

EXAMINING SPECIALTY CROP PRICE RELATIONSHIPS BETWEEN FARMERS'
MARKETS AND GROCERY STORES

By

ASHLEY NICOLE EARL

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To my family, who motivated, inspired and guided me to be the person I am proud to be today. Your words of wisdom and unconditional love have allowed me to have the opportunity to succeed; without you as my rock, I am nothing.

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LIST OF ABBREVIATIONS

Factors of Production	This is an economic term to describe the inputs that are used in the production of goods or services in the attempt to make an economic profit. The factors of production include land, labor, capital and entrepreneurship.
Farmers' Market	A farmers' market is a market or group of stalls and booths where farmers and sometimes other vendors sell their products directly to consumers.
Locavore	A locavore is someone who eats food grown or produced locally or within a certain radius such as 50, 100, or 150 miles (240 km).
Residual Demand	The residual demand curve is the individual firm's demand curve, which is that portion of market demand that is not supplied by other firms in the market.

Abstract of Thesis Presented to the Graduate School
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By

Ashley Nicole Earl

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Chair: Michael A. Gunderson
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Farmers' markets across the state of Florida have been increasing in popularity over the past three decades, showing an steady increase over the past two years. Very little information is available regarding the price relationship between farmers' markets and nearby grocery stores. Further investigation of this relationship was necessary and yielded vital information to support further understanding of pricing trends between these two sources. By obtaining prices from both farmers' markets and grocery stores that are closest to each of the markets, a pricing model and price difference percentages were created to address the intended objectives of: advising vendors at farmers' markets on how to competitively price their produce and conveying price differences between the two sources to vendors. Through this, vendors and consumers will have tangible information regarding whether a farmers' market or grocery store offers the lowest prices for specialty crops. Farmers that participate in the markets will also have a better understanding of how to more so competitively price their products and how much of a profit they are losing out on.

Prices at farmers markets resemble anywhere from a 10 to 50% discounted rate when compared to surrounding grocery stores. The following two hypotheses were tested:

1) Average prices of produce and vendor full-time status influence overall average percent price differences between farmers' markets and grocery stores.

2) Determine if the following factors affect the price of produce at a farmers' market: average grocery store price, whether or not the farmers' market vendor's prices are influenced by current grocery store prices, whether the vendor is considered to be full-time or part-time, the total acres used throughout their operation, how many years they have participated in farmers' markets, their age, and dummy variables for the defined regions throughout Florida.

The testing of the hypotheses supported the lending of support to show that they are correct. All of the data used for this project was collected in person on a one-on-one basis. Further data and regression analysis yielded a pricing model to advise vendors how to competitively price their produce, as well as average price difference percentages that convey to vendors how much potential profit they are missing out on. The results contribute to the support of the two stated hypotheses.

Many consumers are looking for less expensive alternatives to the increasing grocery food and produce prices at grocery stores. By distributing information and making the public more aware of discounted—often better quality produce—Florida consumers will enjoy savings on their grocery bill and will be more inclined to purchase produce at local farmers market.

CHAPTER 1 INTRODUCTION

Overview

Farmers' markets offer an outlet for producers to sell a variety of produce, as well as specialty items that are not found at other stores, directly to consumers. Many farmers' markets offer a unique shopping experience for consumers; some even offer lower prices on produce, when compared to grocery store prices. Throughout this study, we will investigate the relationship between farmers' market produce pricing and grocery store produce pricing. Results will be expressed through a pricing model that will help vendors at farmers' markets price their produce more competitively, and to capture the value they have created for consumers.

In this study, we will focus on farmers' markets throughout the state of Florida. Farmers' markets in the state of Florida have been increasing in popularity since the 1980s and have continued to see an increase over the years. Typically, vendors at the markets sell produce that they have grown themselves. It is also common that some vendors purchase produce at a wholesale market and then sell directly to consumers at farmers' markets. Both of these types of vendors depend on these farmers' markets for income.

Farmers' market atmosphere varies throughout the state of Florida. Some markets are very entertaining, often with live music, face painting and activities that would attract families and people from within the community for the day. Other markets are simply there for the purpose of providing some sort of a storefront so that vendors may sell their produce. These markets would resemble a "no frills" atmosphere and are typically priced lower than the other markets with activities and nice storefront areas.

Both types of markets offer produce that is sold directly to consumers. For vendors who grow their own produce, there is no true middleman, but for vendors that purchase produce wholesale and then sell it at the farmers' markets, there is room for a middleman. In both cases, the vendor stands behind what they sell, as well as the quality of their produce. This sets up a nice transaction between the patron and the vendor because the patron can ask questions about the produce being sold. Even if the vendor is not necessarily the original grower of what they are selling, they still know the origin of the produce and the growing techniques of the items for sale. They can advise the patron as to whether or not the produce variety was grown by organic standards or if any pesticides or treatments were administered throughout the growing process. Typically, the produce found at markets was harvested within the past couple days. This ensures the freshness of the produce and ultimately, offers a better quality of produce than most grocery stores offer.

Although some vendors do not necessarily grow their own produce sold, they are in competition with surrounding grocery stores and supermarkets that sell produce. Depending on the location of the farmers' market that you visit, the produce is priced very differently than surrounding grocery stores. Throughout the northeastern United States, many farmers' markets create niche markets and offer specialty items and/or produce that consumers cannot find elsewhere. Because of the "value added" produce that you would find, it is also likely that consumers are willing to pay a premium at the farmers' markets for produce. However, at farmers' markets throughout the southeastern United States, it is typical to see most farmers' market produce priced

lower than surrounding grocery stores. Of course, there are exceptions to every rule, but this is the trend discovered throughout previous studies. (11)

Problem Statement

There are two main problems that exist within the farmers' markets throughout the state of Florida. The first is that many vendors at the markets do not have a schematic or methodological way of pricing their produce, therefore, limiting potential profit. The second problem is that farmers' markets are not promoted nearly enough to consumers, therefore, vendors lose out on potential gains of customers.

Produce consumers do not realize the cost savings and benefit ratio of purchasing produce at a market. Raising awareness of the lower prices at farmers' markets will not only support local farmers, it could ultimately incorporate more fruits and vegetables into the lives of consumers. The grocery store offers convenience and somewhat of a quality assurance, but farmers' markets provide less expensive produce and verbal quality assurance. You can always expect quality assurance at farmers' markets and you can rest assured that vendors will not sell something they do not stand behind. Farmers' markets "enable individual entrepreneurs and their families to contribute to the economic life of their local communities by providing goods and services that may not be readily available through formal mass markets. Thus, they embody what is unique and special about local communities and help to differentiate one community from another." (28) Now—more than ever—awareness of lower produce prices at markets is an immediate solution that will benefit the community, its consumers and more importantly, ensure that farmers will have a consumer base to purchase their product.

Support of local farmers at markets enables a prosperous and thriving agriculture future for those who are directly involved with the production, sales and packaging of produce. There are fewer middlemen and there is low overhead; the only thing that is missing from the equation is the profits vendors are missing out on from the production of local produce. Farmers' markets play a vital role in enabling farmers to gain direct access to customers. Without this access, the existence of many small- and medium-size growers would be threatened. (28) The data obtained from this study will provide farmers with valuable information that will help them better price their products and attract a broader consumer base with published results from the study.

Specific Problem

The main problem surrounding farmers' markets throughout the state of Florida is that they have no rubric or systematic way to price their produce. Some vendors simply look at the price of the produce that someone else is selling at the same market. In this study, approximately 80% of the vendors at farmers' markets were surveyed throughout Florida and reported that their prices *are* influenced by the current grocery stores price. This seems to be an appropriate percentage, however, only 40% of vendors consistently reported that they knew what the actual grocery store price was. (results found throughout this study) This would lead one to conclude that vendors take an approximation of what they think the price would be at grocery stores and then price their produce according to such. It is also worth noting that some grocery stores have certain types of produce on sale on a per week basis. If the vendors knew what types of produce were on sale at the grocery stores for that week and how much they were on sale for, they could place themselves to be better competitors against the grocery stores. The problem always arises in the case that grocery stores often purchase their

produce in bulk and can therefore demand a lower price paid to the source of the produce, i.e. the grower. Vendors at farmers' markets have fewer middlemen to deal with; they often produce the produce. This puts the grocery stores in a more competitive position if they can name their own price, whereas vendors must include overhead costs to be covered from the growing process--which are presumably more of an expense—although, both sources have overhead costs associated with production.

Another issue at hand is that a knowledge gap exists among the American public and the knowledge of existing farmers' markets; many don't realize that a market likely exists within their town or neighborhood. If the public realized that they could save money and that the markets are not far from them, they would probably be more inclined to patronize these farmers' markets.

Once a consumer attends the market, they experience the differences and the benefits of shopping at a farmers' market. Along with experiencing the ambiance of a farmers' market, they will also be able to chat with vendors about their products. Because of this individual attention and knowledge available to them, customers will likely return to the markets.

Objectives

The purpose of this project is to obtain price information among farmers' markets and grocery stores so it is possible to advise farmers that participate in markets to price their produce more competitively so that they may attract a broader customer base and ensure the prosperity of farmers and the markets they sell to. Objectives of this study include: collecting price data, summarizing and analyzing pertinent trends/relationships among vendor characteristics and pricing, as well as distributing valuable information to farmers that participate in the markets.

The two primary objectives include addressing the following questions: 1) How can vendors more competitively price their produce and to what extent should they increase or decrease their prices? 2) What factors influence produce price differences among farmers' markets and grocery stores? These objective statements raise questions that are necessary to be addressed in order to address the problem statement.

Objective 1

The main objective of this study is to create a way to advise vendors at farmers' markets on how to competitively price their produce. This corresponds with the purpose of the study, which is to provide concrete analysis with numbers to better advise farmers how to more competitively price their produce so that they may attract a broader consumer base. There is no systematic way of pricing that can be recognized as strategic among the farmers' markets; with this, it is necessary to provide a methodic way to competitively price produce.

To ensure sustainable agriculture, it is important to start at the bottom. If their product is priced competitively, they will receive a broader customer base and essentially make a profit if all goes accordingly.

Objective 2

The secondary objective of this study is to convey average grocery "basket" price differences to vendors. In order to bridge the knowledge gap, as well as convey how much profit vendors are potentially missing out on, it is important that average grocery "basket" price differences are computed and conveyed through a written report. If a vendor knows of the potential profit they are missing out on, they will be in a better position to approach pricing their produce more effectively. Potential profits that could

be made is essentially how much of a price difference there is between farmers' markets prices and grocery store prices, with the assumption that produce is less expensive at farmers' markets. On the other hand, taking on the assumption that grocery stores offer less expensive produce, vendors at farmers' markets will know how to adjust their prices more competitively in the same respect.

A "basket" of groceries consists of every type of produce that was used within the data analysis portion of the study. Each basket differs from one farmers' market to another; a specific "basket" of goods will not be defined, however, it is important to note that all items that are included within the "basket" are considered to be fresh produce. The "basket" of goods is used to resemble what an average customer might purchase as far as produce in a grocery basket at the supermarket or grocery store.

Research Plan

One of the goals of this study is to collect price analysis data among farmers' markets and grocery stores; the same types of produce will be analyzed based on a price relationship alone. Produce will be converted into a price/pound unit expressed in American dollars (\$). The results of this study will be examined on a per county basis to provide further recommendations on pricing and encouraging awareness for each market.

The second goal is to analyze and interpret data; once the price data and completed surveys have been obtained, further investigation among possible relationships between the two sources will be examined. Through this examination process, we hope to draw conclusions to better advise the vendors on how to more so competitively price their product(s).

The final goal of this study is to obtain information and produce articles conveying the results of this study. As a land grant university, the University of Florida holds a certain responsibility to the community to obtain and distribute valuable information to provide solutions for their everyday way of life. The community includes vendors at farmers' markets. By offering producers price information on price differences of produce, we are not only offering a start to help them to more competitively price their produce, we are also providing producers a way to make a higher profit in the long run.

Description of the Study Area

The study area is limited to farmers' markets that exist in the state of Florida. Markets that were visited are listed on florida-agriculture.com as a Florida Community Farmers' Market. Although the markets are listed on a Florida agriculture affiliated web site, it does not imply that a market is endorsed, approved or otherwise sanctioned by the Florida Department of Agriculture and Consumer Services.

Majority of the markets listed on florida-agriculture.com were visited on an individual basis. Some of the markets that were not visited were not in operation anymore. Surveys were administered in person and were partially conducted as an interview process to ensure the quality of the collected responses. A few of the surveys were presented in person and then completed and mailed back in a self-addressed stamped envelope. Prices were collected in person at each farmers' market, as well as in person at each grocery store.

By collecting the data in person, one at a time, it was also possible to obtain a better idea of the sources being investigated. Some farmers' markets were very similar to one another in each county; however, many markets differed from one another as the

county changed. As well as the atmosphere of the markets changing, the pricing at the markets differed and the price difference between the farmers' market and the surrounding grocery stores differed dramatically. It was more appropriate to divide the Florida farmers' markets into regions. By dividing these markets into five regions, a more appropriate pricing model could be devised. The regions are as follows: north central Florida, south Florida, central Florida, northeast Florida and the panhandle of Florida; the regions are labeled Region 1, Region 2, Region 3, Region 4 and Region 5, respectively.

Only vendors participating at the farmers' markets were interviewed. Although comments from surrounding consumers were noted, they were not taken into consideration for this study, as this study focuses primarily on the vendors of the farmers' markets. Once the vendors were interviewed, prices were collected on their produce. Prices were collected for every available type of produce that the vendor was selling at the farmers' market. Once all of these prices were collected, the closest surrounding grocery store was visited. While at the grocery store, if they offered the same variety of produce available at the farmers' market, the price was collected on each variety. Produce varieties available at farmers' markets, but not at grocery stores were not included in this price relationship analysis, and vice versa. Only varieties of produce that had an available counterpart at the surrounding grocery store were used, as it was necessary to obtain competing pricing information. If a second grocery store was in equal proximity in distance from the farmers' market, that grocery store was visited as well. The same price collecting procedure was once again administered.

Who Cares? – The Consumer Side of Farmers' Markets

Another emerging trend that has contributed to the developing popularity of farmers' markets is a group of consumers considered to be "locavores." A locavore is a person who consumes locally produced food. The importance of the concept, which identifies people who prefer to eat food originating within a 100 mile radius of where they live, was recognized when locavore was chosen as the Word of the Year by the New Oxford American Dictionary in 2007. Locavores benefit from the availability of fresher food, which often has superior taste, and reduced food transportation costs, while keeping the money they spend on food in their local communities. (12)

Farmers' markets are not only an outlet for vendors to sell produce—they are a part of a community. Many families look forward to visiting markets during peak growing seasons. The markets receive little to no advertisement on their behalf. For a country trying to incorporate five to six servings of fruits and vegetables into every American's diet, it seems as though promoting markets would be a logical route to venture down. Some farmers' markets even accept Electronic Banking Transfers (EBT) and food stamps.

