.97% in 2016 to 43.98%. Similarly, soybean unit sales are expected to increase from 33.65% to 51.27%.

The first goal of the management is to retain the existing customer base, as future business is typically derived from existing customers and it can be challenging to convert a prospect to a customer. For the first two years, the management will employ one full time employee to focus on customers and sales and also a full time administrative support person. The employees will operate out of the new facility that will be constructed to provide a footprint in the market territory.

The goal for the new agency is to retain 80% of existing customer sales in the first year (2018) of operations; therefore, the projected sales for corn and soybeans in the first year is based on 80% of fiscal year 2016 sales of current customers. In year one of operations, a decrease in total units sold is projected. In year two (2019), the model assumes a 20% increase over year one (2018) in sales of both corn and soybeans; which is a modest gain for the second year.

Sales growth begins to be more aggressive in year three through five specifically for corn sales. In fiscal year three (2020), a new employee will be hired to focus on increasing sales to prospective customers and also provide support for the existing customer base of the new territory. Year three (2020) is projected to be the first year the prospective agency would surpass sales of the previous management of the prospective territory. With the hiring of a new sales employee, corn sales are projected to increase 40% over year two, which is 2,000 units of corn. Soybeans sales are expected to increase; however, at a smaller pace only increasing over year two by 15%. Soybean prospective growth may be on the conservative side. Given the total opportunity of soybean sales in the market territory; the 15% increase keeps the prospective Agency on the path to their five year targets for sales.

In year four (2021) and five (2022), the growth rates are scaled back, given the strong year three projected increase in total sales. In year four (2021), corn sales are projected to increase by 30% over year three (2020), or a total of 2,000 additional units of corn. Soybeans are projected to maintain a 15% increase over year three (2020) in total units. In the fifth year (2022), a stronger increase in overall soybean sales is projected, increasing to 20%. Corn sales growth is targeted at a 20% increase over year four (2021). As the Agency becomes more established in the market territory and additional services are offered, it is assumed that increased sales will be realized.

At the end of the first five years of operations, the total units sold for corn will be less than half of the total corn sales opportunity in the market territory (total units sold in fiscal year 2022 is projected to be 11,007 and total opportunity in the market territory is 25,030). Based on the projection, the new Agency will be selling 43.98% of their total

corn unit opportunity. Similarly in soybeans, by year five, the new Agency will be selling 51.27% of their total soybean unit opportunity (total units sold in fiscal year 2022 is projected to be 26,600 and the total opportunity in the market territory is 52,000). Table 5.4. reflects the projected annual growth in total unit sales for corn and soybeans over a five year period.

Table 5.4 Five Year Projected Unit Sales for Corn and Soybeans

	2018	2019	2020	2021	2022
Total Corn Units Sold	4,200	5,040	7,056	9,173	11,007
% of Corn Opportunity	16.78%	20.14%	28.19%	36.65%	43.98%
Total Soybean Units Sold	14,000	16,800	19,320	22,218	26,662
% of Soybean Opportunity	26.92%	32.31%	37.15%	42.73%	51.27%
Commissionable Revenue	\$ 1,792,000	\$ 2,150,400	\$ 2,813,160	\$ 3,520,902	\$ 4,225,082

For the remaining five years of the projected quantity sold model (fiscal year 2023 – 2027), a 2.50% growth rate was used for corn and soybean units. The growth rate is modest and aligns with management’s expectations for annual growth, as well as historical performance of the existing agency. From fiscal year 2014 to 2015, corn unit growth was a modest 2.18% for the existing agency and from fiscal year 2015 to 2016 corn unit growth was strong at 6.03%, which is not sustainable over a period of time. The remaining five years of the model resulted in management increasing sales to 49.76% of the total opportunity for corn and 58.01% of the total opportunity for soybeans (Table 5.5).

Table 5.5 Fiscal Year 2023 – 2027 Projected Unit Sales for Corn and Soybeans

	2023	2024	2025	2026	2027
Total Corn Units Sold	11,283	11,565	11,854	12,150	12,454
% of Corn Opportunity	45.08%	46.20%	47.36%	48.54%	49.76%
Total Soybean Units Sold	27,328	28,011	28,712	29,429	30,165
% of Soybean Opportunity	52.55%	53.87%	55.21%	56.60%	58.01%
Commissionable Revenue	\$ 4,330,709	\$ 4,438,977	\$ 4,549,952	\$ 4,663,700	\$ 4,780,293

Constraints when determining the total projected units sold by the prospective agency over a ten year period are the total units available to be sold as determined by total allocation of corn and soybeans in the prospective market territory. Each agency is assigned a specific area to serve that provides a basis of total opportunity for corn and soybean unit sales. This is determined by the farmers annually based on their planting intentions. For purposes of the analysis, the total units available to be sold for corn and soybeans was held constant for the ten year projected period (total corn sales unit opportunity is 25,030 and total soybeans sales opportunity is 52,000).

5.4.2 Commissionable Revenue Calculation

The ten year projected unit sales model also determined the projected commissionable revenue for the Agency. To determine commissionable revenue, an average price per unit sold for corn was determined to be \$270 and the average price per unit for soybeans was \$47. The average price was determined by the historical average price per unit for the existing Agency. There was no inflation adjustment for the price per unit or bag over a ten year period. The price per unit could and likely will fluctuate over the course of five years; which could be examined in further research.

