

**THE ECONOMIC DETERMINANTS OF THE NUMBER OF MINORITY  
FARMERS IN THE SOUTHERN REGION OF THE UNITED STATES, 1969-1997**

by

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## **ABSTRACT**

The primary purpose of this research was to identify and quantify the determinants of the number of minority farms in the Southern region of the United States during the time period, 1969-1997. A second objective was to determine the impact of globalization and international trade agreements on the number of African-American farmers in the Southern region of the United States. Regression results indicate that minority farm labor was responsive to the returns to agriculture labor relative to nonfarm labor returns, as well as to cotton and rice prices. Increase in the cotton price increased minority farmer income, slowing the rate of agricultural migration from the Southern region of the United States. To the extent that globalization results in lower cotton prices, international agricultural trade agreements are likely to result in further movement of minority farmers out of agriculture in the Southern region of the United States.

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*“All Things Are Possible To Him That Believe”* Mark 9:23

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**Table 1.0 Abbreviations**

<i>Variables</i>	<i>Description</i>
Lag =	Number of minority farmers in each Southern State
Lnonag =	Labor in non agriculture in each Southern State
M =	Labor migration
D =	(non agriculture GDP per person/agriculture GDP per person)
g =	(labor in non agriculture/labor in agriculture) = (Lnonag/Lag)
Pr =	real price of rice
Pc =	real price of cotton
AL	Alabama
AR	Arkansas
FL	Florida
GA	Georgia
KY	Kentucky
LA	Louisiana
MI	Mississippi
NC	North Carolina
SC	South Carolina
TN	Tennessee
VA	Virginia
WV	West Virginia
Pi =	i = corn commodity price, rice
Wag =	wage rates in agriculture
Wnonag =	wage rates in non agriculture
GDPag =	gross domestic product in agriculture
GDPnonag =	gross domestic product in non agriculture

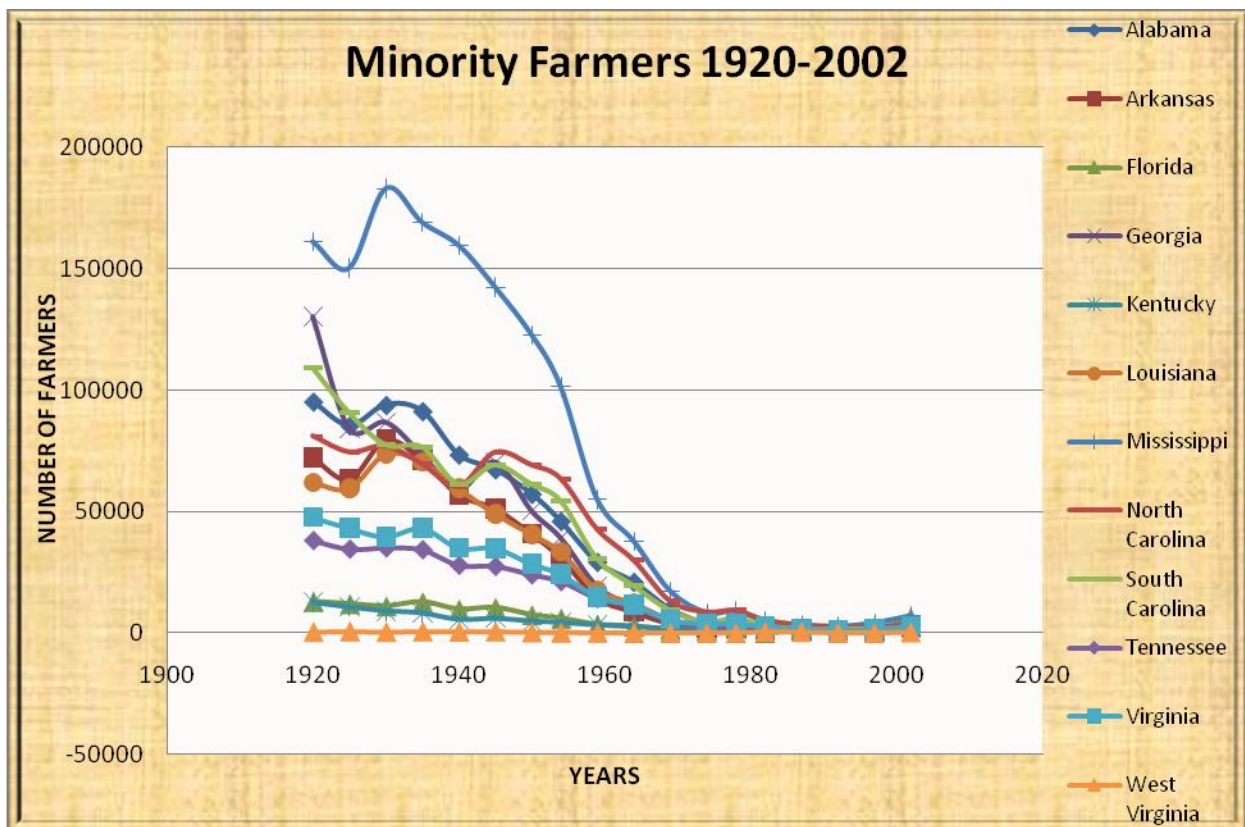


# CHAPTER 1 – INTRODUCTION

## 1.0 Background

African-American farmers today face many challenges that are subject to considerable uncertainty such as public policies, economic pressures, and racial oppression. The problem that many African-American communities face is a lack of resources such as the loss of landownership and farming operations. One of the most interesting and important issues that many economists and other social scientists have raised is the continually decreasing number of African-American farmers, as illustrated in figure 1.