A January 2009 study conducted by researchers of the USDA found that low-income households increased their purchases of fruits and vegetables when prices for these foods were lowered. The elasticity estimate for fruits used in the study is -0.52 and -0.69 for vegetables. Their findings included that if fruit and vegetable prices were reduced by 1%, the estimated demand for these products would increase by 0.52 and 0.69%, respectively. (10)

Do consumers shop at grocery stores for produce because of the convenience factor of purchasing all perishable items for your family in one place? Is a supermarket a

trustworthy source of security for produce; and if so, why? This study aims to provide somewhat of a structure and mechanical way for vendors at farmers' markets to price their produce, as well as deriving average price differences leading to savings that consumers will experience by shopping at farmers' markets, as opposed to grocery stores. Through these objectives, this study will contribute to the success and prosperity of farmer's markets throughout Florida.

It is essential that Americans incorporate fruits and vegetables into their daily diet. (29) "The proportion of lower income households' food spending that goes to fruits and vegetables (17.9%) is about the same as that of someone in a higher income tax bracket (17.5%)." (10) The actual dollar amount spent in that category—and thus the amount of the food consumed—is lower simply because less affluent people spend less on food overall. The USDA's Economic Research Service found that "there were major income-related differences in the consumption of lettuce and lettuce-based salads, melons, berries, and other fruit." They also reported that women in the highest income group were twice as likely as the women in the lower-income group to eat salad and fruit on a given day. The problem of providing enough fruits and vegetables across the country has always been and will always be an epidemic problem that needs to be approached in a serious manner.

Summary

The link between a consumer obtaining average cost savings through their grocery produce purchases and the process of encouraging contribution to farmers' markets is a gap that has not yet been fulfilled. Possible profit margin gains that are available to vendors at farmers' markets are an opportunity area that needs to be addressed through a schematic, mechanical process. Both existing problems with

farmers' markets are hidden opportunity areas that can easily be deciphered through the successful implementation of the primary objectives of this study.

Limitations of the study do not hinder the implementation of objectives, nor do they obstruct the overall quality of the data. The primary objective statements include: advising vendors at farmers' markets to more competitively price their produce and promoting average cost savings obtained by purchasing produce at a farmers' market. Both of these objectives will be addressed by collecting pertinent data and prices through an appropriate survey. The eminence of need regarding the issues at hand regarding farmers' markets are in full need of further research. This study will accomplish such.

CHAPTER 2 REVIEW OF THE LITERATURE

Overview

Markets—the Past and the Future

The documented growth in farmers' markets over the last decade—approximately 63%—is indicative that customers are benefiting as well as the vendors at the markets. (1) Thus, farmers have the potential for gaining a greater share of the consumer market. Presumably, local and regional economies benefit from an enhanced retention of local dollars. (20) Demand for alternative foods, such as organic and local products, is increasing dramatically in the US. Organic sales grew nine-fold between 1990 and 2001, while outlets for local food have risen sharply. (46) In 2002, there were 3,100 farmers' markets in the country, up from 1,755 in 1994 (Agricultural Marketing Service 2003). (46) Farmers' markets provide customers with direct access to fresh fruits and vegetables as well as a variety of value-added products. (32)

Throughout history, farmers markets have evolved from a roadside stand into a gathered, organized, and often taxed venue that has a frequent schedule of faithful patrons. The new farmers market offers a unique opportunity for a gain of market share and poses a serious threat to the current grocery fresh produce market. Vendors often offer seasonal, locally grown produce; in many situations, consumers will find unique items such as homemade jams or rare floriculture varieties. Depending on the season, it is quite common to find fresh produce that has been picked the day before or even that morning.

Since the height of the 1980s farm crisis, and intensifying with ongoing structural transformation of agriculture, many farmers have abandoned conventional farming as a

household livelihood strategy or have been expelled from it. (27) In response to the social and economic dislocations associated with agricultural and rural change, calls have resounded for more entrepreneurial approaches to the farm and rural economies, focused less on production and more on marketing. (30) Producers are exhorted to focus not on production quantity, but on product quality. In contrast to large commodity marketing, direct marketing of produce allows producers to learn the needs, interests and reactions of local people using their products.

Farmers markets have come a long way since their roadside stand days of old. With these new market-like practices, one would think that a pricing scheme was in place for these farmers to gain market share and concentrate on turning a profit for offering such high quality produce. Much to their demise, these farmers don't have the needs or materials available to devise such a pricing scheme. There is also little to no information available as far as pricing trends, market gains or elasticity demands per type of produce. Despite their popularity, in-depth research has yet to be conducted on farmers' markets. What has been done focused primarily on consumers to ensure that their needs were being met. Although customer satisfaction is important and helpful in structuring a market, two other parts of the equation are overlooked: the vendors and the organization of the market. (21) Sommer (42) reported that only 22% of the vendors at a Missouri farmers' market held attitudes that could be called positive or optimistic; 11% were clearly pessimistic about the future of the market or their continued presence there.

Defining a Farmers' Market

Defining what a farmers' market is has been one of the more difficult tasks of this project. Many roadside stands buy produce from wholesale distributors and are little

different in their operations and prices from local retail outlets. Commercial operators including supermarket chains are free to call themselves farmers' markets. In many municipal markets, growers sell their own produce adjacent to dealers who produce at the wholesale market. This ambiguity of the term, *farmers' market*, has made research regarding this difficult. For reasons regarding this research, the term "farmers' market" will be defined as a public place where those who grow food or purchase wholesale produce sell it directly to consumers.

Goodbye to the Middleman

Farmers' markets were once a popular means of purchasing fresh foods directly from the producers, but went into decline with the advent of the supermarket. (13) However, since the 1980s the numbers of farmers' markets in the U.S. has been steadily increasing. Marketing food directly from producers to consumers, so circumventing the 'middlemen' in the food supply chain, has many potential benefits. Among the many potential benefits lies an area for local vendors to gain a profit through obtaining more of a market share and for consumers to benefit from cost savings, as well as fresh produce. For consumers, direct marketing initiatives are providing people with locally grown, fresh and, in many cases, organic food at affordable prices. Producers benefit through retaining more of the value of their produce. (25)

In 1976, Congress passed the Farmer-to-Consumer Act to provide assistance to states in the area of direct marketing. Many states compile and distribute maps of farmers markets along with information about hours and days of operation, and also provide technical assistance through direct marketing specialists. Many areas addressing how to benefit the farmer have been of concern. This includes the concern about the food price spread, i.e. the difference between what the farmer receives and

what the customer pays; this is what the USDA (United States Department of Agriculture) refers to as an overall “food dollar.” Farmers’ markets, in turn, offer lower prices to the consumer and without the middleman, and ensure high returns to the producer. (41)

Benefits of Farmers’ Markets

In many situations, produce at farmers’ markets is less expensive than at surrounding grocery stores. “Cheaper produce of at least equal or better quality to supermarket produce is an additional benefit for consumers shopping at farmers’ markets.” (41) This is of particular importance for people with low incomes who cannot afford to purchase specialty produce for their families. Naturally, transporting food increases its cost to the consumer. It has been estimated that by 1970, assembly and distribution costs amount to 80% of the selling price of fruit and vegetables in the U.S. (37) Direct selling of produce from producers to consumers obviously cuts out many of these overhead costs that contribute to the 70% markup that is gained from buying from a third party or grocery store.

Farmers’ markets also offer consumers a unique shopping experience. Many markets even offer a nice atmosphere with live music, face painting and other sorts of entertainment in courtyard like settings. Shoppers can often taste or sample the product before they purchase it; shoppers can also barter or make a deal with vendors. Customers can also ask questions about the produce such as where it comes from and what pesticides are or are not added to the produce, restoring consumer confidence and product traceability.

Overall, farmers’ markets offer many benefits to both the consumer and the vendor. They also offer diversification in the marketing of their produce, which is used

as a 'survival strategy' for many farmers that have no other outlet to sell their product(s). For the rural community, direct marketing of rural produce ensures a greater percentage of its value remains within the local economy. (25)

Present Time—the Role of Farmers' Markets Within a Community

It is well known that people need a regular supply of fresh produce, as it contributes to a large portion of our daily food pyramid. (29) Such a supply is always available at the supermarkets, therefore, it is imperative that farmers' markets are scheduled regularly and follow practices of posting their hours and dates of operation with appropriate awareness. Markets should have a large range of stalls and/or "store fronts" to offer space for more vendors to participate. The more vendors per market, the more selection available to patrons and ultimately, the more patrons will attend.

Farmers' markets are offering customers improved access to fresh, healthy and often organic food at an affordable price. For customers who are concerned about issues such as human and environmental health, animal welfare and GM foods, farmers' markets offer produce that has generally been produced in an environmentally sensitive way with regard for animal welfare and human health. (25) This is a common attracting point to the consumer base that farmers' markets gain. Once at the market, and through chatting with patrons, it is easy to see that the motive of some customers goes beyond the average percent cost savings that they can obtain. Many families attend the markets on Saturday mornings, as well as elderly couples out enjoying the day. Farmers' markets have an eminent, positive presence within the community and deserve to be sheltered and promoted.

Consuming Local Produce

Local food systems are emerging as a viable alternative to the production and marketing models used in the industrialized global food system. In addition to reducing food miles, stimulating local economies and providing farmers with alternative markets, these locally based systems can also be a model for agriculture at the rural–urban interface. (36)

Today's farmers market often offers a nice, picturesque landscape as a backdrop; on a nice day, it is almost comparable to a hobby for many patrons. At many of the markets, consumers not only benefit from the local produce and the quality, but they can also exchange correspondence with the growers or vendors. Recipes and ideas are exchanged, as well as a history on a possible unique varietal that is offered from the vendor. People are becoming increasingly concerned about the quality and safety of the food they are consuming. (22) By offering the consumer a chance to make a personal connection with the grower or vendor, a sense of quality assurance is vested within the patron who may now purchase with confidence.

Farmers' markets are characterized by the selling of foods and other unique items to the consumer by the farmer who grew or produced the goods. As mentioned, this provides the link between the existing hesitations that patrons might have over a specific item. Because of the small scale of many of the producers selling at a farmers' market, food has often been produced using the minimum of chemical inputs. Consumers are becoming increasingly aware of the damaging impacts of pesticide use. In a study of consumer attitudes towards pesticide treatment histories of fresh produce, it was found that over 70% were either 'concerned' or 'very concerned' about pesticide residues. (5) By having access to the vendor, farmers' markets provide improved

access to fresh, healthy, often locally grown foods from sources that they know and trust. Ultimately, it is possible to increase accountability and build consumer confidence. Note that produce that is sold fresh does not require additives or preservatives as some might find in canned or commercially produced produce found at grocery stores.

Money Doesn't Talk, it Swears

The monetary transactions that take place at farmers' markets are the driving force of why the markets exist. They are an operation and act as a storefront for many vendors. The existence of these markets allows monetary transactions to occur and thus allows for a possible profit for the vendors. There are many other factors that come into question when addressing the process of the single transaction. There are costs of production, agreements, contracts and many other details that one would think would not matter by looking at the outside of a farmers' market, when in fact, they do.

Farmer Cooperatives and Coalitions

Explicit cooperation among sellers is a violation of most antitrust statutes, but countries often have an exemption allowing farmers to form coalitions to market their production. In the interest of most farmers, within the U.S., we have such an exemption; the Capper-Volstead Act of 1922 provides this exemption. Cooperatives collectively account for about 30% of farm product sales in the U.S. (16) One way in which farmer coalitions may inspire precompetitive market outcomes is through collective bargaining with for-profit processors. (11) Farmers' markets throughout the state of Florida do not utilize cooperative tactics and there is no formal price contracting in effect between vendors at the farmers' markets and local grocery stores.

A key source of leverage for farmers in collective bargaining is that they might integrate vertically into the processing and marketing of their production if they are unable to obtain a satisfactory agreement through bargaining. As far as cooperative tendencies taking effect within the realm of farmers' markets vendors, most vendors are essentially vertically integrated—with the exception of those who are third party vendors for other producers (i.e. they purchase the produce from a local wholesale distributor in bulk quantities and then take the produce to the farmers' markets to sell at certain mark up rate).

The talk of vendors that participate within farmers' markets forming some sort of a pricing coalition has been discussed. It seems to make sense in the first place: the vendors are essentially competitors among one another at that particular physical market. As a whole, they are all essentially competitors together to the grocery stores, just as the grocery stores pose some form of competition to all the vendors at the farmers' markets. Now, if the vendors were to join forces and form a pricing coalition among one another, no vendor would lose out; they would not be priced too high, nor too low among one another. By forming a supervisory committee who job is to observe local grocery store produce prices and then to report back to the pricing coalition of vendors, they could collaboratively price their produce uniformly among one another. Essentially, they would all benefit by gaining market share (customers) by pricing their produce lower than the grocery stores. Perhaps one vendor is afraid to price a little higher than the next guy, afraid that he will lose out on potential customers at that market. Price differentiation among the markets seems to be necessary, however, pricing is very unorganized at the markets.

Price Savings at Farmers' Markets

As mentioned in the *Price savings to consumers at farmers' markets* article: "In reviewing previous research on the topic, not a single study in a national journal could be located." Although this article was written in 1980, the amount of information available to the public about consumer price savings obtained by shopping at a farmers' market is far from prominent and accessible. The methods of some previous studies found were informal and it was difficult to know exactly what comparison procedures had been used. A brief review of the overall trends and results from the article will be discussed.

Food prices at eight farmers' markets in four southeastern states were 28% lower than the supermarket prices for the same items. A study of food fairs held in twenty-two Alabama and Tennessee towns show a 50% average savings on produce over retail costs. This shows to be consistent with the average cost savings data that was obtained during this study throughout the state of Florida; approximately 10 to 50% overall cost savings to the consumer was discovered.

Table 2-1, replicated from Sommer, et. al's 1980 study of price savings to consumers at farmers' markets (41) displays average unit prices at farmers' markets and supermarkets:

Table 2-1. Average Unit Prices at farmers' markets and supermarkets.