The commission revenue is based on a percentage and the calculation is private to the brand; however, for purposes of analysis, a modest commissionable income percentage of 8% was used for the baseline projection. The commission percentage could fluctuate up

or down by 2%. There is a risk that a change to the commission structure could occur, which would be an external risk to the prospective agency and the existing agencies.

Changes in commission income is tested and results are provided in Chapter VI.

5.4.3 Ten Year Projected Cash Flow

A ten year projected cash flow was created based on the projected quantity of corn and soybeans sold over a ten year period and the total commissionable income projected. Included in the projected cash flow was additional revenue as a result of cross selling opportunities with customers. Treatment income has been an important revenue source for the existing Agency and will be offered as a compliment to seed sales in the new territory. Projected treatment income is projected based on the following factors:

- 1) Total soybean units treated are based on total projected units of soybeans sold and the percentage of treated soybeans of the existing Agency
- 2) Gross profit per soybean unit treated is based on current gross profit margins of the existing Agency, which is calculated to be \$4.50 per soybean unit. In years three through ten, gross profit per soybean unit treated was lowered to \$4.00 per unit in fiscal year 2020, and \$3.50 per unit in 2022. The decrease in overall treatment income allows for projected compression on gross profit margins in the treatment industry over the next several years.

Included in the projected cash flow are the operational expenses for the new territory. The projected numbers were derived from the existing Agency's operational costs and modified for additional expected startup costs. Operating costs (excluding depreciation) are expected to fluctuate as a percentage of gross revenue from 41% to 57% in the projected ten years. In years five through ten, operating expenses increase as a percentage of gross profit due to the slower growth rate of units sold.

Depreciation is included in the cash flow based on the eligible depreciable assets installed (after Section 179 depreciation). After Section 179 depreciation, eligible dollars for MARCS depreciation is \$232,990. Table 5.6 reflects the annual depreciation allocated to the projected cash flow analysis.

Table 5.6 Cash Flow Depreciation Schedule

<u>Year</u>	<u>Tax Rate</u>	<u>Depreciation</u>
0		
1	14.29%	\$ 33,294
2	24.49%	\$ 57,059
3	17.49%	\$ 40,750
4	12.49%	\$ 29,100
5	8.93%	\$ 20,806
6	8.92%	\$ 20,783
7	8.93%	\$ 20,806
8	4.46%	\$ 10,391

The largest expense of the operating cost is salary. It is projected that the Agency will hire a sales representative in year one (2018) and then an additional sales representative in year three (2020). Upon the hiring the additional sales representative in year three (2020), total units sold are expected to increase for both corn and soybeans at a faster pace.

Pre-tax income is calculated based on the Agency's income and expenses. A tax rate of 30% has been applied to the pre-tax net income to allow for anticipated tax expense for the Agency. To determine after tax cash flows, depreciation expenses are added back to the after-tax net income. The after-tax cash flow calculation is used for the calculation of net present value and internal rate of return.

Table 5.7 After Tax Cash Flow Ten Year Projection

Pre - Tax Net Income	\$	51,006	\$	59,361	\$	73,562	\$	142,946	\$	204,939	\$	209,537	\$	214,136	\$	229,217	\$	244,317	\$	249,063
Tax Expense 30%	\$	15,302	\$	17,808	\$	22,069	\$	42,884	\$	61,482	\$	62,861	\$	64,241	\$	68,765	\$	73,295	\$	74,719
Net Income	\$	35,704	\$	41,553	\$	51,494	\$	100,062	\$	143,457	\$	146,676	\$	149,895	\$	160,452	\$	171,022	\$	174,344
After Tax Cash Flow	\$	68,998	\$	98,612	\$	92,244	\$	129,163	\$	164,263	\$	167,458	\$	170,701	\$	170,843	\$	171,022	\$	174,344

5.4.4 Capital Expenditure Analysis

Startup costs associated with a new territory are primarily for the purpose of brick and mortar. The primary expense is the construction of a new office and shed at an estimated cost of \$467,000. Additionally, to provide full service seed treatment options, a full scale bulk seed site is added to the property. Included in the cost of the bulk seed site would be four upright grain silos including indoor and outdoor conveyors and seed treatment equipment. The addition of the bulk site adds an estimated \$280,000 to the overall project. The business would purchase two seed tenders for on-site seed delivery adding an additional \$45,000.

Total estimated capital expenditure startup costs are \$793,000 (Table 5.8).

Table 5.8 Capital Expenditure Projected Cost

	Estimated Cost
Land Costs - 5 Acres	\$ 60,000
Morton Building - Office / Shed	\$ 286,340
Concrete	\$ 100,000
Four (4) Bulk Bins	\$ 45,000
KSI Conveyors	\$ 85,000
KSI Treater	\$ 150,000
M & W Tender (2)	\$ 45,000
Office Furniture	\$ 15,000
Office Equipment	\$ 6,650
Total Capital Purchases	\$ 792,990

To calculate the net present value and internal rate of return, depreciation was included to determine net investment amount. It is determined that the Section 179 Tax

Depreciation deduction will be used. Section 179 will allow for up to \$500,000 depreciation deduction in the year the fixtures and equipment are purchased. Based on Table 5.8, land is the only ineligible expenditure for depreciation; therefore, \$732,990 is eligible for a depreciation. After Section 179 depreciation is allocated to \$500,000 of the project, \$232,990 is eligible for standard seven year MARCS depreciation.