**Figure 1 The Total Number of Minority Farmers from 1920-2002: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.**



Source: U.S. Department of Commerce. Bureau of The Census.

There have been several studies that were conducted to better understand the significance of African-American farm numbers, particularly in the Southern Region of the United States. Minority farmers are more prominent in the Southern Regions of the United States than any other region. According to Brown and Larson (1977), the number of Black-operated farms reached a peak of 925,710 in 1920. By 1969, the number of Black-operated farms had dropped 90.6% to 87,393, compared with a drop of 64% for all farms in the South and 57.7% for all farms in the nation. According to Calvin Beale (1966), the rural population for African-Americans was highly concentrated in agriculture, and 97 percent of it was in the South. He also stated that African Americans migrated away from southern farms as a result of new opportunities in the industrial Northern part of the United States and that a decline in the total rural black population took place that had never been reversed until 1966. However, the USDA National Agricultural Statistics Service (USDA/NASS, 2008) released their 2002 Census of Agriculture results in June 2008 that showed an increase in the percentage of land ownership among Black or African American principal operators since the previous Census. According to the 2002 Census of Agriculture news release, ninety-one percent of Black or African American principal operators represented 1.4 percent of all principal farm operators in the U.S. and out of that total 56 percent listed farming as their primary occupation, indicating that the number of minority farmers in the agriculture population has been miscalculated due to methodology constraints.

According to Gilbert, Sharp, and Felin (2001), the total number of African-American farmers decreased over time because of the loss of landownership and farming operations, as well as other contributing factors. In 1990, a study that was done by Demissie found that both the average gross income and average total acres operated for non-white farmers was less than half that of white farmers, and non-white farmers left farming at a much higher rate.

However, Beale (1971) believed that the displacement over the last 20 years has been due to voluntary withdrawal or old age of the great majority of black farm operators. Another interesting fact is that the principal role of African-American farmers has changed over time from hired farm workers to machinery operators. In this paper we will not only discuss the data on African-American farmers, but also discuss 1) previous case studies concerning the problems that minority farmers faced over time and 2) possible determinants of minority farmers migrating to and from the field of agriculture.

## **1.1 Study Objectives**

The main objective was to identify and quantify the determinants of the number of minority farmers in Southern Region of the United States from the period 1969 to 1997. A second objective was to determine the potential impact of international trade agreements on the number of African-American farmers in their career choices to either stay or migrate into another career field. A third objective is to determine the migration rates of minorities out of agriculture with all farmers in the southern region. In the United States today, the effect of trade liberalization on agriculture is a very important topic. Discovering the core motives as to why there was such a significant decrease in minority farmers over the period 1969-1997 would extend the literature on minority migration out of agriculture in the United States. Previous literature has shown that many minority farmers have moved from rural areas into the urban sector largely due to financial obligations. Wood, Spencer, and Gilbert (1998) found that most African-American farmers depended principally on off-farm income, with farming as a secondary source. A limited number of studies, mostly census-based, provided evidence for the continuing decrease in the number of African-Americans entering the field of agriculture, and the likeness of more future farmers to come. This research will explore the potential correlation

between the number of minority farmers and international trade, based on the number of farmers who have migrated out of the farming sector during the years of 1969-1997. Although the potential effect that the correlation between the number of farmers in general and international trade could also have a positive effect on migration, however; our concerns were particularly to target minority farmers instead. The question that this paper attempts to answer is: “Does the effect of free trade have a positive or negative impact on the number of minority farmers in the Southern region?”

## **1.2 Organization of the Study**

The remaining chapters of this thesis are organized as follows. Chapter 2 reviews previous research conducted on minority farmers’ economic and social potential of migrating into and out of the field of agriculture. Chapter 3 identifies the methodology utilized in this study. Chapter 4 presents the sources of data and the procedures used in modifying the raw data set into usable data for the estimated model. It also presents and defines the dependent and independent variables. The methodology includes brief descriptions of the data and data sources, including calculations used to convert nominal prices to real prices. Chapter 5 presents the econometric results from each variable and provides interpretation for a small change in each of the independent variables. Chapter 6 includes a discussion of the implications of the results, limitations of the research, and suggestions for future research.

## **CHAPTER 2 - LITERATURE REVIEW**

The purpose of this chapter is to briefly summarize some of the previous published work on the migration of labor out of agriculture. Also reviewed are studies that discuss the population of minority farmers as well as the concerns of land ownership, which has been a large issue for decades concerning minority farmers. Another major topic is the impact of trade liberalization on small scale farms.

### **2.0 Migration of Agricultural Labor**

Migration research has dealt mainly with the forces which affect migration and how strongly they have affected it, but little has been done to determine the influence of migration as an equilibration mechanism in a changing economy. Greenwood (1975) defined migration as farmers moving from one occupation to another for better opportunities. The questions that are considered in this thesis are; “How many minority farmers migrated out of agricultural career fields to fields of non-agriculture?” and, “What were the primary causes for their migration?”