	Number of Items	Supermarket Average Unit Price (\$)	Farmers' Market Average Unit Price (\$)	<i>t</i> Ratio	<i>p</i>
Fruit	88	0.57	0.35	6.43	.001
Vegetables	215	0.32	0.20	7.07	.001
Other	55	1.61	1.21	1.94	.060
All Items	358	0.70	0.46	5.27	.001

And a distribution of percentage price savings obtained by shopping at a farmers' market. Each item purchased at the market served as a component of n . (41):

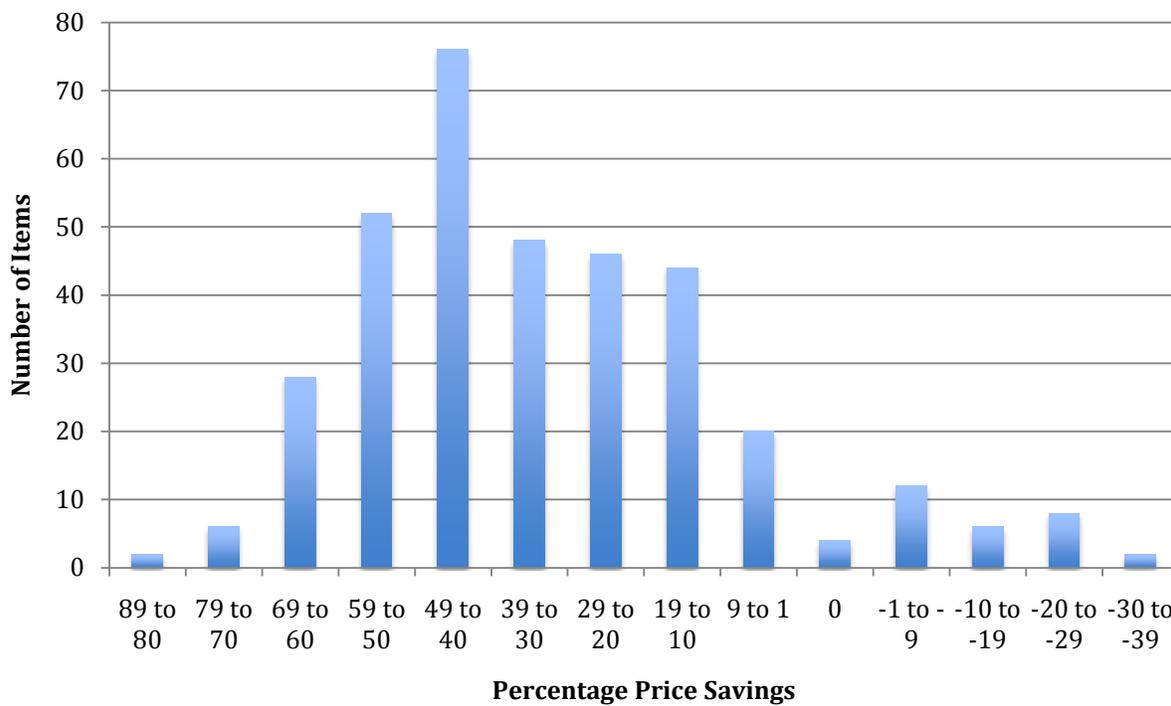


Figure 2-1. Percentage Price Savings Shopping at Farmers' Markets. The data shown above was reproduced from a similar chart derived in Sommer, et. al's 1980 study of Price Savings to Consumers at farmers' markets. The chart resembles data collected from 358 items at 15 farmers' markets.

The distribution of the percentage price savings on all 358 ($n=358$) identifiable items is shown in Figure 2.1 above. The modal price savings to the farmers' market consumer was in the 40-49% range and the median price savings was 39%. Additional analysis revealed that the grocery store price was higher than the farmers' market price 91% of the time, the average price charged by the farmers' market supplier was higher 8% of the time and the average price at the two sources was equal 1% of the time.

Seasonality and Savings

The farmers' market's greatest source of competition is the grocery store. Some are open at more convenient hours, 7 days a week. In addition to food and just about

any household item you could need, many are now offering many other services, such as a pharmacy. Studies show that most supermarket shoppers have favorable attitudes toward farmers' markets, even though they do not shop there. (21) "Even non-shoppers give produce purchased at farmers' markets higher ratings than supermarket produce for its freshness, quality, appearance and price. (6) And "it seems possible to infer that if various forms of direct markets and grocery stores were equally convenient and accessible, there is a general consumer inclination toward patronizing the direct market." (33)

Naturally, when an item is on sale at a grocery store, that item is not necessarily on sale at a farmers' market. This may be accountable for the approximate 8% that was recorded to have higher prices at the farmers' market than the grocery store. Also, many grocery stores buy in bulk so it's possible for them to negotiate a lower price with the supplier because they purchase such large amounts. It is also notable that naturally, fruits will be less expensive during the summer time and higher during the wintertime. Also, vegetables are less expensive during the winter months and more expensive during the summer when they are considered to be out of season.

Economic Impacts of Farmers' Markets

As mentioned, farmers' markets bypass the market middlemen and sell directly to customers. Direct marketing is important for these small-scale farmers and growers as they face low prices and wholesalers who prefer to deal with large volume producers. (11) Farmers' markets offer many benefits that come with direct marketing such as providing producers an opportunity to retain valuable returns associated with improved product quality. It has been estimated that producers have a 40-80% increase in return on their product sales using farmers' markets rather than traditional brokers. (26) This

case is especially true for Florida farmers' markets, as many consumers are out and about shopping at markets on Saturday mornings. This is made possible due to the nature of the weather throughout the state.

Various methodologies have been used to analyze the economic contribution of farmers' markets at local, state, and national levels. Most of the research has shown a significant economic impact as a result of farmers' market activities. (18) A study conducted by the Economics Institute in 1999 specifically asked consumers at Crescent City Farmers market in Louisiana what other businesses they visited and how much they spent there. The report estimates that consumers at the farmers' market generated over \$1 million annually in direct and indirect effects to vendors, downtown businesses and rural communities. Henneberry's 2009 study of the Economic Impacts of Oklahoma Farmers' Markets explained how farmers' markets were responsible for \$3,321,429 in direct gross sales, \$1,186,671 in indirect gross sales, and \$5,900,989 total gross sales in 2002.

Although income is small for small-scale growers at farmers' markets, most vendors do not primarily rely on sales for their livelihood. (15) Farmers' markets do offer the advantage of improved market information through direct contact with the consumer, as mentioned in the benefits of farmers' markets section. Farmers' markets "enable individual entrepreneurs and their families to contribute to the economic life of their local communities by providing goods and services that may not be readily available through formal mass markets. Thus, they embody what is unique and special about local communities and help to differentiate one community from another." (28) Now—more than ever—awareness of lower produce prices at markets is an immediate solution that

will benefit the community, its consumers and more importantly, ensure that farmers will have a consumer base to purchase their product.

Equally important as consumers' ability to question farmers at markets, farmers can question consumers. Farmers can learn about consumers' preferences and consequently adjust and add products that meet buyers' preferences. Without this direct access to consumers, many small growers would face the additional challenge of finding and developing an appropriate marketing outlet, which is something that most small growers simply do not have time for. (18) Insufficient volumes and stringent demands for product consistency make it difficult for small farmers to sell their goods through traditional marketing outlets. (35)

The Importance of Farmers' Markets

Referring to Table 2-2, it is easy to see that "part-time growers rely heavily on a farmers' market; for many it is their only outlet, and without it they would go out of business." Although some markets already have an established consumer base and a highly regarded reputation, most of the vendors that have provided feedback barely make enough of an income from markets to get by financially. This poses somewhat of a conflict in reasoning because, If the product is better and costs less (in most situations), why are these vendors not making a large profit? The only feasible reasoning is that there is simply not enough published awareness about the markets. By providing concrete numbers and statistics, it will be possible to provide reasoning to induce support to the local markets and such, ensure a prosperous future for the local farmers and agriculture within the community.

Table 2-2. Grower Dependence on Farmers' Markets.

	Full-time Growers	Part-time Growers	Non-Growers	Sig.'
Days at market (average)	18	19	13	p<.05
Vendors selling more than 30 days (%)	11	22	0	NS
Vendors selling at more than one market (%)	55	36	19	p<.05
Vendors who would be out of business or hurt considerably if their current market closed (%)	30	59	47	p<.10
Sales at various outlets as share of total (average, %)				
Farmers' market	35	68	59	p<.05
Road-side stand or pick-your-own	30	16	3	p<.05
Wholesale	19	4	7	p<.05
Craft shows	7	8	21	p<.05
Sales at farmers' market (% of vendors)				
>\$1000	83	55	48	
\$500 to \$1000	11	22	10	p<.05
<\$500	6	24	42	
<25% of total sales	63	27		
>25% of total sales	37	73	35, 65	p<.05

The type of grower (full-time, part-time, non-grower) indicated their response when asked the questions in Column 1. Sig.' represents the significance level of the data received. All data is significant at least at the 90 percentile level. This table is replicated from Lyson's 1995 study of Farmers' markets and the local community. (28)

The Quality of Produce at Farmers' Markets

When we interpret average cost savings or any type of relevant issue, it is logical to consider the quality of the produce being purchased. From the consumers' prospective, past studies show that farmers' market customers are primarily attracted by three factors: the overall quality of the products offered (freshness, taste, and food safety), the lower prices compared to those of comparable goods in supermarkets, and the market atmosphere. (18)(21)(23) Based on this preconceived notion that the quality of produce is superior at farmers' markets, 98.5% of respondents to a 1997 survey of New Jersey farmers market consumers indicated that they expected the quality of products sold at farmers' markets to be better than that sold at traditional outlets such

as grocery stores; a study of California markets showed that consumers perceived fresher-looking, fresher-tasting, and higher-quality produce at farmers' markets when compared to supermarket produce. (18) (17) (45)

The quality of food is a relevant issue in interpreting these price savings. If it is the case that consumers are paying less money at the farmers' market for food of inferior quality than is obtainable in the supermarkets, then if produce is a normal good, this scenario would make sense. However, based on past research, there is no evidence of this case. A half-dozen surveys in as many states of the union have shown that the primary reason why customers shop at farmers' markets is the food quality.

(2)(34)(39) Although most ratings would show true that supermarket or grocery store eye-appeal of produce seems to be better than that of farmers' markets, the quality of the produce such as taste and aroma tend to be rated better at farmers' markets.

(40)(38) Some studies showed that farmers' market produce offers to be no less quality than that of supermarkets, therefore, if a consumer is paying less at a farmers' market for equal or better quality produce, one is left with the conclusion that the farmers' market customers are paying less money for produce in terms of freshness and flavor, although perhaps not in appearance when compared to what is available at supermarkets.

Farmers' Markets and Sustainability

Considering that the main goal of sustainable agriculture refers to the ability of a farm to produce food indefinitely, there is no gray area when planning a course of action to pursue this. By supporting local farmers at markets, it is likely that a prosperous and thriving agriculture future for those who are directly involved with the production, sales and packaging of produce will be ensured. There are no middlemen and there is low

overhead; the only thing that is missing from the equation is the consumers to support the production of local produce.

The consumers that do not attend markets possibly fall victim to a knowledge gap. The knowledge gap theory is the proposed belief that the increase of information in society is not evenly acquired by every member of society: people with higher socioeconomic status tend to have better ability to acquire information. (44) Perhaps the information readily available regarding farmer's markets is not sufficient enough to overcome the knowledge gap that potential patrons endure.

Farmers' markets play a vital role in enabling farmers to gain direct access to customers. Without this access the existence of many small- and medium-size growers would be threatened. The data obtained from this study will provide farmers with valuable information that will help them better price their products and attract a broader consumer base with published results from the study. Further advising and recommendations will be made per county for the vendors that participate in the markets.

Theoretical Framework

Price Determination

Let price, in regards to this study, be defined as the measure of value for a unit of a commodity or service that expresses its worth relative to other goods or services. Farmers' markets operate in an *imperfect competition* scenario. The imperfect competition scenario is most suitable for farmers' markets because there are always barriers to contestability of the market and the products sold are far from being homogeneous, most farmers' markets are full of heterogeneous products due to product differentiations. It is logical to assume that in the real world there are negative and

positive externalities from both production and consumption. Farmers' markets resemble some aspects of perfect competition as well; there are many small firms, many individual buyers, there is perfect freedom of entry and exit from the industry, and the vendors are price takers. With this taken into consideration, perhaps the only reason farmers' markets are not truly in perfect competition is because perfect or pure competition is very hard to obtain. For this framework, we will assume that vendors at farmers' markets set their prices relative to the local vendor competition within the same market. With this assumption, and because farmers' market pricing operates like that such of a perfect competition market, we will use the perfect competition price determination framework.

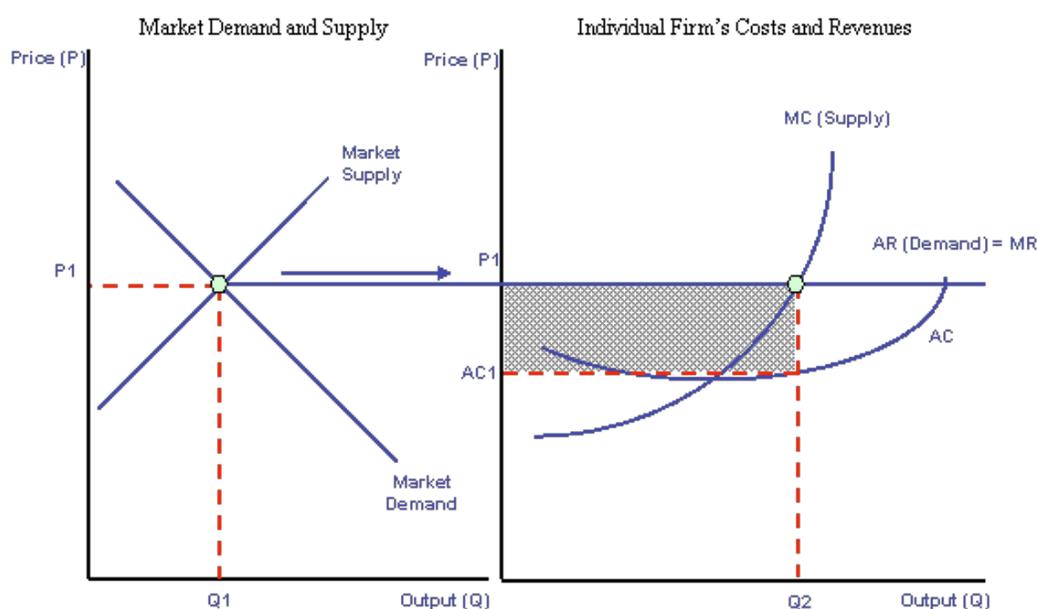


Figure 2-2. Establishing price and output in the short run under perfect competition. The forces of market demand and supply determine the equilibrium price for the industry. The market price $P1$ is established and output $Q1$ is produced. This $P1$ price is taken by each of the firms. (Source: <http://tutor2u.net/economics/revision-notes/a2-micro-perfect-competition.html>, last accessed: February 2010)

Factors of Production

In economic theory, factors of production are resources used and employed to produce a good or a service. They exist within the production process but are not apart of the final product, or they are transformed during the production process. For this study, the factors of production include: land, labor and capital goods.

Farmers' markets employ the use of *land* in production is a literal interpretation, as most of the vendors do actually employ the land they own or rent to produce the products sold. As for the vendors that purchase produce at a wholesale market and do not own or use land in the production process, we can interpret the amount paid for the produce at the wholesale price included some sort of a *rent* payment to wholesale distributor of the produce. This rent payment is essentially counted as the *land* usage as a factor of production for this type of vendor.

The *labor* factor of production is not necessarily the same for every vendor at the market. Some vendors grow their own produce, harvest it and sell it all by themselves; these vendors would be considered to be fully vertically integrated. Other vendors employ different amounts of actual labor. Some may hire a crew to plant or harvest the produce, while other vendors may hire workers to help them sell their products at the farmers' markets. All cases were observed at the farmers' markets. For vendors who purchase wholesale produce and then sell it at the farmers' market, the main labor aspect that relates to them is their labor put in at the farmers' market while they sell the produce; they were not involved in the growing or harvesting process of the produce.

All capita/ stock for each vendor at the markets differs as well. For those vendors that are completely vertically integrated, they own and/or rent all of their capital used for production, including but not limited to: machinery, tractors, harvesting tools and storage

silos or housing. For the vendors that purchase the produce through wholesale, the capital they must include as a factor of production is simply the vehicle used to transport the produce from the wholesale lot to the farmers' market. Both types of vendors include supplies such as: price tags, cash registers, receipt paper, etc. in their capital stock investment as a factor of production.

It is noted that because of the large amount of difference in the factors of production among the different types of vendors, it is impossible to group farmers' markets as being in perfect competition market. This is supportive of the previously mentioned justification of markets existing in a mixture of perfect and imperfect competition.