The \$642,990 capital cost is used as the net investment amount for the net present value and the internal rate of return calculation (Table 5.9). The net investment amount was determined when applying a 30% tax rate to the pre-tax Section 179 depreciation of \$500,000, which is \$350,000 and then adding back the cost of the land (\$60,000) and MARCS allocated depreciation (\$232,990).

Table 5.9 Net Investment for Net Present Value and Internal Rate of Return

Pre-tax Section 179	\$	500,000.00
After Tax Depreciation of 30%	\$	350,000.00
Seven Year Deprecation (MARCS)	\$	232,990.00
Land Cost (non-depreciable)	\$	60,000.00
Net Investment Cost	\$	642,990.00

It is expected that the new agency will purchase and replace capital expenditures in the course of ten years; however, costs associated with replacement are not included in the projected cash flow.

5.5 Assumptions Impacting Projections

To determine the feasibility and return on investment for this project, five primary assumptions were assumed when designing the models. The following are key assumptions made as part of the analysis:

- 1) Quantity of products sold (corn and soybean units and percentage of soybeans treated)

- 2) Annual sales growth rate
- 3) Soybean treatment gross profit margins
- 4) Commission income, as a percentage of total units sold and price per unit
- 5) Corn and soybean opportunity (units) are constant over a ten year period

5.5.1: Quantity of Products Sold and Annual Growth Rate

The quantity of projects sold specific to corn and soybean units and soybean treatment income is driven by the projected annual growth rate of the prospective agency. The growth rate on an annual basis is calculated by the management's five year sales targets. After the first five years; a growth rate of 2.50% is used.

5.5.2 Cross Selling Seed Treatment

Treatment of soybean seed is a compliment to the overall business of the existing Agency and a line of business that has strong margins of profit. The existing agency currently treats 69.50% of all soybean units sold by the agency. The projected ten year cash flow uses a modest assumption that 50% of the total soybean units sold will be treated for all ten years within the projection. A 50% treatment percentage was applied for three reasons – customers potentially decreasing their total cost of production and thus eliminating the treatment expense, customers may already have a source for seed treatment application and many larger farms have and or will install their own treatment applicators to save money. The long term goal of the prospective agency is to treat of 70% of all soybean units sold.

5.5.3 Commission Income

The actual commission percentage that will be paid to the prospective agency cannot be determined or actually calculated by an individual, as the calculation is proprietary to the Brand. For purposes of the analysis, an 8% commission is used as the

baseline commission rate for each of the ten projected fiscal years. The number is based on the expectations of the management and discounted for unexpected changes to the commission structure. Commission could fluctuate 2% up or down.

5.5.4 Corn and Soybean Acre Opportunity

The allocation of corn and soybean acres determines the total units of corn and soybeans that are potentially able to be sold in the market territory is another key assumption to the model. When determining the ten year projection, the 2016 acre allocation and total units of corn and soybeans is held constant. Over the course of ten years; it is probable that the total acres allocated to corn and soybeans will fluctuate based on the farmers crop rotations. A change in the acre allocation has been experienced by the existing Agency as recent as fiscal year 2016, corn acres decreased and soybean acres increased when compared to fiscal year 2015.

The change in acre allocation from corn to soybeans will impact the commissionable income the business receives; however, the business will have the opportunity to make up some of the commission difference through the treatment of soybeans. The additional revenue from treating soybeans will not make up the difference in commissionable income when comparing corn and soybeans; however, it does provide another source of revenue.

5.6 External Variables Impacting Projections

The projections for total units sold and treatment income in the new market territory are subject to external risk factors. The key external risk factors include: product performance, customer retention, demographics of the customer base (average size of the farmers in the new territory) and the merger of Dow and DuPont.

Product performance is one of the key risks in the seed industry. If a particular hybrid underperforms in a market territory, that experience for the customer can greatly impact the chance for a repeat sale in the following year. The existing management has dealt with product performance issues for over 20 years and has relied on relationships to reduce customer defection. In the prospective territory, if a particular hybrid underperforms, the management will not have that existing relationship to fall back on; therefore, providing additional agronomic services and exceeding customer's expectations in the event of a product issue will be very important. In the new territory, it is more likely that if the Brand has a performance issue in a market territory, sales are likely to be impacted negatively.

Customer retention in the new territory will be a risk for the new management; if the existing customer base has too much defection in the first year; it could take several years for the new management to regain those previous customers, thus greatly impacting future sales. Retention of existing customers and sales is very important and focus will be placed on retaining customers during the first two years of operations. To retain customers in the first two years, additional customer relations costs will be incurred. Within the model, customer's relations is an expense and in the first two years is expected to be roughly \$10,000.