The term migration is one of the most popular economic terms. A general study on migration usually is estimated by wage rates rather than the total number amount of minority farmers. For an example, if an individual responds to wage rates by migrating, it is usually assumed in several studies as a positive response to wage rates increases; will cause a direct response to an increase in migration. Stark (2003) described migration as when an individual responds to a wage differential by migrating. The individual can be said to exhibit a taste for a high wage. But it can also be the case that the individual who responds to a high wage by migrating is the one who possesses an underlying taste for migration. We define migration as when a minority farmer leaves farming to migrate to another open career, mainly due to the

potential for an income increase, better opportunities for family, or a better way of life in general.

## **2.1 Small-Scale Farmers and Trade Liberalization**

In the mid-1960s the U.S. Department of Agriculture calculated that a farmer had to sell at least \$310,000 worth of products annually to make the net income of \$2,500, which at that time was considered as the minimum decent level of living and the typical minority-owned farmer could not produce at least half of that amount (Beale, 1966; p. 179). In the late 1900's the USDA reported that due to insufficient sales, 94 percent of all black-operated farms failed and were considered as a measure of inadequacy, meaning that their farms were not functioning at a normal state than the typical farm; in which was reported by the Census of Agriculture as having sales of less than \$10,000 providing evidence that there were some form of struggle particular with Minority farmers rather than White farmers. In 1986, it was reported that about half of black-operated farmers were less than 50 acres in size and produced less than \$2,500 in sales per year (Banks, 1986). In 1987 it was reported that 89% of black operated farmers had annual sales of less than \$20,000 (Demissie, 1990). Schulman (1989) reported that both the average gross income and average total acres operated for non-white farmers were less than half that of white farmers, leaving non-white farmers at a higher risk of migration. Dawra (1990) asked why a farmer would want to explore other opportunities, to maintain a decent level of living. One reason might be that majority of small-scale farmers have been adversely affected by a decline in prices, which has caused an increase in debt. A second possible reason could be due to the steady downward trend in prices, as well as their lack of resources mainly due to their classification in society, such as upper class, middle class, and lower class.

A third possible reason could be because farming is among the least cost-effective occupations in their region, which gives them the option to look into other career fields (Dawra, 1990).

Several case studies have revealed that a majority of Minority farm operators' are dependent on off-farm income, such as employment, blue or white collar jobs, and other relevant sources, or fall in the line of the federal government's official poverty classification (Brown and Larson 1977). Greenwood (1975) stated, "a finding common to a number of gross migration studies is that income (and job) opportunities provide a better explanation of in-migration than they do of out-migration" (p.400). This similar study also reported that both the determinants and consequences of nonwhite migration differ appreciably from those associated with white migration. Their studies suggested that whites were more responsive to the availability of job opportunities than nonwhites, but nonwhites are more responsive than whites to income opportunities. Their finding raises the question, why in 1997-2002 would there be an increase in minority farmers? Todaro (1969) researched the chronic problems of urban unemployment and underemployment in the developing countries and recognized that a pool of unemployed and underemployed urban workers would affect a prospective migrant's probability of finding a job in the modern sector. His results demonstrated that "premature mechanization of agriculture through the adoption of modern techniques of large-scale farming causes serious problems for rural labor absorption." Implying that if employment creation was to increase, it would cause for a steady stream attraction of rural migrants into the urban economy; in which will later cause an increase in the urban unemployment sector. The article written by Freund and Bolaky (2008) examined the relationship between openness and per-capita income using cross-country data from 126 countries. They found that "if the structure of economic activity is rigid then trade has

only a modest impact on the allocation of resources across and within industries, and hence only a modest impact on income” However, their regression data suggested that increased trade is associated with higher income, concluding that if trade increases across countries, income increases as well. (p.320). The next section will explore human capital.

## **2.2 Human Capital Theory**

Over time a large body of economic theory developed using the assumption that agricultural resources are homogeneous. However, according to previous research agricultural workers are not homogeneous. Research has indicated that there are several reasons as to why an individual would migrate in and out of agriculture (?) with one major reason being due to human capital theories. One human capital theory of migration is due to the history of a family’s household migration, which is thought to have a systematic effect upon migration behavior. Household responsibilities are the general factors that would cause an individual to migrate for newer and better opportunities such as employment (Lee and Roseman 1999). Browne (1973) research studied the effects of agricultural technology, farm subsidy programs, and general tendency for farm youth to gravitate toward urbanizes areas which in 1960 showed that more than 1.3 million African Americans left the South to migrate to Northern and Western urban communities. His research showed a clear relationship between land and African Americans with a very high significance between both social health of the general society, and for the black community’s welfare.

However, due to major tribulations that existed, many rural areas could no longer employ large numbers of small farmers and farm workers causing African American farmers to migrate.



Another human capital migration theory variable is climate indicators. According to the article by Bass and Alexander (1972), the choice of where to work due to the environment and climate may be as significant as to work and for whom to work for. Their research indicated that Whites were more attracted to better climatic and attractive work opportunities relative to Nonwhites, who were more attracted to better economic conditions. This result suggests that majority of Minority farmers would prefer to migrate to the South where the climate is not that attractive but the pursuit for better economic conditions such as public assistance, and the attractiveness of is higher employment rates.