Static Models of Food Markets Under Imperfect Competition

Some of the products sold at the farmers' markets are considered a factor of production for a homogenous or final product. Most formal models of food marketing make the assumption that all marketing functions are performed by an integrated marketing or processing sector that buys raw product from farmers, and then converts it into a final product. The static models of marketing firm behavior in agriculture explained can be separated according to the assumptions made regarding the role played by the farm product in producing the finished consumer product. (16)

When the type of produce purchased at the farmers' market is used as an ordinary input in variable proportions throughout the production process to produce a homogenous product, Gardner (1975) framework is appropriate to be extended to an imperfectly competitive industry. At farmers' markets, it is possible to have differentiated products, due to some sellers being able to produce niche goods or different varieties of the types of specialty produce. When this product differentiation is important, it is

necessary to estimate demand and/or supply functions that these vendors with differentiated products face. An individual firm's demand function can be written as:

$$q_i = D_i(p_1, \dots, p_n, N) \text{ with } i = 1, \dots, n,$$

where p_1, \dots, p_n denote prices charged by each firm and N denotes exogenous demand shifters, assumed to be common across the n firms. It is possible to analyze the demand system in the above equation by deriving an expression for residual demand. Baker and Bresnahan developed this methodology in 1985. The study suggested that residual demand is the demand facing a firm expressed as a function of the price charged by the firm after taking into account rival firms' behavior at each price level. This would exist in farmers' markets with more than one vendor, as the vendors sometimes model their prices by the amount that another vendor, who is essentially a competitor, is charging.

Let's consider the industry of farmers' markets to have n firms. An individual firm within a farmers' market's demand function can then be written as:

$$q_i = D_i(p_1, \dots, p_n, N), \text{ where } i = 1, \dots, n,$$

where p_1, \dots, p_n denote prices charged by each firm and N denotes exogenous demand shifters, assumed to be common across the n firms. To start to derive an expression for the residual demand of a firm (denoted as "firm 1"), we use the first-order conditions (FOC) for profit maximization of all the other firms (denoted as "firm 2"), n (to include all firms, n), to express their supply behavior as:

$$\frac{p_i - c_i(q_i, v_i)}{p_i} = - \left(n_{ii} + \sum_{j=2}^n n_{ij\phi j} \right), \text{ where } i = 2, \dots, n,$$

where n_{ii} is the partial own-price elasticity of demand facing firm i , and $n_{ij} = (\delta q_i / \delta p_j)(p_j / q_i)$ are the cross-price elasticities. The $\phi_{ji} = (\delta p_j / \delta p_i)(p_i / p_j)$ are conjectural elasticities expressed in price terms. Next, we use both of the stated equations to attempt to solve for the equilibrium behavior of firms $2, \dots, n$, thus obtaining the following expressions:

$$p_i = p_i^*(p_1, N, V; \phi), \text{ where } i = 2, \dots, n,$$

where V denotes the union of the v_i and ϕ is the union of the ϕ_{ji} . We finally obtain the residual demand, R_1 , for firm 1 by substituting the p_i^* into D_1 from the first stated equation. The expression resulting from this substitution is:

$$q_1 = R_1(p_1, N, V; \phi),$$

This equation contains: firm 1's price, the vector N of demand shifters, and the vector V of exogenous determinants of the rival firms' supply behavior. This residual demand approach can indicate whether a firm has the potential to exercise market power, and it particularly useful when evaluating the impact of structural changes such as entry or exit. Thus, we can define residual supply as the supply facing the purchaser of an input after taking into account the input demand relationships of all competing buyers. In this case, the purchaser can be defined as someone who would purchase items from a farmers' market to include as an input in a product they are producing to sell.

Price Savings Model Related to Farmers' Market Consumers

Previous studies have shown that price savings to consumers exist when a consumer shops at a farmers' market for produce as opposed to a grocery store. Throughout Sommer, et. al's 1980 study of Price Savings to Consumers at Farmers'

Markets, the following equation was implemented when determining percentage price savings:

$$\text{Percent price savings} = \frac{\text{Average SM price} - \text{Average FM price}}{\text{Larger price}} \times 100$$

where SM price is equal to the average price charged for an identifiable item at supermarkets in a particular city, and FM price is equal to the average price charged by sellers for an identifiable item at the farmers' market in the same city. (41)

The same percent price savings model will be employed when determining price savings throughout this study, with the only exception being that the denominator will be substituted to include the average FM price, not the larger price of the two. A simple model such as the one above is all that is necessary to convey appropriate price savings at farmers' markets, as the percent price savings will be negative if the average farmers' market price is higher than the average supermarket price, and vice versa.

Summary

Although some information is available regarding the price savings at farmers' markets, the articles seem to be a bit dated. Also, no data is specific to the state of Florida. This review of the literature is a significant source of background information of farmers' markets throughout the U.S., as well as providing a legitimate reason as to why this research was deemed necessary and will hopefully be a significant impact on farmers' markets.

A lot of past research was available regarding willingness to pay, consumer trends and preferences and viewpoints from the consumer. This information was not cited significantly because we have chosen to focus on the farmers' market vendor aspect of pricing strategically, as opposed to offering them information regarding

consumer preferences. By addressing our second objective of conveying average cost savings to the consumer, all sectors of the farmers' markets are successfully addressed.

CHAPTER 3 SURVEY METHODS AND SUMMARY DATA

Introduction

This study serves to ultimately provide a resource for vendors at farmers' markets to more competitively price their produce that is sold at such markets. The research and methodology has the underlying motive of promoting general awareness of the existence of farmers' markets and the price differences available to consumers that pay patronage to the markets. This study also seeks to provide concrete numbers that is transposed into average percent cost savings, which is essentially potential lost profit at each market. The derived average price differences obtained between the two sources is how much more a vendor at a farmers' market could be charging for their produce, therefore, this will be conveyed as lost profit margins. Ultimately, the prosperity of farmers' markets throughout the state of Florida is a key goal of the study.

The two objectives were carried out in order to fulfill the purposes of this study:

1. Advise vendors of farmers' markets to more competitively price their produce.
2. Derive how much profit margin farmers' markets vendors at farmers' markets are losing out on. Also, convey average percent price differences to consumers of produce throughout the state of Florida, ultimately aiming to incorporate more fresh produce into the lives of residents as well as promoting awareness of farmers' markets.

The focal points of this chapter aim to describe the survey design and implementation used to pursue the study objectives. The population is also discussed with terms of obtaining a large sample size, so that it is considered to be normal. The procedures of survey implementation are discussed, as well as discussion regarding the various data analysis techniques that were utilized to provide the proper regression analysis framework for the two main objectives.

Research and Survey Design

The research design is based on a survey that is implemented in person, in a one-on-one interview. The types of research collected include both qualitative and quantitative data. Both types of data will be used to determine the appropriate regression equations to satisfy the two objective statements.

The survey administered includes questions such as likert-scale, open ended, one option and check all that apply. The survey was designed to be administered to vendors at farmers' markets throughout the state of Florida. Once the survey was completed, the researchers obtained the pricing information available on all produce items that the vendor had for sale. If the vendor was unable to answer questions at that point in time, the survey was designed so that it could be left with the vendor and completed at their earliest convenience and then mailed back to the researcher in the included self-addressed stamped envelope. Although this option was available, it was preferred that the survey be taken in person to ensure the accuracy and completeness of the responses.

Surveying Instrument

The instrument (see *Appendix A, B, C, and D*) used to collect responses was a four-page survey designed to obtain all information necessary to contribute towards fulfilling the objective statements of the study. Before the surveying process began, the participant was informed of their anonymity rights and that the survey was IRB approved by the University of Florida. Once the participant understood this, an IRB consent form was signed for each survey collected.

In order to collect price analysis data among farmers' markets and grocery stores, a survey has been devised that will not only collect prices but will also collect

feedback from the vendors participating in the markets. In a 2007 Stern and Dillman study, it was found that the results from their seven experiments provided substantial evidence that the visual design of questions (graphical and verbal manipulations) in self-administered surveys affected respondents' behavior, regardless of age, educational attainment, and sex. (43) Therefore, the design and visual appeal of the survey were held to high standards and pilot testing of the survey was administered. The survey was well received and, therefore, further implemented. By collecting prices and feedback, we can further identify and investigate relationships among the two sources.

The first part of the survey began by stating the following information to give the participant a little bit of background information as to why the study was taking place:

Farmers markets across the state of Florida have been increasing in popularity over the past two years. Very little information is available regarding the price relationship between farmers markets and nearby grocery stores. Further investigation of this relationship is necessary and could yield vital information to support further understanding of pricing trends among these two sources.

The survey continued to ask questions about the vendor's involvement in farmers' markets from a production aspect. The questions in this section included: whether they participate in farmers' markets or not (they were advised to turn in the survey if the recorded answer was "no" to this question), how many years they have participated, and what the total acreage used in their operation is and how much is rented or owned. The next area of interest the survey focused on was how many years the vendor had been offering the product or service at a farmers' market, and the percent total of annual gross sales for the operation, as indicated by the appropriate product or service.

Previous literature has suggested that organic produce has been increasing in popularity over the years. This led to the curiosity of whether or not the vendors participate in organic production strategies. The vendor was asked to indicate if they had practiced the following strategies and if so, for how many years: certified organic production, following organic regulations but not certified, follow organic principles but with some conventional inputs, and/or conventional production. There was also an area for a fill in the blank type of production.

The next section of the survey was geared towards better understanding the vendor's opinions and attitudes towards farmers' markets. Questions started with asking about the current customer base at the farmers' markets. Did they believe that there had been an increase in the customer base; did local produce offerings contribute to a broader customer base for farmers' markets; and what types of benefits did they believe farmers' markets offered.

To better understand pricing trends at the farmers' markets, interactions with grocery stores were of interest. The next questions asked throughout the survey included: are your prices influenced by local grocery stores' pricing, do you know the current grocery store price today for the items that you are selling, do you believe that your prices are typically less expensive or more expensive than what a customer would find in a grocery store in the surrounding area, do you have any sort of an informal/formal contract or agreement with grocery stores, do growing seasons have an impact on the availability and pricing of your products, and how do you think your customers perceive your prices in comparison to grocery store prices. Each of these

respect, we will publish articles and work with IFAS to draw awareness to the farmers' markets from the public and concentrate on conveying price differences by shopping for produce locally at a market.

The purpose of collecting, analyzing and distributing the information found is primarily to help the vendors that depend so heavily on these farmers' markets for their main source of income. With advisement and proper evaluation of their current inventory prices, they can better position themselves to be more competitive and ensure a thriving future for themselves and the farmers' markets as a whole.

Methodology

In order to collect price analysis data among farmers' markets and grocery stores, a survey has been devised a survey that will not only collect prices but will also collect feedback from the vendors participating in the markets. By collecting prices and feedback, we can further identify and investigate relationships among the two sources.

Once the data was collected, both qualitative and quantitative, the data was processed through the proper data analysis mechanics and a report of findings were drawn up. A findings report has been composed so that information can distributed to farmers' market vendors and small or part time farmers throughout the state of Florida. Recommendations and strategy implementation will also be distributed to the vendors to help them more competitively price their items so that they may attract a broader customer base and maintain the current base of consumers that visit them regularly.

As mentioned, all findings will be distributed throughout the state of Florida to allow vendors to properly utilize the findings and conclusions between pricing of the two sources that we have investigated. The purpose of collecting, analyzing and distributing the information found is primarily to help the vendors that depend so heavily on these

farmers' markets for their main source of income. With advisement and proper evaluation of their current inventory prices, they can better position themselves to be more competitive and ensure a thriving future for themselves and the farmers' markets as a whole.

Statistical Analysis Software (SAS) for Windows was used to analyze the qualitative questionnaire data. Microsoft Excel was used to compose graphs, bar charts and pie charts.

Population and Sample

Entry into and out of the farmers' markets is easy; therefore, obtaining an exact population size is nearly impossible as it changes on a weekly basis. In statistics for a large, normally distributed population, n must equal at least thirty observations. (14) The surveying process in this study was enjoyable, but took a while, and travelling throughout the state of Florida was necessary. This restriction made the process of obtaining completed surveys difficult.

The sample used for this study included fifty-two completed surveys. Within this sample, there are both vendors who grow their own produce and vendors who purchase produce from a wholesale producer. The true sample size is unknown, as the same vendors do not always participate in the same markets consistently and new vendors are added weekly. Fifty-two separate vendors were identified and completed the surveying process. Approximately sixty-five grocery stores were visited in the respective areas surrounding the farmers' markets.

Data Analysis

In order to analyze the data in the most appropriate manner, the researcher utilized Statistical Analysis Software (SAS) for Windows. To analyze the qualitative

data, descriptive statistics were performed on each variable. Frequencies (f) and proportion percentages (p) were the most appropriate measures for analyzing the qualitative data.

The analysis of the quantitative data was much more labor intensive. An OLS (ordinary least squares) regression models was obtained to satisfy one of the objectives of deriving a pricing strategy. To determine whether to reject or fail to reject the null hypotheses associated with the two tests, an F-test was conducted for both situations. The F-test is appropriate because it is used when comparing statistical models that have been fit to a data set to determine which model that best fits the population from which the data was collected. Further, the ANOVA tables gave a better representation of the relationship between the independent variables and dependent variable. The qualitative data collected that was used in the regression models was converted into dummy variables so that they may be properly analyzed. The variables of interest that were used throughout the analysis process will further be defined in the following chapter.

Survey Responses

The surveys were administered in an interview like style; either the author or a researcher assisting with the data collection process then recorded the participant's responses. Some of the surveys were completed at the participant's leisure, as some were left with the participant so that he or she may fill it out at their earliest convenience. Regardless of the way the data was collected, the integrity behind each set of data recorded was secured.

A lot of the results to be explained in this section don't provide much room for discussion, as the data itself is pretty straightforward and self-explanatory. Some

comments will be made, but the purpose of this chapter is to state the results of the data collection. The question stated on the survey will be defined and then a breakdown of the responses will follow.

Farmers’ Market Participation and Acreage Characteristics

The participants were first asked if they participated in farmers’ markets. If their response was “No” then they were asked to return the survey. From this, we can conclude that 100% ($n=52$) of the vendors interviewed do participate in farmers’ markets. They were then asked to tell us about the land used in their operation that contributes to the production of what they sell at the farmers’ market. How they responded is shown in Table 3-1:

Table 3-1. Averages of years farmers’ market participation and land usage.

Description	Average	Std. Dev	Median
Years of Participation	15.80	15.45	9.5
Total Acres in Operation	39.91	92.77	6
Total Acres Used for Production	32.25	78.18	6
% Land Owned	65.95%		
% Land Rented	10.64%		

Type of Product and Percent of Total Annual Gross Sales per Operation

The participants were then asked to describe how many years they have been offering a product or service at a farmers’ market. They were then asked to indicate the percent of total annual gross sales that the item contributed to the operation. If the vendor indicated that they offered that particular type of product or service, they are considered to count as “1.” Then, they indicated what percentage that product contributes to annual gross sales. Table 3-2 indicates how they responded:

Table 3-2. Product or Service Contribution to Annual Gross Sales.