Customer demographics in the prospective territory also impacts total units sold, which impacts overall commissionable revenue. From a management standpoint, when entering the new market, focus will be given to every customer. However, those purchasing or having the opportunity to purchase the most seed units will be given additional consideration. Making a sale to a 2,500 acre farmer can be difficult; however,

the sales opportunity is greater and the time spent results in a potential larger payoff. The challenge when prospecting or selling to an existing larger customer is that they have more buying power; thus a lower cost per unit is typically the result. It is important for the new agency to balance the mix of large customers and small customers to maintain the average price per units expected.

The merger between Dow and DuPont could greatly change the Brand and the distribution of seed products within the industry. It is unknown what changes could occur as a result of the merger. However, the existence of the Brand is the overall key to the entire business plan; without the Brand, the business plan does not exist.

CHAPTER VI: DATA ANALYSIS AND SENSITIVITY

Using the variables and models discussed in Chapter V, allowed the feasibility of the project to be analyzed and the results examined by changing some of the assumed variables. The results of the ten year projected cash flow were the basis for the net present value and internal rate of return analysis. Appendix A, reflects the results of the baseline projected cash flow analysis based on a commission rate of 8%, corn unit average price of \$270 and soybean unit average price of \$47. The baseline projections are tested by changing different variables that impact the models.

6.1 Ten Year Projection Results – Baseline Scenario

Total units sold by the new agency is the driver of the projected cash flow. Based on the assumptions discussed in Chapter V, the projected gross profit of the business over a ten year period is estimated. Gross profit reflects a positive trend over the course of ten years. Years one through five reflect gross profit increasing at a faster pace than the remaining five years, due to the reduction in the sales growth rate (Table 6.1).

Table 6.1 Ten Year Projected Gross Profit Results

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Commission 8%	\$ 143,360	\$ 172,032	\$ 225,053	\$ 281,672	\$ 338,007	\$ 346,457	\$ 355,118	\$ 363,996	\$ 373,096	\$ 382,423
Treatment Income										
Projected Units Treated	7,000	8,400	9,660	11,109	13,331	13,664	14,006	14,356	14,715	15,083
Units Gross Price	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50
Gross Treatment Income	\$ 87,500	\$ 105,000	\$ 120,750	\$ 138,863	\$ 166,635	\$ 170,801	\$ 175,071	\$ 179,448	\$ 183,934	\$ 188,532
Cost Of Goods										
Projected Units Treated	\$ 7,000	\$ 8,400	\$ 9,660	\$ 11,109	\$ 13,331	\$ 13,664	\$ 14,006	\$ 14,356	\$ 14,715	\$ 15,083
Cost of Goods / Unit	\$ 8.00	\$ 8.00	\$ 8.50	\$ 8.50	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00
Gross Treatment Expense	\$ 56,000	\$ 67,200	\$ 82,110	\$ 94,427	\$ 119,977	\$ 122,977	\$ 126,051	\$ 129,202	\$ 132,432	\$ 135,743
Treatment Gross Profit	\$ 31,500	\$ 37,800	\$ 38,640	\$ 44,436	\$ 46,658	\$ 47,824	\$ 49,020	\$ 50,245	\$ 51,501	\$ 52,789
Treatment Gross Profit %	36%	36%	32%	32%	28%	28%	28%	28%	28%	28%
Total Gross Income	\$ 174,860	\$ 209,832	\$ 263,693	\$ 326,108	\$ 384,664	\$ 394,281	\$ 404,138	\$ 414,241	\$ 424,598	\$ 435,212

Total units sold is the most important variable to the calculation of gross income, as revenue commission income has the largest impact on the overall gross income and resulting net income of the project. The 8% commission percentage was used to determine the projected commission revenue; however, a scenario analysis that evaluates a change in commission percentage is also completed.

Soybean treatment income is an important part of the overall cash flow for the prospective agency; however, this income source is not guaranteed. Treatment income contributes \$31,500 in the first year or 18% of total gross profit. As soybean units increase, treatment gross income increases; however, as a percentage of total gross profit for the Agency, treatment income becomes a smaller percentage. In year ten, treatment income is \$52,789 or 12% of total gross profit. If this income were removed from the overall ten year baseline cash flow, the net present value and the internal rate of return would still reflect an acceptable investment.

The net present value and internal rate of return for the investment were estimated using the cost of the investment of \$642,990, which is the result of the adjustment for depreciation. The results of the baseline scenario are as follows:

Table 6.2 Baseline NPV and IRR Results at 8% Commission

Term	5 Year	7 Year	10 Year	7 Year Average	10 Year Average	20 Year Average
Discount Rate	1.14%	1.42%	1.60%	2.46%	2.88%	3.51%
IRR	14.72%	14.72%	14.72%	14.72%	14.72%	14.72%
Net Present Value	\$ 669,695	\$ 647,702	\$ 633,826	\$ 570,256	\$ 540,771	\$ 498,352
Payback Period	6	6	6	6	6	6

Applying the baseline variables and projected income over a ten year period; the net present value and required rate of return are positive. These results indicate that the investment would be a positive investment decision for the existing management. The

payback period is estimated to be six years; meaning the initial investment capital would be returned in full within the first six years of the investment (Table 6.2).