### **2.3 Economic and Social Studies**

Research has indicated that a very high percentage of internal and international migration in the Third World is caused by individuals seeking better economic opportunities. International migration can be viewed as a form of investment in human capital. It has established that potential migrants estimated the costs and benefits of moving to international locations as a greater discounted net return over some period of time (Borjas, 1990). Several authors have done research on the study of the effects of trade on income and how it could cause someone to prefer trade liberalization over protectionism. Noguer and Siscart (2005) found that trade liberalization had a large and positive effect on national income and the estimated effect remained positive and significant. Their research consisted of trade being an endogenous variable and they used a geography instrument that was of a similar study by Frankel and Romer (1999) who also found that countries that traded more had higher levels of income.

However, in the study by Frankel and Romer (1999), no evidence was found that there was a positive association between international trade and income increases, mainly because

countries whose incomes were higher for other reasons engaged in more trade than others. Their estimations implied that by increasing the ratio of trade to GDP by one percentage point would raise income per person by between one-half and two percent.

Alcala and Ciccone (2004) found that international trade has an economically significant and statistically robust positive effect on productivity. They analyzed the effect of international trade on aggregate productivity across countries, using real openness (imports plus exports relative to GDP) as the measure of trade. Their findings argued that real openness is a better measure of trade than nominal openness due to the fact that real openness measures are distorted by cross-country differences in the price of nontradable relative to tradable goods. Distortions arise because of the openness is decreased in the relative price of nontradable goods, and nontradable goods are relatively more expensive in countries where production is more efficient. The cross-country differences in the relative price of nontradable goods do not affect real openness directly because the production of nontradable goods in different countries is valued at the same prices. Using the real openness in trade measures, they found that the causal effect of trade on productivity across countries is statistically and economically significant as well as robust. They also found that the productivity is affected in an economically and statistically significant way by the size of the actual country once international trade is taken into account.

The second possibility regarding the significant increase in minority farmers was from an economical and social standpoint. Brown, Christy, and Gebremldhin (1994) studied the influence of technical and institutional forces on the population increase of African American farmers. They argued that the changes in agricultural structures are a great implication for small-scale farmers in their strategic options for their farms that are structural constrained to increasing their farm sizes as well as other bearably implications.

Grim (1995) stated that between the 1950's and the 1970's there were several developments that drove more black farmers into agriculture such as: the Brown versus Board of Education in 1954, the growth and development of agricultural industries, improvement of technology, transportation, and many other factors. However, racism was seen as a major factor as to why minority farmers decreased over time. Protesters were forced to act due to the racism, which later caused the administered USDA farm programs to be implemented to help increase the total number of minority farmers. However, Grim still believes that in spite of the farm programs such as loan increases to Black Farmers, there were still a large amount of farmers who left the field to search for better jobs, educational opportunities, better housings, and more recreations.

This has obviously been an issue for some time according to Gilbert, Sharp, and Wood, (2002) article, "Who Owns the Land?" This article discusses how out of all private agricultural land, Whites accounted for 96 percent of the owners, 97 percent of the value, and 98 percent of the acre; while 25 million acres of land is owned by minorities. Their paper discusses the social, economic, cultural, and political consequences that are caused due to this land ownership. However, Molnar, Thompson, and Beauford (1988) believed that another cause of this decrease was due to the advent of machinery that encouraged large farms and eliminated the need for small-scale tenant farmers. They also believed that African Americans faced great structural barriers such as discriminatory attitudes that often blocked their advancement in agriculture.

However, research has also indicated that African Americans that actually owned land were also losing their land due to their inability to generate adequate income. This inability has caused a drop from 175,000 to 67,000 black-owned farmers between the years of 1954 and 1969, while; the amount of black-owned land fell from 10.6 million to 5.7 million. "This research

clearly indicated that with this rate; by the year of 2000, there would be no black-owned land left” (Salamon, 1976, p.3). This article also examined the use of giving minority landowners access to federally owned land that could help contribute to the viability of existing minority farm enterprises. A popular federally funded program that was started in the 1900s was the Agricultural Cooperative Extension Services (*ACES*). The *ACES* program helped African Americans to begin their career with better training, yet the white agents were still far better trained than African Americans. The purpose of the farming agents was to increase the number of farms and home agents in the southern states and to migrate more blacks into the field of agriculture. However, the problem with this structure was that “the average tenant or small independent African American farmer was not provided with the sufficient gainful occupation in the course of twelve months to provide the barest subsistence for himself and family” (p.533). “Ironically, in trying to help African American farmers to adjust in a rapidly changing environment, they were harbingers of change themselves” (Whayne, 1998).

Reynolds (2003) stated that increases in land ownership after the early 1900's were partly due to a significant rise in cotton prices that lasted until the outbreak of World War I in 1914. Reynolds' research was in agreement with Gilbert, Sharp, and Felin (2001). He stated that the Census reports from the 1997 to 2002 show a significant increase in land ownership in the South, particularly with black tenant farmers and sharecroppers. According to Ponder (1971), land ownership was of prime consideration to remaining in farming because the tenant had to give up his land when the owner wishes it and because of this the probability of minority farmers staying in the agricultural field would be low.

Wood and Gilbert (1998) also asserted that farming is not so glamorous and attractive to the younger generation due to the fact that it is looked at as a memory of slavery and sharecropping. Their beliefs are that we are wasting our time on trying to convince others to enter farming but to encourage the improvement of poor rural communities through education, training, and economic development. They believe that if agriculture would be a more viable business and a way of life by encouraging land retention and recovery efforts from the past, than the decline of African-American farmers and landowners could be reversed.