Product or Service	Vendor Counts	Average Percentages
Culinary or Medicinal	10	22.30%
Cut Flowers	3	11.67%
Flowers and Bedding	5	17.40%
Fruits, Citrus	12	45.00%
Fruits, Deciduous	19	25.05%
Fruits, Other	11	26.18%
Fruits, Small	20	23.75%
Vegetables, Field	33	40.09%
Vegetables, Greenhouse	6	28.00%
Woody Landscape Plants	1	5.00%

The most common product that contributes to annual gross sales is field vegetables; field vegetables also contribute to approximately 40.09% of overall gross annual sales, on average. The least common product that contributes to annual gross sales is woody landscape plants, contributing only 5.00% of overall gross annual sales, on average.

Organic Practices and Regulations

Organic produce is recently becoming a popular a source of many discussions at farmers' markets. Because of this emerging trend, it seemed appropriate to investigate how many vendors follow organic practices and how many are certified organic growers. Table 3-3 indicates how vendors responded when asked how many years they had practiced any of the following production strategies.

Table 3-3. Vendors Participating in Types of Organic Production.

Type of Organic Production	Vendors Participating in Type of Organic Production	Average Years of Participation
Certified Organic	3	1.33
Follow Organic Regulations	18	4.06
Follow Organic Principles	9	12.11
Follow Conventional Organic Production	12	10.08

The most popular type of organic production that vendors participate in is through following organic regulations; approximately 34.62% ($n=18$) of vendors practice following organic regulations.

Attitudes Towards Consumer Base and Customer Perceptions

Even though only the vendors were selected as the sample to interview, an interest of how vendors perceived their consumer base was still of interest for advising recommendations to follow. When asked if they had noticed an overall increase of a customer base for farmers' markets, the vendors responded in the following way, shown in Table 3-4:

Table 3-4. Customer Base Increase/Trends.

Response	Frequency/Count	Percentage
Yes	29	55.76%
No	15	28.84%
No Response	8	15.38%

Of the twenty-nine vendors that responded "Yes" to the previous question, they were then asked if they believed the increase is influenced by current grocery store prices. Table 3-5 indicates how the twenty-nine vendors responded.

Table 3-5. Grocery Store Influence on Customer Base

Response	Frequency/Count	Percentage
Yes, Influences	24	82.75%
No, does not influence	5	17.25%

As shown above, approximately 83% of the vendors believed that the current increase in a customer base to farmers' markets was influenced by current grocery store prices.

Contracts and Seasonal Effects of Farmers' Markets

Vendors were then asked if their prices were influenced by current grocery store prices. Eighty-percent ($n=42$) of vendors responded that their prices were influenced by

grocery store prices; 20% ($n=10$) of vendors indicated that their prices were not influenced by grocery store prices and indicated that their prices are affected primarily by overhead costs. Of the 80% ($n=42$) that responded that their prices were influenced by grocery store prices, only 41% ($n=20$) indicated that they knew what the current grocery store prices were currently for the items they were selling. There seems to be some sort of a gray area here; how do vendors price their produce according to grocery store prices if they do not know the current grocery store prices? A knowledge gap exists here and Objective 1 addresses the issue of pricing produce appropriately.

Next, vendors were asked if they thought that their items sold were typically less expensive or more expensive than what a customer would pay at a grocery store. All of the vendors ($n=52$) indicated that they thought their produce was priced less expensive than what a customer would pay at a grocery store. Although this is what the vendors believed, some of their items were priced higher than the current grocery store price. Not very many were more expensive, but the pricing model will also help vendors to not overprice their produce.

Some vendors' prices were influenced by grocery stores; therefore, it seemed appropriate to ask if they had some sort of an informal/formal contract or agreement with grocery stores as to how they go about pricing their items. All of the vendors ($n=52$) indicated that they did not have any form of informal/formal contract or agreement with grocery stores as far as pricing is concerned. Some mentioned that they sold some of their produce to grocery stores, but none exhibited a contract of any sort for pricing.

When asked if growing seasons had an impact on the availability and pricing of their products, 98% ($n=51$) indicated that growing seasons affected both availability and pricing. Only one vendor (2%) indicated that what they offered at farmers' markets was not affected by growing seasons.

Vendors were then asked if they thought their customers perceived their prices in comparison to grocery store prices in a positive or negative way. Table 3-6 indicates if the vendor responded with "positive," "negative," or "both."

Table 3-6. Customer Perception Towards Farmers' Market Prices.

Response	Frequency/Count	Percentage
Positive	39	90.69%
Negative	0	0.00%
Both	4	9.31%

As demonstrated above, an overwhelming amount of vendors agreed that they thought their customer base had a positive perception towards their prices as compared to grocery store prices. Many vendors explained that customers had often offered feedback stating that they "get more for their money," "get better quality for a lower price," and that they "always know it will be a good product." [when referring to farmers' markets, as opposed to grocery stores]

Demographics and Characteristics of Vendors

When interviewing the vendors, we were interested in whether or not they actually shop at grocery stores for items. Approximately 90.69% ($n=39$) responded that they do purchase items at the grocery store and 9.31% ($n=4$) indicated that they do not purchase items from the grocery store, indicating that they primarily grow everything they consume. Next, they were asked if the majority of the produce your family

consumes comes from what they grow or if it is purchased at a grocery store. Figure 3-2 indicates how many vendors grow or purchase their household produce:

Grow or Purchase Household Produce

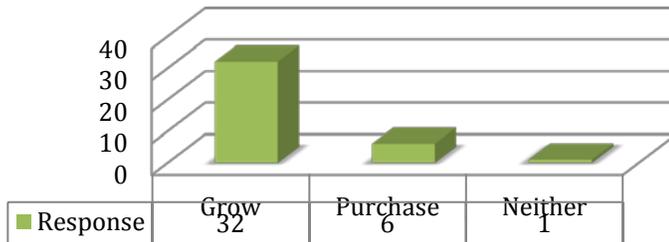


Figure 3-2. Proportion of Vendors who Grow or Purchase Their Own Produce.

Thirty-two responded that they grow their own produce; six responded that they purchase majority of it and one indicated that they do neither of the two responses.

Next, vendors were asked to correctly respond with their age. One vendor was between 0-25 years of age; five vendors were between 26-36; six vendors were between 37-47; nineteen were between 48-58; seven were between 59-69; and five were ages 70 and up. Figure 3-3 represents the vendors' ages:

Age of Vendors

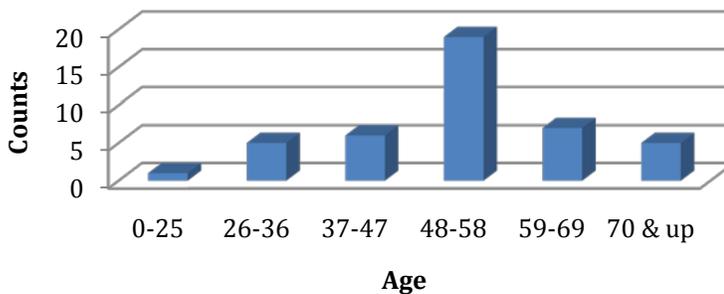


Figure 3-3. Vendor Age Brackets.

Vendors were then asked if they considered themselves to be a full-time farmer or a part-time farmer. Full-time farmer indicates that 50% or more of their annual gross income comes from farming produce and/or selling produce at farmers' markets.

Approximately 60% ($n=15$) indicated that they were full-time farmers and 40% ($n=10$) indicated that they were part-time farmers.

The final question of the survey recorded vendors' ethnicity. Thirty responded as Caucasian; three are Hispanic; eight are African-American; none were Native American and two responded as "Other" for ethnicity. Figure 3-4 represents the proportion of ethnicities of vendors.

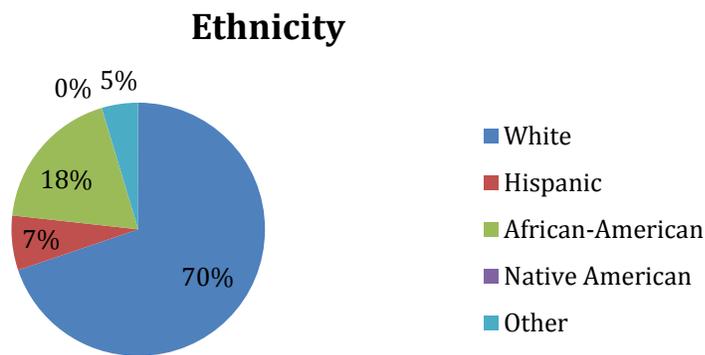


Figure 3-4. Vendor Ethnicity

Summary

The design and implementation of the data collection instrument was decided to be most appropriate and suitable to further approach completing the objectives of the study. The instrument used for data collection is a four-page survey with both qualitative and quantitative response questions. The surveys were administered in a one-on-one, interview-like basis. Once the survey was completed, prices of the produce sold at the farmers' markets and grocery stores were recorded.

The data was further analyzed using SAS. Regression equations were derived and descriptive statistics were performed on the responses from the four-page survey administered. The application of this material to the objectives was also be discussed.

As mentioned, the sample from which data was collected consisted of vendors of farmers' markets.

The results section explained all of the qualitative responses received from the surveys. All of the vendors participated in farmers' markets and the most common type of product sold at the markets is field vegetables. All of the vendors indicated that they believed their produce was priced lower than grocery stores and approximately 91% of vendors indicated that they believed customers perceived their prices positively when compared to grocery stores. Approximately 80% of vendors indicated that their prices are influenced by grocery store prices, but of that 80%, only 40% knew the current grocery store prices.

Majority of the vendors were of Caucasian ethnicity and were 48-58 years of age. Thirty-two vendors indicated that they grow the produce consumed in their household, while 60% considered themselves to be full-time farmers. The next chapter will discuss the implications and application of these results.

CHAPTER 4 PROPOSITIONS

Hypothesis Testing

In this chapter, the hypotheses and the statistical analysis output will be discussed. The derived model will be implemented to fulfill the proposed primary objectives and the model will be used to predict relationships between the independent variables and dependent variable. The propositions stated in this chapter will correspond to the pertinent objective statements and will be justified and provide evidence that supports the hypotheses statements.

Stating the Hypotheses

The hypotheses were derived to address the questions that would ultimately lead to a result to test the objective statements. What factors influence produce price differences that will lead to price differences among farmers' markets and grocery stores? How should vendors at the markets competitively price their produce?

In order for an overall average price differences to reflect in a manner that is beneficial for farmers' market, the value of the price differences must be a positive integer. In order to test this and conclude whether or not price differences are actually achieved by purchasing produce at a farmers' market as opposed to a grocery store, it was appropriate to test the price difference of the produce between the markets and the grocery stores, and the full-time status of the vendor at the pertinent farmers' market. For this study, a vendor was either characterized as being a full-time grower/vendor at farmers' markets or a part-time grower/vendor or hobby farmer at the markets. To test the hypothesis: price difference and vendor full-time status influence overall average

percent price savings at farmers' markets, the following null and alternative hypotheses were derived:

$$H_0 : \beta_n = 0$$

$$H_a : \beta_n \neq 0$$

Where β_n is defined as containing the two variables: the price difference between the two sources of produces and the full-time status of the vendor. Let H_0 represent that the two factors, price difference and full-time status, have no effect on the overall average price savings obtained at farmers' markets. Let H_a represent that the two factors, price difference and full-time status, do have an effect on the overall average price savings obtained at farmers' markets. The following supporting hypotheses further describe the purpose of the above stated hypothesis:

- Produce prices are lower at farmers' markets when compared to grocery store prices for the same "basket" of produce.
- The price difference between the selected item of produce at a farmers' market and its average price at the surrounding grocery stores influences the consumers' overall average percent price difference, possibly leading to price savings.
- Whether the vendor is full-time or part-time influences how vendors price their produce and, therefore, influences overall average percent price differences.

What factors influence produce price differences that will lead to price savings among farmers' markets and grocery stores? How should vendors at the markets competitively price their produce? The next hypotheses derived were aimed to answer these questions and to determine if the following factors affect the price of produce at a farmers' market: average grocery store price, whether or not the farmers' market vendor's prices are influenced by current grocery store prices, whether the vendor is considered to be full-time or part-time, the total acres used throughout their operation,

how many years they have participated in farmers' markets, their age, and dummy variables for the defined regions throughout Florida:

$$H_0 : \beta_n = 0$$

$$H_a : \beta_n \neq 0$$

Where β_n is described as containing all of the predictor/independent variables stated above. Let H_0 represent that all of the predictor variables have no effect on the price of produce at farmers' markets. Let H_a represent that all of the predictor variables *do* have an effect on the price of produce at farmers' markets. Combining all of the predictor variables and the dependent variable, *FMPPrice*, into a regression equation produces the following model:

$$Y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_6 + \beta_7x_7 + \beta_8x_8 + \beta_9x_9 + \beta_{10}x_{10} + \varepsilon$$

The following supporting hypotheses further describe the purpose of the above stated hypothesis:

- Most farmers have no systematic way of pricing their produce.
- Grocery store prices should influence farmers' market pricing and potential savings are derived from the farmers' market price and grocery store price difference.
- Full-time status of the vendor influences the farmers' market price.
- Total acres used throughout the operation, years of participation at farmers' markets and age of the vendor influence the skill and pricing trends used at farmers' markets, therefore, influencing the price of produce at a farmers' market.

Through these two main hypotheses, appropriate hypothesis testing will inform us whether or not the variables selected are appropriate to measure an effect or change on the figure trying to be derived.

Objective 1 Hypothesis Testing

The hypotheses derived were aimed to answer: What factors influence produce price differences that will lead to price savings among farmers' markets and grocery stores? And, How should vendors at the markets competitively price their produce? This hypothesis is used to determine if the following factors affect the price of produce at a farmers' market: average grocery store price, whether or not the farmers' market vendor's prices are influenced by current grocery store prices, whether the vendor is considered to be full-time or part-time, the total acres used throughout their operation, how many years they have participated in farmers' markets, their age, and dummy variables for the defined regions throughout Florida:

$$H_0 : \beta_n = 0$$

$$H_a : \beta_n \neq 0$$

The hypothesis statement is: Average grocery store price, price influence from grocery stores, full-time status of the vendor, total acres used throughout the operation, years of participation in farmers' markets, age, and what region the market is in influences the price of produce farmers' markets. When conducting this analysis, it is important to remember that during the study design, it was determined that the state of Florida would be divided into five regions. A regression pricing model was derived for the state of Florida and then will further be explained with respect to the five different regions, so that the pricing schematic is most appropriate for the area of the farmers' market in Florida.

The reasoning behind further interpreting the equation on a per region basis, for five different regions, is because each region included a different set of price variables.

For each region, a “basket” of produce prices at farmers’ markets were recorded. Next, for each item within the “basket” of produce, the average price for the produce within the region was regressed against the price of that item at the farmers’ market. If all of the data and observations were ran all together and there was no difference in the observations of produce used throughout the analysis process, the model would not properly reflect each region sufficiently; it would reflect the whole state of Florida. Therefore, the regression was ran with categorical dummy variables for each region, so that the effect of each region could be measured independently and so that all other observations of predictor values could be used throughout the analysis.

The following ANOVA tables will be presented for the state of Florida, and then an overall F-test will be conducted to test if the overall hypothesis statement is true or false.