When comparing the interest rates used for the investment analysis, there is a \$171,343 difference between the highest rate (ten year historical average of the twenty year rate and the current five year rate); which means that as the value of money (interest rate) increases, there may be better uses of the investment capital than the project (Table 6.2). When interest rates are closer to zero; the time value of money has a lesser impact on the net present value analysis. For the results of the net present value analysis, the ten year average rate is used in the sensitivity analysis for the investment project. The ten year average rate was selected as the current interest rate environment is on an upward trend and the cash flow projections are based on a ten year period.

Table 6.3 Hurdle Rate NPV and IRR Results at 8% Commission

	5.00% Hurdle	7.50% Hurdle
Term	Rate	Rate
Discount Rate	5.00%	7.50%
IRR	14.72%	14.72%
Net Present Value	\$ 405,999	\$ 272,897
Payback Period	6	6

The hurdle rates of 5.0% and 7.5% were also evaluated, which provided an evaluation of the net present value in a higher interest rate environment when accounting for some of the risk in the project. Table 6.3 shows the results of the higher interest rate environment and hurdle rates for the company. The net present value reflects a decrease which is expected as the discount rate applied increases. Results of the net present value hurdle rate analysis confirm the investment should be considered at interest rates of 5.00% and 7.50%.

6.2 Sensitivity Analysis

Results of the baseline projection are promising. Many assumptions were used to complete the projection. To test the different assumptions that were used in the analysis, three different sensitivity analyses were completed to evaluate the impacts on net present value, internal rate of return and the payback period. Sensitivity tests were completed for a change in price per unit for corn and soybeans, commission changes, and a decrease in total unit sales.

6.2.1 Commission Sensitivity

Commission paid to the prospective agency is based on total unit sales, average price per unit sold. The baseline projection is for a commission percentage of 8%. However, commission could range from 6% to 10%. A sensitivity analysis was completed that tested the change in percentage of commission.

Net present value was calculated based on the ten year average rate (over a ten year period). Cash flows for period one through ten were calculated based on the following commission rates – 6%, 7%, 8% (baseline), 9%, and 10%.

Table 6.4 NPV and IRR Sensitivity to Commission Percentage Change

	6% Commission Rate	7% Commission Rate	Baseline 8% Commission Rate	9% Commission Rate	10% Commission Rate
	10 Year Average	10 Year Average	10 year Average	10 Year Average	10 Year Average
Discount Rate	2.88%	2.88%	2.88%	2.88%	2.88%
Period					
0	\$ (642,990)	\$ (642,990)	\$ (642,990)	\$ (642,990)	\$ (642,990)
1	\$ 43,910	\$ 56,454	\$ 68,998	\$ 81,542	\$ 94,086
2	\$ 68,506	\$ 83,559	\$ 98,612	\$ 113,665	\$ 128,718
3	\$ 52,859	\$ 72,552	\$ 92,244	\$ 111,936	\$ 131,628
4	\$ 79,870	\$ 104,516	\$ 129,163	\$ 153,809	\$ 178,455
5	\$ 105,112	\$ 134,688	\$ 164,263	\$ 193,839	\$ 223,414
6	\$ 106,828	\$ 137,143	\$ 167,458	\$ 197,773	\$ 228,088
7	\$ 108,555	\$ 139,628	\$ 170,701	\$ 196,872	\$ 232,847
8	\$ 107,144	\$ 138,994	\$ 170,843	\$ 197,668	\$ 234,543
9	\$ 105,730	\$ 138,376	\$ 171,022	\$ 198,517	\$ 236,314
10	\$ 107,420	\$ 140,882	\$ 174,344	\$ 202,527	\$ 241,268
Payback Period	8	7	6	5	5
IRR	5.51%	10.43%	14.72%	18.40%	22.15%
NPV	\$102,667	\$321,719	\$540,771	\$ 743,838	\$978,875

The change in commission percentage greatly impacts the overall net present value and the internal rate of return of the investment. Comparing the results of the ten year average rate, the 6% commission rate reflects a return of \$102,667 on the initial investment over ten years, compared to the baseline commission of 8%, that reflects \$540,771 and finally the 10% commission rate, that reflects a \$978,875 net present value. A difference of \$876,208 is reflected between the high and low of the ten year average rate. At that large of a difference in net present value, the percentage of commission that is paid becomes a strong consideration for the management when considering the investment.

The hurdle rates of 5% and 7.5% were tested for each commission rate scenario. Only when applying the 7.5% rate to the 6% commission rate, net present value results were negative. Careful consideration should be given before moving forward with the investment the higher the discount rate.

While both the net present value is positive in nearly all commission structures, the unquantifiable impacts may outweigh the positive results. Unquantifiable results would be added managerial stress, unknown risks, and unknown impacts to the existing agencies.