Wood and Gilbert (2000) stated that the primary reason for decline of African-American farmers was due to the twin engines of increased mechanization and the dismantling of the sharecropping system. The research primarily targeted African-American framers in the Southern state of the Mississippi Delta, however, their results showed that a significant amount of African-American farmers still owns their land and would like to return but due to public policies, economic pressures, and racial oppression, many minority farmers find it impossible to return.

Several studies have attempted to investigate the relationships between the flow of labor out of agriculture and economic variables that were expected to have influence the quantity of labor in the farm sector. However, the models only illuminated conditions in the agricultural labor market, but did not accurately explain migration as a decision made by rational economic agents (Barkley, 1990).

Barkley (1990) analyzed a migration model using two types of labor: all farm workers and farm operators. The results of his model demonstrated that when farm income increased, the level of agricultural employment increased.

Another two-sector approach that was utilized by disaggregating the economy into a production agriculture sector and a nonfarm sector but included more occupations was analyzed by Mundlak (2000). Mundlak's research was very similar to Barkley's and he also believed that if non agricultural jobs would be more attractive than agriculture, than you should expect a decrease in farm labor. However, his research also indicated that if agriculture was more attractive than non agriculture than you should expect an increase in farm labor. The next chapter describes the development of the migration model with details of the methodology.

## CHAPTER 3 – THEORY OF MIGRATION

Following Barkley (1990), a migration equation model was developed to examine the determinants of the number of minority farmers out of agriculture in the Southern Region of the United States. Historically, the decline in the share of agriculture in the farm labor force has occurred over centuries (Barkley). The term migration is an approximation to actual occupational migration out of production agriculture, and it considers only changes in the number of jobs in the farm sector. There are two ways of measuring changes in the number of workers in a given occupation such as agriculture: (1) the level of labor ( $L$ ), and (2) changes in this level, or the rate of migration ( $M$ ), as defined below. In equation (1), the function  $M$  represents net migration out of agriculture, while  $M_{ji}$  represents minority farmers who enter agriculture from the non farm economy.

$$(1) \quad M = M_{ij} - M_{ji}$$

This net migration ( $=M$ ) accounts for the possibility of individuals moving in and out of agriculture. Equation (2) is the equation used to determine the number of minority farmers from one Census year ( $t-5$ ) to the next Census year ( $t$ ).

$$(2) \quad M_t = \frac{Lag_{t-5} - Lag_t}{Lag_t}$$

where  $Lag_t$  = labor in agriculture in time  $t$ ,  $Lag_{t-5}$  is labor in agriculture in time  $t-5$ .

For example, the total amount of Labor in agriculture in year 2002, subtracted by the total amount of Labor in agriculture in year 1997, and divided it by the total amount of Labor in

agriculture in year 1997 which gives us the total percentage change of Labor in agriculture between 1997 or 2002 (equation 3). Given the large time  $L_{ag}$  of five years between each census, the measure of nonwhite agricultural labor is simply  $L_{agt}$ , the number of workers employed in agriculture in year t.

$$(3) \quad \% \Delta L_{ag} = \frac{L_{2002} - L_{1997}}{L_{1997}}$$

This approach was originally used in this study, but was modified to the level of agricultural workers ( $L$ ), to maximize the number of observations including data from the original date, 1969, since the migration definition in equation (3) requires the original year of data to define  $M$ . To determine the total amount of Labor in agriculture, we defined of  $L_{ag}$  to be a function of wages in agriculture and nonagricultural and agricultural output prices. Equations 4, 5, 6, 7 and 8 are the equations that were used to determine the total amount of labor migration out of agriculture.

$$(4) \quad L_{ag} = f(W_{ag}, W_{nonag}, P_i)$$

$$(5) \quad \text{where,} \quad W_{ag} = \frac{GDP_{ag}}{L_{ag}}$$

$$(6) \quad \text{and,} \quad W_{nonag} = \frac{GDP_{nonag}}{L_{nonag}}$$

where,

$P_i$  = price of crops

$P_c$  = cotton price

$P_r$  = rice price

Equation (7) is the definition of  $D$  the returns to labor in nonagriculture, relative to the returns to labor in agriculture.  $D$  is defined as the total non agriculture GDP per person divided by the total agriculture GDP per person.



$$(7) \quad D = \frac{\frac{\text{GDP}_{\text{nonag}}}{L_{\text{nonag}}}}{\frac{\text{GDP}_{\text{ag}}}{L_{\text{ag}}}}$$

Following Mundlak (2000) and Barkley (1990), the relative size of the labor force is introduced into the migration equation by defining  $g$  to be equal to the total amount of labor in non agriculture divided by the total amount of labor in agriculture, as in equation (8).

$$(8) \quad g = \frac{L_{\text{nonag}}}{L_{\text{ag}}}$$

In equation (9), we also used the real price indexes ( $P_i$ ) of two different crops, cotton and rice, to determine the level of migration. For an example, if the price of cotton  $P_c$  decreases, the number of minority farmers migrating into agriculture would decrease as well.

The number of workers in agriculture ( $L_{ag}$ ) is expected to depend on the relative size of the labor force in each sector, reflecting the probability of obtaining employment in each sector:

$$(9) \quad L_{ag} = f(D, g, P_c, P_r)$$

where  $D$  = non-agriculture GDP per person/agriculture GDP per person,  $g$  = labor in non-agriculture/labor in agriculture,  $P_c$  is the real price of cotton, and  $P_r$  is the real price of rice.