Justification of Including Variables – Objective 1

There are ten predictor variables and one dependent variable that went into creating the pricing models for each region: *FMPrice*, *AvgGSPr*, *PrInf*, *FullPart*, *TotAcres*, *YrsBus*, *Age*, *R1*, *R2*, *R3* and *R5*. Table 4-1, below, provides details regarding these variables. In order to properly predict a price, trends and current prices are taken into account and a tool or regression equation is devised to predict future prices. Likely, in order to predict farmers’ market prices, we must include the recorded prices at the farmers’ markets. This is our dependent variable and it is what we are trying to predict or solve for.

As stated above, two of the three supporting hypotheses include: grocery store prices should influence farmers’ market pricing and potential savings should influence farmers’ market pricing. In order to show that these supporting hypotheses are true, it

Table 4-1. Variables Used in the Pricing Model.

Variable Name	Representing	Description
<i>FMPPrice</i>	Farmers' Market Price, Dependent variable	Price of produce at farmers' markets
<i>AvgGSPr</i>	Average store price, predictor variable	Average price of the corresponding type of produce at a grocery store
<i>PrInf</i>	Price Influence, dummy predictor variable	If the vendors' prices are influenced by grocery store prices
<i>FullPart</i>	Fulltime or Part-time, dummy predictor variable	Represents whether the vendor considers themselves to be fulltime or part-time
<i>TotAcres</i>	Total Acres Used in Operation, predictor variable	How many acres are used throughout the vendor's operation
<i>YrsBus</i>	Years in Business, predictor variable	How many years the vendor has been participating in farmers' markets
<i>Age</i>	Age, predictor variable	The age, in years, of the vendor
<i>R2</i>	Region 2, categorical predictor variable	Region 2 includes all of south Florida
<i>R3</i>	Region 3, categorical predictor variable	Region 3 includes central Florida
<i>R4</i>	Region 4, categorical predictor variable	Region 4 is north, central Florida
<i>R5</i>	Region 5, categorical predictor variable	Region 5 includes the panhandle of Florida

was necessary to include the average grocery store price for each item of produce; the average percent cost savings is simply the average of the difference between *FMPPrice* and *AvgGSPr*, and was not necessary to include in the equation. *PrInf* is a dummy variable that explains whether or not the vendors' prices are influenced by the current grocery store price. This predictor was included because whether their prices are influenced or not will have an effect on *FMPPrice*, the price of produce at farmers' markets.

FullPart is another dummy variable that is included; the vendor is either considered to be full-time or part-time. It is hypothesized that if the vendor is full-time,

they most likely have a higher amount of money invested in capital, therefore, reducing their overall production costs, as they should produce more efficiently.

TotAcres is a quantitative variable that measures how many acres are used throughout the total operation. This is hypothesized to be a way to measure how much of the produce is grown by the vendor and how much is either purchased or outsourced. *YrsBus* is how many years the vendor has been participating in farmers' markets. It is necessary to include this, as it is hypothesized that the longer the vendor is in business, the more effectively his produce is priced. The overall effect of years participating is of interest to be observed.

Age is the age of the vendor participating in the farmers' market; it is of interest to determine if the age of the vendor affects the price of their produce. *R2*, *R3*, *R4* and *R5* are the categorical dummy variables included in the regression, with region 1 as a our base region. Region 1 was chosen as a base region simply because it is the first region and one must be a base. It is imperative to include these categorical dummy variables, as the effect of each region on farmers' market price is of interest to be measured.

The reason for creating a model to address farmers' market pricing is to *predict* or make a prediction as to what the price should be. The most appropriate way to make this prediction is to include predictor/independent variables that can be determined and then filled in appropriately to predict the dependent variable.

In past studies, including Sommer, et. al's 1980 study of *Price Savings to Consumers at Farmers' Markets*, the grocery store prices and farmers' market prices were used to convey a percentage cost savings obtained by shopping at farmers' markets for produce. Because of this relationship and past studies noted, the economic

importance of such variables is conveyed, therefore, deemed appropriate to devise supporting hypotheses statements about what conclusions might be formulated, ultimately leading to the inclusion of such independent variables into the model.

Objective 2 Hypothesis Testing

We will now address the research question: What factors influence produce price differences that will lead to price savings among farmers' markets and grocery stores? In order to test this and conclude whether or not price differences are actually achieved by purchasing produce at a farmers' market as opposed to a grocery store, it was appropriate to test the price difference of the produce between the markets and the grocery stores, and the full-time status of the vendor at the pertinent farmers' market. For this study, a vendor was either characterized as being a full-time grower/vendor at farmers' markets or a part-time grower/vendor or hobby farmer at the markets. To test the hypothesis: price difference and vendor full-time status influence overall average percent price savings at farmers' markets, the following null and alternative hypotheses were derived:

$$H_0 : \beta_n = 0$$

$$H_a : \beta_n \neq 0$$

Where β_n is described as the price difference between the two sources of produces and the full-time status of the vendor. Let H_0 represent that the two factors, price difference and full-time status, have no effect on the overall average price savings obtained at farmers' markets. Let H_a represent that the two factors, price difference and full-time status, do have an effect on the overall average price differences, transposed into how much profit margin is foregone, obtained at farmers' markets.

The hypothesis statement to be tested is: Price difference and vendor full-time status have an effect on the overall average price differences between farmers' markets and grocery stores. In order to test this hypothesis, an F-test—as described throughout Objective 1 Hypothesis Testing—is appropriate to determine if the predictor variables are significant or not.

Justification of Including Variables – Objective 2

There are five variables that went into creating the average percent price difference model for the state of Florida: InConsSavAmt, FMPrice, AvgGSPrice, Fulltime, and FTPTPriDiff. By including each variable, the supporting hypotheses of: produce prices are lower at farmers' markets when compared to grocery store prices for the same "basket" of produce, the price difference between the selected item of produce at a farmers' market and its average price at the surrounding grocery stores influences the overall average percent price differences, and whether the vendor is full-time or part-time influences how vendors price their produce and, therefore, influences overall average percent price differences are addressed and set up in an approach to be tested and answered. Average percent price differences can be interpreted as profit margins that the vendor is missing out on. The interaction term between full-time status and price difference between farmers' market price and grocery store price was generated because this model aims to provide emphasis on the vendor's full-time status and that affect on the amount a consumer will save.

Each variable tested significant at very high percentiles and there is economic justification behind including these variables. In order to properly predict a price, trends and current prices are taken into account and a tool or regression equation is devised to predict future prices. Likely, in order to predict farmers' market prices, we must include

the recorded prices at the farmers' markets. This is our dependent variable and it is what we are trying to predict or solve for.

Summary

In this chapter, the hypotheses are stated and the process of how they are tested is discussed in detail. Economic and statistical justification for why certain variables are included within each regression model is stated and explained. The general linear models are set up, pertinent variables are plugged in and the null and alternative hypotheses are set up so that they may be tested throughout the following chapter, *Results and Recommendations*.

The following chapter will discuss more of the results and recommendations for the study, as well as present a summary of findings and the limitations of the study.

CHAPTER 5 RESULTS AND RECOMMENDATIONS

Purpose and Objectives

The purpose of this project is to obtain price information among farmers' markets and grocery stores so it is possible to advise farmers that participate in markets to price their produce more competitively so that they may attract a broader customer base and ensure the prosperity of farmers' markets. Objectives of this study include: collecting tangible price relationship data, summarizing and analyzing pertinent trends/relationships among vendor responses and pricing, as well as distributing valuable information to farmers that participate in the markets.

The two primary objectives include addressing: What factors influence produce price differences that will lead to price differences among farmers' markets and grocery stores? How should vendors at the markets competitively price their produce? These objective statements offer the most promising affect of addressing the problem statement and are devised to fulfill a solution to the current problems at hand:

Objective 1: To advise vendors at farmers' markets on how to competitively price their produce. The primary purpose of this study is to provide concrete analysis with numbers to better advise farmers how to more competitively price their produce so that they may attract a broader consumer base.

Objective 2: To convey average grocery "basket" price differences to vendors. In order to bridge the knowledge gap, as well as convey how much profit vendors are potentially missing out on, it is important that average grocery "basket" price differences are computed and conveyed through a written report. If a vendor knows of the potential profit they are missing out on, they will be in a better position to approach pricing their produce more effectively. Potential profits that could be made is essentially how much of a price difference there is between farmers' markets prices and grocery store prices, with the assumption that produce is less expensive at farmers' markets. On the other hand, taking on the assumption that grocery stores offer less expensive produce, vendors at farmers' markets will know how to adjust their prices more competitively in the same respect.

- To collect price analysis data among farmers' markets and grocery stores: The same types of produce will be analyzed based on a price relationship alone. Produce will be converted into a price/pound unit expressed in American dollars (\$). The results of this study will be examined on a per county basis to provide further recommendations on pricing and encouraging awareness for each market.
- Analyze and interpret data: Once the price data and completed surveys have been obtained, further investigation among possible relationships between the two sources will be examined. Through this examination process, we hope to draw conclusions to better advise the vendors on how to more so competitively price their product(s).
- Obtain information and produce articles conveying the results of this study: As a land grant university, the University of Florida holds a certain responsibility to the community to obtain and distribute valuable information to provide solutions for their everyday way of life. The community includes vendors at farmers' markets. By offering producers price information on price differences of produce, we are not only offering a start to help them to more competitively price their produce, we are also providing producers a way to make a higher profit in the long run.

Summary of Findings

Survey Responses

Approximately thirty-five different farmers' markets were visited throughout the state of Florida. Fifty-two surveys were completed; the surveys were administered in person in an interview-like style. Three surveys could not be completed at that point in time and they were later filled out and submitted via postal mail. Approximately 368 produce items were analyzed throughout the study. Their market price per pound was recorded and then the price per pound of that produce item at the grocery store was recorded.

Demographics

Demographic results were reported on vendor full-time status, ethnicity, age, type of produce grown, whether they grow or purchase their own produce items, and their

feelings and attitudes towards the current consumer base. Findings for each demographic response were reported individually in their own respective section.

Significance Testing and Pricing Model

The ANOVA table below, Table 5-1, represents the two hundred twenty-eight observations used for the pricing model. Each observation count is equal to one count of a variety of produce at an individual market. For example, two hundred twenty-eight different types of produce and their corresponding grocery store prices were recorded. The pertinent qualitative information was analyzed with the respective vendor and that vendor's type of produce. The following variables were used within this regression analysis:

- **FMPrice** : This is the price of a variety of produce at a farmers' market.
- **AvgGSPPrice** : This is the price average of the corresponding variety of produce at the surrounding grocery stores closest to the farmers' market.
- **PrInf** : This is a dummy variable that indicates a '1' if the vendor's prices of their produce are influenced by grocery store prices and a '0' if they are not influenced.
- **FullPart** : This is a dummy variable that takes on a value of '1' if the vendor considers themselves "full-time" or a '0' if they consider themselves "part-time."
- **TotAcres** : This is the total amount of acres used in the vendors operation that produces, if any, items sold at a farmers' market. This is hypothesized to be somewhat indicative of how much produce the vendor grows and how much is outsourced or purchased and then sold.
- **YrsBus** : This is the total number of years that a vendor has participated at farmers' markets.
- **Age** : This is the age of the vendor.
- **R2, R3, R4, and R5** : These are categorical dummy variables representing their corresponding regions. Region 1 is used as a base region. R2 is region 2, R3 is region 3, R4 is region 4, and R5 is region 5.

Table 4-1 in the previous chapter further explains all of these variables, including their variable name, what they represent and a brief description.

Table 5-1. Pricing Model ANOVA.

The SAS System		15:28 Tuesday, March 16, 2010			
The REG Procedure					
Model: MODEL1					
Dependent Variable: FMPrice					
Number of Observations Read 370					
Number of Observations Used 228					
Number of Observations with Missing Values 142					
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	947.646	94.765	88.85	<.0001
Error	217	231.439	1.06654		
Corrected Total	227	1179.085			
Root MSE	1.03273	R-Square	0.8037		
Dependent Mean	1.52219	Adj R-Sq	0.7947		
Coeff Var	67.84510				
Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	-1.0547	0.3634	-2.90	0.0041
AvgGSPr	1	0.8259	0.0289	28.62	<.0001
PrInf	1	-0.5209	0.2261	-2.30	0.0222
FullPart	1	0.4751	0.2030	2.34	0.0202
TotAcres	1	-0.00028	0.0012	-0.24	0.8076
YrsBus	1	0.00914	0.0062	1.47	0.1420
Age	1	0.0213	0.0091	2.34	0.0202
R2	1	-0.6536	0.2683	-2.44	0.0157
R3	1	-0.8184	0.3188	-2.57	0.0109
R4	1	-0.6308	0.3720	-1.70	0.0914
R5	1	-0.7413	0.3237	-2.29	0.0230

When conducting an F-test, as related to hypothesis testing, if the absolute value of the observed F-value, F_{obs} , is greater than the critical F-value, F_c , then we choose to

reject the null hypothesis, H_0 , and conclude in favor of the alternative hypothesis, H_a . If the critical F-value value is greater than the absolute value of the observed F-value, then we would choose to fail to reject the null hypothesis, H_0 , and conclude in favor of H_0 . To find a critical F-value, we must obtain a numerator degrees of freedom, $(k-1)$, and a denominator degrees of freedom, $(n-1)$. For this model, we have a numerator degrees of freedom set at $(k-1)$ 10 and a denominator degrees of freedom set at $(n-1)$, 227; when computed at the 0.001 α -level, this results in a critical F-value score of 3.103.

To convey that the model is significant at the highest percentile level, the F-test was conducted at a 0.001 probability level. To conduct the F-test, the observed F-value in the ANOVA table is compared to the critical F-value of 3.103:

$$F_{obs} = 88.85$$

$$F_c = 3.103$$

$$F_{obs} 88.85 > F_c 3.103$$

The observed F-value is greater than the critical F-value, therefore, we would reject the null hypothesis and conclude that $\beta_n \neq 0$ and that the predictor variables included within the model do affect the price of produce at a farmers' market.

Now that we know that the predictors included within the analysis do have an effect on the price of produce at a farmers' market, we can include these independent predictor variables within our regression equation used to determine the price at a farmers' market. Although the model tests conclusive for overall significance, one of the predictor variables, *TotAcres*, is not very statistically significant. We would like for all of our variables to be statistically significant to be further interpreted appropriately, so we will now run a reduced model regression, dropping *TotAcres* from the model to see if it

Table 5-2. Reduced Pricing Model ANOVA.]