6.2.2 Corn and Soybean Average Unit Price Sensitivity

A key assumption in the ten year cash flow model is that the average price per unit for corn and soybeans will not change and is based on an average historical sales price for the existing agency. Therefore, the model did not a change in the price per unit. There is a strong probability that the price per unit will change over a ten year period. It is unknown if the price will increase or decrease. As the farm economy experiences tighter cash flows, farmers (customers) are more conscious of how much they are spending on a per acre basis. As a result, there will be increased pressure from customers to decrease price. There is also the possibility that an increase in the price per unit for corn and soybeans will occur as a result of improved technology.

A sensitivity analysis was completed to test the change in price per unit and the resulting impact on net present value and internal rate of return. An increase and a decrease in price per unit were tested. Net present value and internal rates of return were calculated based on the ten year average treasury rate (over a ten year period). Cash flows for period one through ten were calculated based on the baseline projections for total units sold at an 8% commission rate; only modified by a change in corn and soybean unit cost. There were no changes to the operating expenses.

Table 6.5 NPV and IRR Sensitivity to Average Price / Unit Corn and Soybeans

		Baseline \$270 per unit corn and \$47 per unit soybeans	\$250 per unit corn and \$40 per unit soybeans	\$290 per unit corn and \$40 per unit soybeans
		10 Year Average	10 Year Average	10 Year Average
Discount Rate		2.88%	2.88%	2.88%
Period				
0	\$	(642,990)	\$ (642,990)	\$ (642,990)
1	\$	68,998	\$ 58,806	\$ 68,214
2	\$	98,612	\$ 86,382	\$ 97,671
3	\$	92,244	\$ 76,767	\$ 92,573
4	\$	129,163	\$ 110,180	\$ 130,727
5	\$	164,263	\$ 141,484	\$ 166,140
6	\$	167,458	\$ 144,109	\$ 169,382
7	\$	170,701	\$ 146,768	\$ 172,673
8	\$	170,843	\$ 146,312	\$ 172,864
9	\$	171,022	\$ 145,877	\$ 173,093
10		174,344	148,571	176,468
Payback Period		6	7	6
IRR		14.72%	11.42%	14.86%
NPV		\$540,771	\$370,653	\$550,500

The results show the impact of the average price per unit for corn and soybeans on net present value and internal rate of return (Table 6.5). Net present value and internal rate of return remain positive in all scenarios; however, as price per unit decreases, the net present value and internal rate of return decreases in value. When applying the hurdle rates of 5% and 7.5% to the sensitized scenarios above, the results confirm a positive net present value.

6.2.3 Total Corn and Soybean Units Sold Sensitivity

Baseline projections reflect total units sold in the prospective agency is based on management's sales targets over the first five years and a 2.5% growth rate for the remaining five years. The total units sold impacts commissionable revenue for the company, as commissionable revenue is calculated by total units sold multiplied the average price per unit, specific for corn and soybeans. A change in the total units sold will impact either positively or negatively cash flow and thus net present value and internal rate of return over a ten year period.

A sensitivity analysis is completed to test the impact to net present value and internal rate of return if the overall units sold were reduced when compared to the baseline projection. An increase in total units sold is not tested, as it is known based on the results of the baseline net present value and internal rate of return analysis that the investment is positive, so an increase in total units would only further increase the net present value and internal rate of return.

For year one of the sensitivity analysis, a decrease of 20% was reflected over fiscal year 2016 results (same assumption as in the baseline projections), as it is likely there will be some customer defection. For years two through five, an increase in sales of 15% was used. A 15% annual increase would be a modest assumption compared to the management targets for the prospective agency. The remaining five years are based on a 2.5% growth rate, which is the same as the baseline projection. The price per unit for corn and soybeans was held constant at \$270 for corn and \$47 for beans and a commission percentage of 8%. Table 6.5 reflects the change in total units sold compared to historical sales of the prospective agency and the baseline projected sales.

Table 6.6 Reduced Total Units Sold

		Historical		Projected	
		2015 Unit Sales	2016 Unit Sales	Baseline 2027 Sales	15% Growth Rate 2027 Sales
Total Corn Unit Opportunity	25,030				
Historical Unit Sales		4,100	5,250	12,454	8,311
% of Corn Opportunity		16.38%	20.97%	49.76%	33.20%
Total Soybean Unit Opportunity	52,000				
Historical Unit Sales		17,000	17,500	30,165	27,704
% of Soybean Opportunity		32.69%	33.65%	58.01%	53.28%

A 15% growth rate over years two through five would materially impact total units of corn sold; a decrease of 4,143 units is reflected compared to the baseline projections. Soybean unit sales are not impacted as significantly, as their projected growth rate was not

as aggressive as the corn growth rate in the baseline projections. Soybean units would reflect a difference of 2,461 between the baseline projections and the standard 15% growth rate.

A reduction in units sold also impacts commissionable revenue. Comparing baseline projected 2027 commissionable revenue to the reduced sales commissionable revenue, a difference of \$1,234,211 is reflected, which is a sizable difference that will materially impact cash flow. Projected pre-tax net income before tax in year 2027 for the baseline projection was \$249,062 and when varying total units sold, pre-tax net income before tax in year 2027 would be \$146,018 when using an 8% commission rate.