Our regression was estimated with the dependent variable equal to the total number of Minority farmers in each state of the twelve southern states, and the independent variables include  $D$ ,  $g$ , and cotton and rice prices. We estimated alternative regressions with using dummy variables for the states and years of 1969-1997. Also we tested several other independent variables including the prices of corn, soybeans, and sorghum. However, during our testing we found that these variables were not statistically significant. During the testing process we were able to eliminate four out of the six crop variables that were used due to potential

multicollinearity. Out of the six crops that were used, the only crops that we found to be of value were cotton and rice due to its level of significance.

The model is specified in (10).

$$(10) L_{ag} = \beta_0 + \beta_1 D + \beta_2 g + \beta_3 P_r + \beta_4 P_c + U$$

where:

$L_{ag}$  = labor in agriculture.

$\beta_0$  = The intercept of the regression line

$D$  = The total percentage of returns for non agriculture relative to returns for agriculture workers

$g$  = The total size of the labor force in nonagriculture relative to labor in agriculture

$P_r$  = The annual price of rice in the South

$P_c$  = The annual price of cotton in the South

$E$  = The error produced by the regression model.

The expected signs of our coefficients are (all other variables remaining constant):

$\beta_1 < 0$  As returns to labor in the nonagriculture sector increase relative to farm returns, we expect for the total percentage of farm workers to decrease, because as income would increase, more farmers would be attracted to better income opportunities.

$\beta_2 < 0$  As the total percentage of nonagriculture labor force increases, we expect for the total percentage of minority farm workers to decrease, because as the total number of workers were to increase in another area, than more workers would migrate because of the assumption of better jobs in that particular area.

$\beta_3 > 0$  As the price of rice increases, we expect for the total percentage of minority farm workers to increase. If the price for rice was to increase, more minority farmers would enter the field due to income increase. The income increase alone would cause better opportunities for the minority farmers.

$\beta_4 > 0$  As the price of cotton increases, we expect for the total percentage of minority farm workers to increase. If the price for cotton was to increase, more minority farmers would enter the field due to income increase. The income increase alone would cause better opportunities for the minority farmers.

Our research hypothesizes that as farming in the South becomes more attractive as it has in the past, more minority farmers will migrate to the South. As farming revenues and the prices for crop variables begin to increase, we should also expect for the total number of minority farmers to increase. The more resources, allocation, education, training, and economic development that we put into the field of agriculture, the higher our percentage of total number of minority farmers will increase. Our next section is the data section of all the data that was collected from variety of helpful sources, including the United States Department of Census data.

## CHAPTER 4 - DATA

### 4.0 Data Sources

The data were taken from the Bureau of the Census (US Department of Commerce) for the number of white and minority farmers in the South. According to the Census, in 1964 there were a total of 199,952 nonwhite farm operators in the United States, and of this total 92 percent were African Americans and 8 percent were classified as other nonwhite. Ninety-two percent of all nonwhite operators were in the South, and of these 98 percent were black and so being that the South had a larger percentage of African Americans (Ponder 1971). Therefore, our targeted areas were the 12 states in the Southern Region, including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

Data on the number of farmers in all twelve Southern states were collected from the United States Department of Commerce, Census Bureau. Real per capita gross domestic product (GDP) data were collected from the United States Department of Commerce Bureau of Economic Analysis (BEA). The data included the years of 1969 to 1997 for the 12 Southern states. We wanted to start the data with the year of 1920, but due to lack of data availability for Gross Domestic Product in agriculture and nonagriculture and an accurate account for the total of minority farmers, we were constrained to start the data in 1964. The GDP data were taken from the United States Department of Commerce/BEA website located under the Regional section for Gross Domestic Product by State. The GDP in Agriculture data were also taken from the same section but under the section named agriculture, forestry, fishing, and hunting. The GDP in Non Agriculture data was given just by subtracting the total GDP for each state from the total amount of All Farmers of each state.

## **4.1 Description of Crops**

### ***4.1.0 Cotton***

The first crop price that we used to test our data samples with was cotton. Cotton in the South is a very dominant single most important textile fiber cash crop in the world and generates three-fourths of the world's cotton supply and about 40 percent of the world's total fiber production. The United States, China, and India provides over half of the world's cotton out of 80 some countries, with the U.S. generating over 400,000 jobs from farming to textiles (USDA/ERS Briefing Room Cotton, 2008).

### ***4.1.1 Rice***

Rice was first founded in the USA in South Carolina and found its place in society mainly in the southern states such as Arkansas, Louisiana, and east Texas since the 1800s. "Rice is produced worldwide and is the primary staple for more than half the world's population. In the United States, rice farming is a high-cost, high-yielding, large-scale production sector that depends on the global market for almost half its annual sales." (USDA/ERS Briefing Room Rice, 2008).

The total amount of Employment was taken from the U.S. Department of Commerce BEA website located under Regional Economic Accounts and State Annual Personal Income.

Much of the other data used for this study were collected by the United States Department of Agriculture NASS (2008). The section that we used was the state data titled “Selected Characteristics of Farms by Specified Racial Groups, Sex of Operators, and Persons of Spanish Origin.” In this section, we looked for the data that was titled Farms and its numbers and the following years that were needed. Each state was broken down into columns labeled: Total, Black, American Indian, Asian or Pacific Islander, and Other.