The SAS System 15:28 Tuesday, March 16, 2010

The REG Procedure
 Model: MODEL1
 Dependent Variable: FMPrice

Number of Observations Read 370
 Number of Observations Used 274
 Number of Observations with Missing Values 96

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	950.636	105.626	108.68	<.0001
Error	264	256.570	0.97186		
Corrected Total	273	1207.207			
Root MSE	0.98583	R-Square	0.7875		
Dependent Mean	1.48712	Adj R-Sq	0.7802		
Coeff Var	66.29123				

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	-1.0932	0.2899	-3.77	0.0002
AvgGSPPr	1	0.8102	0.0270	30.04	<.0001
PrInf	1	-0.4674	0.1746	-2.68	0.0079
FullPart	1	0.4497	0.1860	2.42	0.0163
YrsBus	1	0.0079	0.0043	1.85	0.0661
Age	1	0.0232	0.0067	3.47	0.0006
R2	1	-0.6340	0.2530	-2.51	0.0128
R3	1	-0.8321	0.2853	-2.92	0.0038
R4	1	-0.6351	0.3455	-1.84	0.0671
R5	1	-0.7664	0.3071	-2.50	0.0132

has an effect on any of our numbers. Now, we would have a general linear model

expressed as:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 + \varepsilon$$

Note that we now have nine predictor variables, instead of the previous 10, as *TotAcres* has been dropped. When we run the reduced model analysis, the following ANOVA is produced:

To show that the model is significant at the highest percentile level, the F-test was conducted at a 0.001 probability level. To conduct the F-test, the observed F-value in the ANOVA table is compared to the critical F-value with 9 numerator degrees of freedom and 273 denominator degrees of freedom, producing a coefficient of 3.218:

$$F_{obs} = 108.68$$

$$F_c = 3.218$$

$$F_{obs} 108.68 > F_c 3.218$$

The observed F-value is greater than the critical F-value, therefore, we would reject the null hypothesis and conclude that $\beta_n \neq 0$ and that the predictor variables included within the model do affect the price of produce at a farmers' market.

Although both models are significant, the reduced model now has predictors that are all statistically significant, a higher F-value and all of the predictors are now more significant than before. With this, we set our dependent variable to be *FMPrice*; this is the price of a variety of produce at a farmers' market in the state of Florida. Our independent variables, or predictor variables, will be: *AvgGSPr*, *PrInf*, *FullPart*, *YrsBus*, *Age*, *R2*, *R3*, *R4* and *R5*. With these variables combined, we come up with the following regression equation:

$$FMPrice = \beta_0 + \beta_1(AvgGSPr) + \beta_2(PrInf) + \beta_3(FullPart) + \beta_4(YrsBus) + \beta_5(Age) + \beta_6(R2) + \beta_7(R3) + \beta_8(R4) + \beta_9(R5) + \varepsilon$$

We finally fill in the appropriate variable values from the ANOVA table and come up with our Pricing Model:

$$FMPrice = -1.093 + 0.810(AvgGSPr) - 0.467(PrInf) + \\ 0.450(FullPart) + 0.008(YrsBus) + 0.023(Age) - \\ 0.634(R2) - 0.832(R3) - 0.6351(R4) - 0.766(R5)$$

We can further conclude that a one dollar increase in the average price of produce at a grocery store will cause that same produce's price to increase at farmers' markets, but only by \$0.81. This is approximately a 20% savings obtained by purchasing produce at a farmers' market. We can also conclude that if the market is in region 2, the price of produce will be \$0.63 less per pound; at region 3 markets, the price of produce will be \$0.83 less per pound; if the market is in region 4, the price of produce will be \$0.64 less per pound; if the market is in region 5, produce will be \$0.77 less per pound. Please note that these are all averages.

Average Percent Price Differences ANOVA and Model

The ANOVA table below, Table 5-3, represents the 368 observations recorded using the whole state of Florida farmers' markets. Three hundred sixty-eight different types of produce and their corresponding grocery store prices were recorded, as well as their corresponding qualitative responses. The pertinent qualitative information was analyzed with the respective vendor and that vendor's type of produce. The following variables were used within this regression analysis:

InAvgPriceDiff : this is an average percent price difference between produce at grocery stores and farmers' markets. The average percent price difference can be transposed or thought to be the profit margin that a vendor is missing out on if the value is positive (i.e. [GSPrice – FMPrice]). If a grocery store is charging a certain amount that is greater than the price at farmers' markets, then essentially, the vendor can charge as much as the grocery store given the same or better quality

Table 5-3. Average Percent Price Difference ANOVA.

The SAS System 13:35 Monday, November 2, 2009 9

The REG Procedure
 Model: MODEL6
 Dependent Variable: lnAvgPriceDiff

Number of Observations Read 368
 Number of Observations Used 271
 Number of Observations with Missing Values 97

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	73.87080	18.4677	54.75	<.0001
Error	266	89.73106	0.33733		
Corrected Total	270	163.60186			

Root MSE	0.58081	R-Square	0.4515
Dependent Mean	-1.06846	Adj R-Sq	0.4433
Coeff Var	-54.35911		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	-0.56103	0.06872	-8.16	<.0001
FMPPrice	1	-0.82281	0.06662	-12.35	<.0001
AvgGSPPrice	1	0.22343	0.02105	10.61	<.0001
FTPTPriDiff	1	0.07164	0.02598	2.76	0.0062
Fulltime	1	-0.20581	0.08239	-2.50	0.013

produce. A natural log of the coefficient was chosen because *average cost savings* will be interpreted as an overall percent change.

FMPPrice : this is the price of a variety of produce at the farmers' market

AvgGSPPrice : this is the price average of the corresponding variety of produce at the surrounding grocery stores closest to the farmers' market (i.e. competitors of the farmers' market)

Fulltime : This is a dummy variable that takes on a value of '1' if the vendor considers themselves "full-time" or a '0' if they consider themselves "part-time"

FTPTPriDiff : This is an interaction term between the dummy variable, *Fulltime*, and the price difference between the farmers' market and the grocery store for each variety of produce

The same F-test procedures were performed for standard F-testing procedures outlined under the Region 1 ANOVA section. For this model, we have a numerator degrees of freedom set at $(k-1)$, 4, and a denominator degrees of freedom set at $(n-1)$, 367; this results in a critical F-value score of 3.37.

To convey that the model is significant at the highest percentile level, the F-test was conducted at a 0.01 probability level. To conduct the F-test, the observed F-value in the ANOVA table is compared to the critical F-value of 3.37:

$$F_{obs} = 54.75$$
$$F_c = 3.37$$
$$F_{obs} 54.75 > F_c 3.37$$

The observed F-value is greater than the critical F-value, therefore, we would reject the null hypothesis and conclude that $\beta_n \neq 0$ and that farmers' market price, average grocery price savings, full-time status, and the full-time status/price difference interaction term are all a significant and contribute towards predicting average percent price savings.

Further, average percent price savings were obtained on a per region basis. Region 1 customers will save an average of \$0.69/pound, equal to 30.93% price savings; region 2 customers will save an average of \$0.63/pound, equal to 10.59% price savings, region 3 customers will save an average of \$0.64/pound, equal to 28.71% price savings; region 4 customers will save an average of \$2.12/pound, equal to 39.03% price savings; region 5 customers will save an average of \$0.22/pound, equal to 13.06%.

This can further be interpreted as the amounts of a profit margin that a vendor is missing out on, as all the values are positive.

Price Differentiation

A table examining type of produce, average farmers' market price (\$/lb), average grocery store price (\$/lb), price difference (\$/lb), and average percent price difference between farmers' market prices and grocery store prices can be found in *Appendix E* following this chapter.

The table shows that if the Price Difference shown in column 3 is a positive integer, then the price at the farmers' market was higher than at the grocery store, on average. If the integer in column three is negative, then the price at the farmers' market was lower than at the grocery store, on average. Therefore, the average percent price difference shown in column 4 takes on the same properties.

When including all varieties of produce, the average price difference between farmers' markets and grocery stores was found to be -\$1.43/lb. The average percent price difference was found to be -19.34% difference per pound. We can interpret this as saving approximately nearly 20% on produce purchased at farmers' markets as opposed to grocery stores, on average, throughout the state of Florida.

Objective 1

Objective 1 stated that we proposed to find a pricing model to help vendors more competitively price their produce. This objective was completed and fulfilled by creating a pricing regression model with categorical dummy variables to represent each region, with region 1 as a base region. By including the pertinent variables, it is possible to create the average farmers' market price. The models is shown below:

$$\begin{aligned}
 FM\ Price = & -1.093 + 0.810(AvgGSPr) - 0.467(Pr\ Inf) + \\
 & 0.450(FullPart) + 0.008(YrsBus) + 0.023(Age) - \\
 & 0.634(R2) - 0.832(R3) - 0.6351(R4) - 0.766(R5)
 \end{aligned}$$

The affect of pricing by each region is easily determined by setting the correct categorical dummy variable to '1.' With this, it is possible to figure the average price of produce at a farmers' market in the corresponding region.

Objective 2

The second objective was to figure out how much of a price difference exists between farmers' market produce and grocery store produce. If this price difference is a positive integer, it can then be interpreted as price savings to consumers, as well as lost profit margin to vendors. Figuring out the average price differences between farmers' markets and grocery stores satisfied the second objective.

Limitations of the Study

Vendor Differentiation

The primary focus of this study is involved with investigating the vendors of the farmers' markets. The samples of vendors being surveyed were all participants in a farmers' market. Some vendors were responsible for the produce they were selling throughout the whole growing process—from the dirt to the selling table. Other vendors purchased produce from a wholesale location that was not recorded and then sold the same purchased produce at the farmers' market. There is a large difference in the two types of vendors, but the majority of them had one thing in common—both types relied on farmers' markets as a source of income.

Possible limitations exist when advising and implementation of findings are conveyed. As far as advising vendors who grow their own produce, many things come

into question: costs of production, growing seasons, weather conditions, farming equipment available, worker compensation and many other factors of production. When advising vendors who purchase their produce from a wholesale outlet, the only factors that come into question are: growing seasons and point of purchase. Both types of vendors can be advised on how to more competitively price their produce, which is why this limitation of the study will not affect the overall objective statements and study design and findings. Regardless of where the produce is obtained, the main focus objective is to encourage all vendors to more appropriately price their produce.

Omitting Opportunity/Cost Framework

As mentioned above, the only sample that will be surveyed consists only of vendors at farmers' markets; no patrons of the markets were formally interviewed. The primary objective is involved with only vendors of farmers' markets. Although patrons of farmers' markets would offer a lot of insight and recommendations, they did not have an effect on any of the survey questions or price collection process, nor would their feedback contribute to the overall effectiveness of the models derived.

Opportunity cost framework would be necessary to take into consideration aspects of consumer purchase decision making when involved with farmers' markets. Grocery stores offer somewhat of a convenience factor that farmers' markets cannot compete with. Many grocery stores are turning into "one-stop-shops." By this, a consumer can walk into one store and purchase just about every household necessity as well as a full stock of grocery items and produce.

The basic idea behind effort/accuracy framework is that the strategy used in the decision making process represents an adaptive balancing and sacrificing of the goals, as well as trying to be as accurate as possible while conserving limited cognitive

resources. (31) In a study composed in 1993, Kleinmuntz and Schkade noted that the choice of a strategy for decision making will be based on subjective *ex ante* estimates of relative effort and accuracy and these estimates will not always be truthful. It is also noted in the study that adaptivity may also fail in situations characterized by multiple task or context variables with differing implications for adaptive processing. (24)

Because of the opportunity for failure in this framework, investigating a consumer's opportunity/cost framework that could or could not have an effect on the purchase decision-making process will not be investigated throughout this study. Therefore, the decision not to include a surveyed sample of patrons at farmers' markets offers another limitation of the study. This is due to the fact that the opportunity or cost of time a consumer of a farmers' market might endure is not used as a variable within the derived models for this study.

Conclusions

Now that a pricing model has been established and the amount of potential lost profit margins has been solved, the next step is the interpretation and implementation of the results and findings of this study. In order to advise vendors to more competitively price their produce, a regression model alone will not do the job. To show vendors how to more competitively price their produce, average farmers' market prices and average grocery store prices for the same corresponding type of produce must be conveyed on a per region basis. In order to predict what the average price/lb would be for produce at a farmers' market, the pricing model is appropriate.

Facts, figures and numbers all join together to convey how much of a price difference is established between farmers' market produce prices and a grocery store produce prices. In order to bridge the gap in between lost profit margins and the

uncertainty of a pricing schematic, action must be taken immediately and vendors must know at what rate they should raise or lower their prices. As observed, most of the time, farmers' market produce throughout the state of Florida is equal or better quality than produce at a grocery store. If a farmers' market offers better quality produce, wouldn't it make sense for them to charge more for the product? This is not what is observed in practice. As mentioned in the results section, farmers' markets charge 10-50% less than the surrounding grocery store.

Our tested hypotheses and supported hypotheses tested to be true, as we rejected the null hypotheses and concluded that our independent, predictor variables used are significant and should be used to predict our dependent variables. We also found that it is possible to provide some sort of framework to predict what the price should be at a farmers' market, depending on what region the market is located. Along with this, average price savings were obtained and it was found that produce at farmer's market is priced approximately 10-50% less than the produce found at grocery stores.

The conclusions drawn support and fulfill the appropriate objective statements and, therefore, contribute to the purpose of this study. All research was collected objectively and as shown above, some produce was found to be priced higher at the farmers' market than at the grocery store. However, the overall price savings were obtained at farmers' markets, shown above as well. It was determined that every region throughout the state of Florida obtained price savings while shopping at farmers' markets for their produce, as opposed to grocery stores.

Recommendations for Practice

First and foremost, it is recommend that the vendors at farmers' markets try to use some sort of a framework to price their produce more competitively. The model

presented is not necessarily the easiest mechanism towards implementing this recommendation, but it at least lays some sort of framework that leaves room for practice.

Vendors in Alachua County were asked to express their opinion of the most convenient way for the results of this study to be presented to them so that they may more competitively price their product. All of them responded by questioning how much of a price difference actually exists. Price difference percentages were offered and vendors responded by asking for prices from both sources. From this, the most feasible way to convey price differences, and ultimately explain how much profit vendors are possibly missing out on, is to offer recorded prices from both farmers' markets and surrounding grocery stores. Results should be distributed on a per region basis, indicating what types of varieties of produce markets offered, as well as prices charged and grocery store prices.

It also recommended that vendors work more on promoting the price differences between farmers' markets and grocery stores. This can be translated into how much can be saved by paying patronage to a farmers' market, rather than purchasing produce at the grocery store. This can be accomplished by simply creating signs or advertisements to display to the public. Many patrons don't even realize that a market exists within their community. If a flyer were sent out with a schedule of markets for the upcoming month, they would likely experience a larger customer base.

Once the new clientele base is obtained, the vendors must do their best to keep these customers, as the customers are experiencing somewhat of an time/convenience costs by separating their produce purchases from grocery item purchases. In order to

keep them coming back, the market must provide not only a price savings incentive, but they also must offer produce of a higher quality and caliber. If these recommendations are met, the farmers' markets should experience more customers, higher profits, and the guarantee that they will always have an outlet to sell their produce so that it may contribute to their annual gross income.

Recommendations for Future Research

The study is ground breaking in the area of Florida farmers' market pricing and leaves room for a lot of further research. Although the results and conclusive findings can be put into practice at this point in time, they offer room for a more accessible way to be implemented. Recommendations and ideas for future research are discussed as follows.

It would be extremely useful if the data obtained from this study, along with the regression equation models were all converted into some sort of a computer program so that the pertinent independent variable values may be plugged in and then the dependent variable of interest be solved for. This would make the researched material much more user friendly and easily accessible by vendors at markets.

It would also be useful to produce a web site with current grocery store produce prices, as well as farmers' market produce prices. Plug in the average price savings regression equation into a program and then make it all accessible through the web site. This way, consumers could go online and check out prices, types of produce available, and then finally, have access to how much they could be saving by attending farmers' markets.

This study provides a pricing model for a combined "basket" of produce. It was not possible to devise a pricing model for every type of produce for every region due to

the lack of data available. It would be useful to continue to collect prices from markets throughout Florida and create models that would appropriately price produce on a per item basis.