Table 6.7 NPV and IRR Sensitivity to Total Units Sold for Corn and Soybeans

	5 Year	7 Year	10 Year	7 Year Average	10 Year Average	20 Year Average	Hurdle Rate	Hurdle Rate
Discount Rate	1.14%	1.42%	1.60%	2.46%	2.88%	3.51%	5.00%	7.50%
Payback Period	8	8	8	8	8	8	8	8
IRR	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%
NPV	\$221,006	\$207,442	\$198,880	\$159,622	\$141,393	\$115,143	\$57,886	(\$24,935)

The results of net present value and the internal rate of return indicate that the investment would be a good financial decision; however, both indicators are significantly less when compared to the baseline projected results. The payback period increased from six years in the baseline projection to eight years (Table 6.7). When applying the hurdle rates of 5.0% and 7.5%, the higher the discount rate, the weaker the net present value becomes. The investment would need to be carefully considered at the higher hurdle rate of 7.5%.

6.2.4 Sensitivity Conclusion

When comparing the results of the three different scenarios; the greatest impact to net present value and internal rate of return is the percentage of commission paid, followed

by total units sold. The discount rate used also impacted the net present value; the higher the discount rate used, the lower the net present value.

Two additional scenarios were tested for comparison purposes and additional stress testing. The first test was a change in both quantity and the average price per unit sold. This scenario changed two main variables - the price per unit of corn to \$250 per unit and the price per unit for soybeans to \$40 per unit and the total quantity sold for corn and beans. Quantity sold used the 15% growth rate for years two through five and 2.50% for the remaining five years. An 8% commission rate was used and no changes were made to operating expenses. As a result of this scenario, both net present value and internal rate of return remained positive indicating the investment would still be a good use of the initial investment funds. The payback period increased to nine years as a result of a decrease in cash flow per period.

Table 6.8 Sensitivity to Total Units Sold, Commission and Average Price Per Unit

	Quantity and Price Sensitivity and 6%			
	Quantity and Price Sensitivity		Commission	
	10 Year	10 Year Average	10 Year	10 Year Average
Discount Rate	1.60%	2.88%	1.60%	2.88%
Payback Period	9	9	16	16
IRR	2.94%	2.94%	-8.06%	-8.06%
NPV	\$49,086	\$2,250	(\$282,188)	(\$305,469)

When applying the hurdle rates of 5% and 7.5% to the quantity and price sensitivity scenario, results reflect a negative net present value for both discount rate scenarios, (\$65,817) and (\$133,372), respectively. This would be an indication that at investment should be carefully considered based on the discount rates analyzed.

Taking the above referenced scenario one step further, the commission variable was adjusted. Commission was adjusted to 6%, which would be least amount of commission

paid to the prospective agency. As a result, both net present value and internal rate of return reflect a negative value, indicating that the investment would not be a good financial decision (Table 6.8). The payback period increased to 16 years. When applying the hurdle rates to this scenario, net present value results further deteriorate.

Baseline data analysis confirms the investment should be considered based on positive net present value and internal rate of return. Sensitivity analysis confirms most scenarios have positive results; with the exception of combined quantity, price and 6% commission sensitivity test. The discount rate applied to the net present value analysis also impacts the net present value results; the higher the discount rate, the lower the net present value of the investment.

CHAPTER VII: CONCLUSION

The primary objective of the research was to analyze the feasibility of expanding an existing business into a new market territory. The net present value, internal rate of return and payback period were calculated. Results of research concluded that the management should consider expanding into the prospective territory based on results of the baseline projections and sensitivity analysis.

7.1 Limitations of Research

The information available for this project was limited in scope, as information was proprietary to the Brand and to the existing agency. As a result, assumptions were made to project a ten year cash flow. Commission income is one key assumption and that assumption impacts the overall results of the investment analysis. A baseline commission rate of 8% was used for the primary results of the research. Since the commission rate of 8% is not certain; sensitivity analysis was completed that further analyzed the impacts of commissionable income on the cash flows of the new agency.

Total quantity of corn and soybean units available for sale and the price per unit for corn and soybean units were assumed. It is unknown what the corn and soybean acre allocation may be in the next ten years, which establishes the total units that would be available to sell within the territory. It would be unlikely that a significant change in overall corn and soybean allocation would occur; therefore, total opportunity for corn and soybean unit sales was held constant.

The average price per unit for corn and soybeans will likely change over a ten year period. However, it is unknown if the price will increase as a result of advanced technology or if the price will decrease as a result of input cost pricing pressures. The unknown of average price per unit resulted in holding the cost constant at \$270 / unit of

corn and the \$47 / unit of soybeans; which is based on historical average price per unit of the existing agency.

7.2 Steps Forward

Based on the results of the research completed, the management of the existing agency will need to present a business plan to the Brand for consideration. Portions of this thesis research will be included in the presentation to the Brand.

To support the financial analysis of the investment project, the management will send out a survey to their existing customer base to better understand where the existing agency is underperforming their competitors and what their existing customer base values from a service and sales perspective. The results of the customer survey will assist management in determining what specific services or products their customers value; which will provide a basis for what services or products should be offered in the prospective territory.

7.3 Conclusion

Based on the research that was completed that evaluated the economic feasibility of the expansion project, it is determined that the management of the existing agency should consider moving forward with obtaining the adjoining sales territory for the Brand. Based on the results of the net present value and internal rate of return, the investment is expected to be profitable.