The second set of data required inflation adjusted prices of rice and cotton. This information was taken from the annual publications of the (USDA/NASS Agricultural Prices). To adjust for inflation, the Consumer Price Index (CPI) was used, taken from the Bureau of Labor Statistics (United States Department of Labor, Bureau of Labor Statistics, 2008). Dollars were adjusted to 100 in 2007.

## 4.2 Minority Farmer Data

This section will present the main data used in this study, the number of minority farmers in 12 Southern states, 1964 to 2002.

**Table 4.1 Total Number of Minority Farmers, 1964-2002, Southern States**

Southern States	2002	1997	1992	1987	1982	1978	1974	1969	1964
Alabama	4,066	2,251	1,535	1,902	2,813	4,883	3,962	9,873	20,951
Arkansas	2,783	780	848	912	1,368	2,196	1,822	3,775	8,595
Florida	6,257	807	1,126	974	59	2,478	968	1,365	2,832
Georgia	3,374	1,487	1,177	1,297	2,102	4,551	2,963	5,571	11,239
Kentucky	2,049	593	714	747	1,006	1,210	1,053	1,753	2,483
Louisiana	3,172	1,580	1,182	1,253	1,951	3,400	2,723	5,518	12,300
Mississippi	6,935	3,925	2,523	3,033	4,831	8,887	8,173	17,184	37,715
North Carolina	3,677	2,212	2,498	3,303	5,352	9,289	8,605	13,111	29,926
South Carolina	2,794	1,949	1,819	2,038	3,170	6,489	4,606	9,535	19,616
Tennessee	2,700	1,201	1,042	1,278	1,672	2,477	2,391	4,930	10,660
Virginia	2,900	1,456	1,384	1,756	2,772	3,978	3,977	5,453	11,621
West Virginia	393	31	44	466	613	65	33	45	92

Source: USDA/NASS

Table 4.1 shows the total number of minority farmers from the years of 1964-2002. The Census data were collected from each state in different years out of the United States Department of Commerce Bureau of the Census. The numbers were calculated by subtracting the total number of all white farmers from the total number of farmers. The reason for the subtraction calculations was the Census data charts from the years of 1997 and back currently did not specifically include minority farmers. However, the census data only included white farmers and all farmers, giving us a percentage to calculate our total number of minority farmers migrating to and from agricultural career fields.

**Table 4.2 Total Numbers of White Farmers, 1964-2002, Southern States**

Southern States	2002	1997	1992	1987	1982	1978	1974	1969	1964
Alabama	57,863	39,658	36,370	42,265	45,635	47,573	52,716	62,618	71,579
Arkansas	65,838	44,208	43,089	47,330	49,157	50,063	49,137	56,658	71,303
Florida	60,195	33,481	34,078	35,582	35,366	34,939	31,498	34,221	37,710
Georgia	63,239	39,005	39,582	42,255	47,528	48,691	51,948	61,860	72,127
Kentucky	119,703	81,567	89,567	91,706	100,636	101,117	101,000	123,316	130,555
Louisiana	35,170	22,657	25,470	26,097	29,677	29,353	30,517	36,751	50,166
Mississippi	50,069	29,094	29,475	31,041	37,584	39,038	45,447	55,393	71,426
North Carolina	71,052	47,295	49,356	55,981	67,440	74,740	82,675	106,275	118,276
South Carolina	30,303	18,701	18,423	18,479	21,759	22,907	24,669	30,024	36,632
Tennessee	118,922	75,735	74,034	78,433	88,893	85,084	91,268	116,476	122,786
Virginia	65,793	39,854	40,838	43,043	49,087	46,778	48,722	69,119	68,733
West Virginia	28,946	17,702	16,976	17,191	18,688	17,423	16,876	23,097	34,412

Source: USDA/NASS

Table 4.2 is the total number of white farmers from the years of 1964-2002. The Census data were collected from each state for the period 1964-2002 out of the United States Department of Commerce Bureau of the Census books for each state. The numbers for all white farmers were given but listed as total white farmers.



**Table 4.3 Total Number of White and Non-White Farmers, 1964-2002, Southern States**

Southern States	2002	1997	1992	1987	1982	1978	1974	1969	1964
Alabama	45,126	41,384	37,905	43,318	48,448	50,780	56,678	72,491	92,530
Arkansas	47,483	45,142	43,937	48,242	50,525	51,751	50,959	60,433	79,898
Florida	44,081	34,799	35,204	36,556	36,352	36,109	32,466	35,586	40,542
Georgia	49,311	40,334	40,759	43,552	49,630	51,405	54,911	67,431	83,366
Kentucky	86,541	82,273	90,281	92,453	101,642	102,263	102,053	125,069	133,038
Louisiana	27,413	23,823	25,652	27,350	31,628	31,370	33,240	42,269	62,466
Mississippi	42,186	31,318	31,998	34,074	42,415	44,104	53,620	72,577	109,141
North Carolina	53,930	49,406	51,854	59,284	72,792	81,706	91,280	119,386	148,202
South Carolina	24,541	20,189	20,242	20,517	24,929	26,706	29,275	39,559	56,248
Tennessee	87,595	76,818	75,076	79,711	90,565	86,910	93,659	121,406	133,446
Virginia	47,606	41,095	42,222	44,799	51,859	49,936	52,699	64,572	80,354
West Virginia	20,812	17,772	17,020	17,237	18,742	17,475	16,909	23,142	34,504

Source: USDA/NASS

Table 4.3 is the total number of white and non white farmer's form the years of 1964-2002. This Census data were also collected from the United States Department of Commerce, Bureau of the Census. Although much effort was expended making the census mail list (CML) as complete as possible by National Agricultural Statistics Service (NASS), the total coverage of farms was not quite correct. Therefore, we began the literature review by assessing the total number of all farmers and the total amount of minority farmers from 1920 to 2002. Excluding the changes that occurred in 1997 when the US Department of Agriculture (USDA) conducted the census for the first time Gilbert, Sharp, and Felin (2001). Next, we will investigate how the number of minority farmers changed over the period 1969 to 1997, and compare the rate of change to that of all farmers during the same period. This allows us to see if minority occupational migration out of agriculture is similar to or different from all farmer migration.