A huge area for further research is to investigate consumers at farmers' markets as the sample census, instead of the vendors. Combining the two studies would yield a very useful data set and explanations to meet a lot of objectives regarding farmers' markets. There is a lot of room for further objectives targeting the consumer base to be created.

A study involving opportunity/cost framework would be appropriate for future studies. As mentioned, it is less convenient for consumers to purchase produce at one venue and the rest of their groceries at another. What would the price have to be in order to create more opportunity than cost for the consumer to visit both venues? This would be a very useful study to help farmers' more competitively price their produce as well.

Summary and Final Thoughts

In this chapter, all researched propositions were proposed, tested and justified. All propositions stated have resulted to be true through traditional F-test significance testing. Once the propositions were stated to be true, the first objective statement was fulfilled by the creation of a pricing model and the amount of profit margin that a vendor is potentially missing out on. Average percent price savings were also determined on a per region basis. The propositions stated primarily included analysis of the quantitative variables, especially prices among farmers' markets and grocery stores.

Summaries of demographic findings and a price comparison/average price difference per item of produce table was introduced and discussed. Finally, recommendations for practice and hopes/ideas for future research were explained.

The research conducted was extremely rewarding, as future plans for this study once implemented will benefit the sustainability of agriculture throughout the state of Florida. By introducing a scientific method framework and collecting data for farmers' markets, a new frontier has been ventured. We have high hopes that advocates of Florida agriculture will find this research of priority for Florida agriculture and pursue future studies regarding farmers' markets. Researching and visiting farmers' markets has been a joy and a pleasure; I hope this study will serve them all well.

APPENDIX A
2008 FARMERS MARKET AND GROCERY STORE PRICE RELATIONSHIP SURVEY
– PAGE ONE

Farmers market and grocery store price relationship survey | 2008

Farmers markets across the state of Florida have been increasing in popularity over the past two years. Very little information is available regarding the price relationship between farmers markets and nearby grocery stores. Further investigation of this relationship is necessary and could yield vital information to support further understanding of pricing trends among these two sources.

WE HOPE THAT YOU WILL ENJOY PARTICIPATING IN THIS SURVEY AND WE APPRECIATE YOUR TIME AND INTEGRITY. FIRST, WE WOULD LIKE TO KNOW ABOUT YOUR INVOLVEMENT IN FARMERS MARKETS FROM THE PRODUCTION SIDE.

Please indicate your response with a check in the appropriate box.

1. Do you participate in farmers markets? No → If no to question 2, please do not complete the rest of the survey and turn it in as is. Yes

↳ If yes to question 1, how many years have you participated in farmers markets? years

2. If yes to question 1, please tell us about the land used in your operation that contributes to the production of what you sell at the farmers market.

What is the total number of acres in your operation? acres

What is the total number of acres actively used for production? acres

What percent of land in production is owned? %

What percent of land in production is rented? %

What percent of your items are.....produced/grown by you %.....outsourced %

3. Using the list below, tell us how many years you have been offering the product or service at a farmers market, and the percent of total annual gross sales for your operation.

	Number of Years	Percent of Total Annual Gross Sales
Horticultural Crops		
Culinary or Medicinal Herbs	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Cut Flowers	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Flowers and Bedding Plants	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Fruits, Citrus	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Fruits, Deciduous	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Fruits, Other Tropical	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Fruits, Small	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Vegetables, Field	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Vegetables, Greenhouse	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Woody Landscape Plants	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %
Other (describe) _____	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> %

APPENDIX B
2008 FARMERS MARKET AND GROCERY STORE PRICE RELATIONSHIP SURVEY
– PAGE TWO

Farmers market and grocery store price relationship survey | 2008

3. (Continued)	Number of Years		Percent of Annual Gross Sales	
Forage and Field Crops				
Grain Crops				%
Hay				%
Pasture				%
Peanuts				%
Silage				%
Tobacco				%
Other (describe) _____				%
Livestock				
Cattle				%
Dairy Products				%
Goats				%
Horses				%
Poultry				%
Rabbits				%
Sheep				%
Swine				%
Other (describe) _____				%
Other Enterprises				
Agri/Eco/Heritage Tourism				%
Aquaculture				%
Beekeeping				%
Christmas Trees				%
Hunting Leases				%
Timber and Associated Products (Pine Straw)				%
Value-Added Products (Cheese, Jams, Salsa)				%

4. How many years have you practiced any of the following production strategies? *If none, please indicate with '0' years.*

Certified organic production	<input type="text"/>	years
Follow organic regulations but not certified	<input type="text"/>	years
Follow organic principles, but with some conventional inputs	<input type="text"/>	years
Conventional production	<input type="text"/>	years
Other production (describe) _____	<input type="text"/>	years

APPENDIX C
2008 FARMERS MARKET AND GROCERY STORE PRICE RELATIONSHIP SURVEY
– PAGE THREE

Farmers market and grocery store price relationship survey | 2008

THE FOLLOWING QUESTIONS ARE GEARED TOWARDS BETTER UNDERSTANDING YOUR OPINION/ATTITUDES TOWARDS FARMERS MARKETS.

5. Have you noticed an overall increase of a customer base for farmers markets? No
 Yes

▶ If yes to question 4, do you believe this is influenced by current grocery store prices? No
 Yes

6. Grocery stores do not typically stock local produce. Do you believe this contributes to a broader customer base for farmers markets? No
 Yes

▶ If yes to question 5, has a customer told you they pay patronage to farmers markets to support local farmers? No
 Yes

▶ Please explain: _____

7. What benefits do believe farmers markets offer? (please check all that apply)

- Offer local produce
- Quality assurance
- Knowledge of the item that is being sold
- Personal attention to a unique shopping experience

8. Are your prices influenced by local grocery stores' pricing? No
 Yes

▶ If yes, to what extent/percentage?: _____

→ At what rate do you increase or decrease your prices with respect to local grocery prices? _____

9. Do you know the current grocery price today for the items you are selling? No
 Yes

▶ If yes, how do you monitor or how do you know these prices?: _____

10. Do you believe your prices are typically less expensive or more expensive than what a customer would find in a grocery store in the surrounding area? Less expensive
 More expensive

Regardless of your answer to question 10, what is the reasoning behind your pricing, whether your items are more or less expensive? _____

APPENDIX D
2008 FARMERS MARKET AND GROCERY STORE PRICE RELATIONSHIP SURVEY
– PAGE FOUR

Farmers market and grocery store price relationship survey | 2008

11. Do you have any sort of an informal/formal contract or agreement with grocery stores as to how you go about your pricing? No

Yes

▶ If yes, please elaborate: _____

12. Do growing seasons have an impact on the availability and pricing of your products?

13. How do you think your customers perceive your prices in comparison to grocery store prices?

- Positive
 Negative
 No reaction

▶ Please elaborate: _____

THE FOLLOWING QUESTIONS ARE REGARDING YOUR PERSONAL GROCERY SHOPPING TRENDS.

14. Do you shop at grocery stores? No

Yes

▶ Which grocery stores do you pay patronage to; and why? _____

If yes to question 14, approximately what portion of the food your household consumes is purchased at a grocery store? _____

15. Does the majority of the produce your family consumes come from what you grow or do you purchase it at a grocery store?

Grow the produce myself

Purchase produce from a grocery store

PERSONAL INFORMATION:

Age: _____

Gender: Male / Female

Do you consider yourself a full time or part time/hobby farmer? Full time / Part time/hobby

What is your ethnicity? White Hispanic African-American Native American Other

APPENDIX E
PRICE DIFFERENCES OF PRODUCE AT FARMERS' MARKETS AND GROCERY STORES

Table E-1. Average Prices and Price Differences of Produce at Farmers' Markets and Grocery Stores.

Type of Produce	Average Farmer's Market Price (FMPrice) \$/lb	Average Grocery Store Price (GSPrice) \$/lb	Price Difference (FMPrice-GSPrice) \$/lb	Average % Price Difference (FMPrice-GSPrice)
Apples, Fuji	1.70	1.85	-0.15	-8.29
Apples, Gala	3.00	2.19	0.81	36.99
Apples, Golden Delicious	1.77	1.46	0.32	21.74
Apples, Granny Smith	1.92	2.29	-0.38	-16.38
Apples, Red Delicious	1.28	1.40	-0.13	-9.07
Apricots	2.99	2.99	0.00	0.00
Arugula	4.32	6.14	-1.82	-29.70
Asparagus	3.00	2.62	0.37	14.23
Avocado, Florida	1.42	2.17	-0.76	-34.78
Avocado, Hass	3.60	2.98	0.62	20.81
Basil	13.50	33.58	-20.08	-59.80
Beans, Green	2.31	1.99	0.32	15.89
Beans, Pole	1.50	2.99	-1.49	-49.83
Beets	1.77	6.34	-4.56	-72.03
Blackberries	3.50	2.48	1.02	41.13
Blueberries	2.99	2.07	0.92	44.57
Broccoli	1.12	1.54	-0.41	-26.86
Brussel Sprouts	1.55	2.99	-1.44	-48.16
Cabbage	0.63	0.70	-0.07	-9.88
Cantaloupe	0.92	1.04	-0.12	-11.67
Carrots	0.67	1.06	-0.40	-37.35
Cauliflower	0.85	1.15	-0.30	-25.79
Chives	8.00	31.84	-23.84	-74.87
Celery	1.74	1.14	0.59	51.75

Type of Produce	Avg FM Price	Avg GS Price	Price Diff	Avg % Price Diff
Coconuts	0.86	1.50	-0.65	-43.00
Corn, Yellow	0.50	0.73	-0.24	-32.44
Cucumbers	0.80	1.15	-0.39	-30.72
Cucumbers, Salad	0.45	1.89	-1.44	-76.19
Cumquats	2.00	3.00	-1.00	-33.33
Dill	8.00	31.84	-23.84	-74.87
Eggplant	1.27	1.68	-0.40	-24.07
Garlic	2.31	2.07	0.24	11.74
Ginger	1.38	5.33	-3.95	-74.20
Grapes, Red Seedless	1.12	2.34	-1.22	-52.14
Grapefruit, Pink	0.59	0.74	-0.15	-20.54
Grapefruit, Ruby Red	0.91	2.57	-1.65	-64.36
Greens, Collard	2.27	3.16	-0.89	-28.27
Kiwi	1.77	1.69	0.08	4.44
Leeks	0.60	1.58	-0.98	-61.90
Lemons	1.27	2.15	-0.88	-41.13
Limes	1.53	1.42	0.10	7.24
Lettuce	1.43	1.64	-0.20	-12.45
Lettuce, Romaine	1.71	2.44	-0.74	-30.13
Mango	1.43	10.64	-9.21	-86.56
Mushrooms, Portobello	6.40	4.24	2.16	50.94
Mushrooms, White	3.26	1.92	1.35	70.41
Nectarines	1.87	3.09	-1.22	-39.40
Okra	2.70	2.63	0.07	2.83
Onion, Green	3.29	1.36	1.93	142.51
Onion, Red	0.69	1.28	-0.59	-46.25
Onion, Sweet Vidalia	1.25	1.22	0.03	2.50
Onion, Yellow	0.79	1.29	-0.50	-38.51
Oranges, Golden Navel	0.97	1.62	-0.65	-40.12

Type of Produce	Avg FM Price	Avg GS Price	Price Diff	Avg % Price Diff
Oranges, Honeybell	2.00	1.25	0.75	60.00
Oranges, Red Navel	0.40	0.41	-0.01	-2.44
Oranges, Red Seedless Navel	0.54	0.82	-0.28	-34.15
Oranges, Valencia	0.89	1.50	-0.61	-40.67
Parsley	0.25	1.83	-1.58	-86.32
Peaches	1.85	1.59	0.26	16.35
Pears, Bartlett	1.26	2.99	-1.73	-57.86
Pears, Bosc	1.70	2.29	-0.59	-25.76
Pecans	3.00	2.99	0.01	0.33
Peppers, Banana	1.00	2.45	-1.45	-59.18
Peppers, Cubanelle	1.38	1.86	-0.48	-25.97
Peppers, Green	1.70	2.31	-0.61	-26.33
Peppers, Jalapeno	1.61	2.52	-0.91	-36.16
Peppers, Pablano	3.95	3.30	0.64	19.45
Peppers, Yellow	2.91	1.37	1.54	112.41
Plums	1.50	1.32	0.18	13.38
Pineapple	1.77	1.39	0.38	27.17
Potatoes, Idaho	0.63	1.31	-0.68	-51.96
Potatoes, Red	1.25	1.41	-0.16	-11.45
Potatoes, Yukon Gold	0.40	1.49	-1.09	-73.15
Raddish, Daikon	1.23	34.24	-33.01	-96.42
Rosemary	4.25	4.78	-0.53	-11.09
Squash, Acorn	1.25	1.66	-0.40	-24.43
Squash, Butternut	1.29	1.66	-0.37	-22.33
Squash, Spaghetti	0.35	1.29	-0.94	-72.87
Squash, Yellow	1.35	1.91	-0.56	-29.19

Type of Produce	Avg FM Price	Avg GS Price	Price Diff	Avg % Price Diff
Strawberries	2.52	2.83	-0.31	-11.11
Spinach	3.03	3.29	-0.26	-8.00
Tangerines	1.07	1.23	-0.16	-13.00
Tangelos	0.82	0.83	-0.02	-1.81
Temples	0.80	1.00	-0.20	-20.00
Thyme	0.50	36.64	-36.14	-98.64
Tomatoes, Beefsteak	1.15	2.75	-1.60	-58.15
Tomatoes, Grape	2.18	2.51	-0.33	-13.29
Tomatoes, Plum	1.11	1.49	-0.38	-25.50
Tomatoes, Red	1.56	2.16	-0.61	-28.04
Tomatoes, Vine Ripes	1.83	2.69	-0.86	-31.85
Turnips	0.99	1.49	-0.50	-33.56
Watermelon	0.79	0.44	0.35	81.19
Zucchini	2.14	1.99	0.15	7.50

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BIOGRAPHICAL SKETCH

Ashley Nicole Earl was born in 1985 in Miami, Florida. The oldest of two children, she grew up mostly in Homestead, Florida, graduating number 21 in her high school class, from South Dade Senior High School in 2003. She was apart of the first graduating class at Miami-Dade Honors College, Kendall campus, earning her A. A. in Biology in 2005. She then earned her B.S. in Animal Science, with a minor in Agriculture Communications, with an emphasis in Animal Biology from the University of Florida (UF) in 2008. Ashley enrolled in the Master of Science degree seeking program in 2008 at UF, majoring in Food and Resource Economics, with an emphasis in Statistics.

Throughout her undergraduate studies at UF, she competed on the Equestrian Team, where she served as team Captain for the western team. She was also a member of Block and Bridle and the Pre-Vet Club, where she held offices as well. Throughout graduate school, she has taken on leadership positions such as Graduate Student Organization Treasurer and helping with the Food and Resource Economics department graduate Orientation.

Ashley owns two horses: Brandy and Sweetpea, named after her late grandfather. Ashley is passionate about horseback riding and hopes to incorporate horses in her everyday life from here on out. She grew up fishing with her dad and friends and loves the sport, as well as being on the water—just as she loves all things that are outdoors.