The models created could be used for other managers that are considering entering a market territory for the Brand. The model is interactive and variables such as units available to be sold, average price per unit and commission rate can be changed to align with different prospective territories. A recommendation for management would be to obtain the specific territory information from the brand, such as total units available for

sale, commission rate schedule based on sale and an estimated price per unit of corn and soybeans that the Brand is expecting for the next five to ten years.

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APPENDIX A

TEN YEAR PROJECTED CASH FLOW

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Commission	8%	\$ 143,360	\$ 172,032	\$ 225,053	\$ 281,672	\$ 338,007	\$ 346,457	\$ 355,118	\$ 363,996	\$ 373,096	\$ 382,423
Treatment Income											
Projected Units Treated		7,000	8,400	9,660	11,109	13,331	13,664	14,006	14,356	14,715	15,083
Units Gross Price		\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50
Gross Treatment Income		\$ 87,500	\$ 105,000	\$ 120,750	\$ 138,863	\$ 166,635	\$ 170,801	\$ 175,071	\$ 179,448	\$ 183,934	\$ 188,532
Cost Of Goods											
Projected Units Treated		\$ 7,000	\$ 8,400	\$ 9,660	\$ 11,109	\$ 13,331	\$ 13,664	\$ 14,006	\$ 14,356	\$ 14,715	\$ 15,083
Cost of Goods / Unit		\$ 8.00	\$ 8.00	\$ 8.50	\$ 8.50	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00
Gross Treatment Expense		\$ 56,000	\$ 67,200	\$ 82,110	\$ 94,427	\$ 119,977	\$ 122,977	\$ 126,051	\$ 129,202	\$ 132,432	\$ 135,743
Treatment Gross Profit		\$ 31,500	\$ 37,800	\$ 38,640	\$ 44,436	\$ 46,658	\$ 47,824	\$ 49,020	\$ 50,245	\$ 51,501	\$ 52,789
Treatment Gross Profit %		36%	36%	32%	32%	28%	28%	28%	28%	28%	28%
Total Gross Income		\$ 174,860	\$ 209,832	\$ 263,693	\$ 326,108	\$ 384,664	\$ 394,281	\$ 404,138	\$ 414,241	\$ 424,598	\$ 435,212
		18.01%	18.01%	14.65%	13.63%	12.13%	12.13%	12.13%	12.13%	12.13%	12.13%
Expenses											
Salaries		\$ 45,000	\$ 46,350	\$ 97,741	\$ 100,673	\$ 103,693	\$ 106,804	\$ 110,008	\$ 113,308	\$ 116,707	\$ 120,208
Employee Bonus / Relations		\$ 5,500	\$ 5,665	\$ 8,835	\$ 9,100	\$ 9,373	\$ 9,654	\$ 9,944	\$ 10,242	\$ 10,549	\$ 10,866
Professional Fees		\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700	\$ 1,700
Fuel		\$ 7,300	\$ 7,665	\$ 8,048	\$ 8,451	\$ 8,873	\$ 9,317	\$ 9,783	\$ 10,272	\$ 10,785	\$ 11,325
Utilities		\$ 9,060	\$ 9,332	\$ 9,612	\$ 9,900	\$ 10,197	\$ 10,503	\$ 10,818	\$ 11,143	\$ 11,477	\$ 11,821
Repairs		\$ 2,000	\$ 2,200	\$ 2,420	\$ 2,662	\$ 2,928	\$ 3,221	\$ 3,543	\$ 3,897	\$ 4,287	\$ 4,716
Customer Relations		\$ 10,000	\$ 10,500	\$ 11,025	\$ 11,576	\$ 12,155	\$ 12,763	\$ 13,401	\$ 14,071	\$ 14,775	\$ 15,513
Depreciation		\$ 33,294	\$ 57,059	\$ 40,750	\$ 29,100	\$ 20,806	\$ 20,783	\$ 20,806	\$ 10,391	\$ -	\$ -
Other		\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Total Expenses		\$ 123,854	\$ 150,471	\$ 190,130	\$ 183,162	\$ 179,725	\$ 184,744	\$ 190,003	\$ 185,024	\$ 180,281	\$ 186,149
Pre - Tax Net Income		\$ 51,006	\$ 59,361	\$ 73,562	\$ 142,946	\$ 204,939	\$ 209,537	\$ 214,136	\$ 229,217	\$ 244,317	\$ 249,063
Tax Expense 30%		\$ 15,302	\$ 17,808	\$ 22,069	\$ 42,884	\$ 61,482	\$ 62,861	\$ 64,241	\$ 68,765	\$ 73,295	\$ 74,719
Net Income		\$ 35,704	\$ 41,553	\$ 51,494	\$ 100,062	\$ 143,457	\$ 146,676	\$ 149,895	\$ 160,452	\$ 171,022	\$ 174,344
After Tax Cash Flow		\$ 68,998	\$ 98,612	\$ 92,244	\$ 129,163	\$ 164,263	\$ 167,458	\$ 170,701	\$ 170,843	\$ 171,022	\$ 174,344