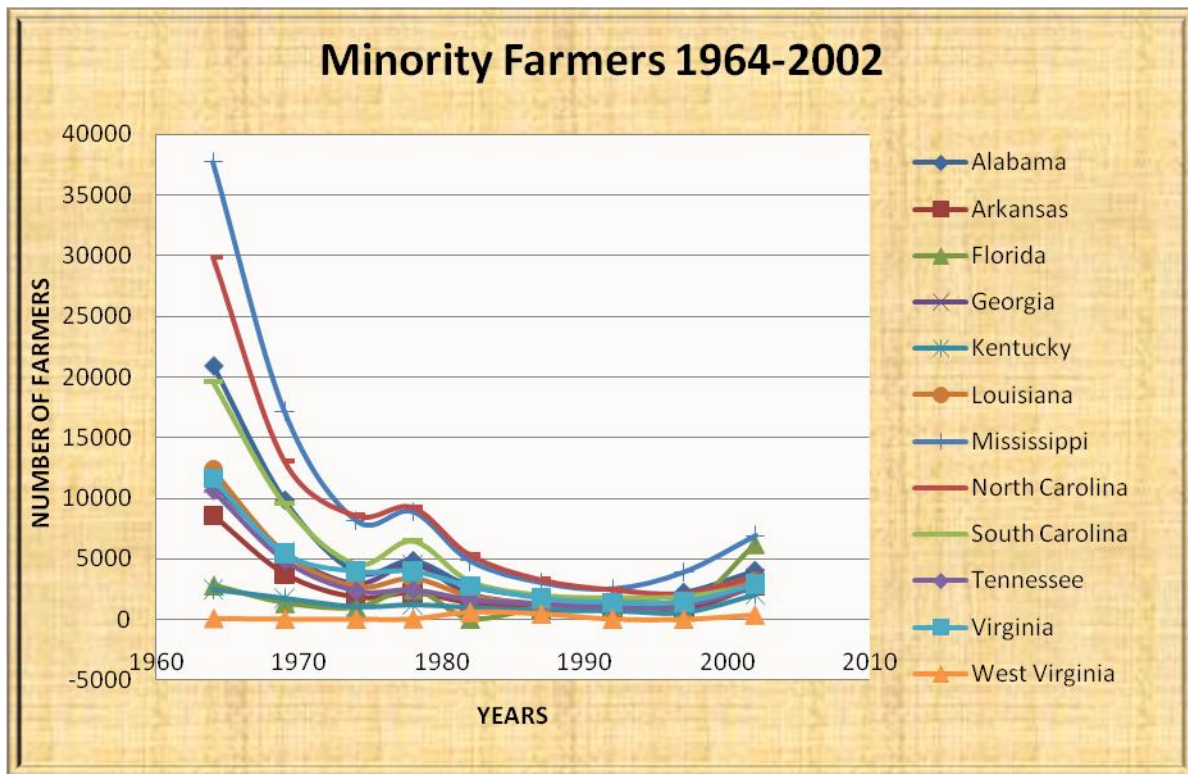
**Table 4.4 Structural Trends in the Twelve Southern States:  
Minority Farmers and All Farms, 1969-1997**

<b>Year(s)</b>	<b>State(s)</b>	<b><u>All Farmers</u></b>	<b>% Change</b>	<b><u>White Farmers</u></b>	<b>% Change</b>	<b><u>Minority Farmers</u></b>	<b>% Change</b>
<b>1997 1969</b>	<b>Alabama</b>	41,384 72,491	-42%	39,658 62,618	-36%	2,251 9,873	-77%
<b>1997 1969</b>	<b>Arkansas</b>	45,142 60,433	-25%	44,208 56,658	-22%	780 3,775	-79%
<b>1997 1969</b>	<b>Florida</b>	34,799 35,586	-2.2%	33,481 34,221	-2.1%	807 1,365	-40%
<b>1997 1969</b>	<b>Georgia</b>	40,334 67,431	-40%	39,005 61,860	-36%	1,487 5,571	-73%
<b>1997 1969</b>	<b>Kentucky</b>	82,273 125,069	-34%	81,567 123,316	-34%	593 1,753	-66%
<b>1997 1969</b>	<b>Louisiana</b>	23,823 42,269	-43%	22,657 36,751	-38%	1,580 5,518	-71%
<b>1997 1969</b>	<b>Mississippi</b>	31,318 72,577	-56%	29,094 55,393	-47%	3,925 17,184	-77%
<b>1997 1969</b>	<b>North Carolina</b>	49,406 119,386	-58%	47,295 106,275	-55%	2,212 13,111	-83%
<b>1997 1969</b>	<b>South Carolina</b>	20,189 39,559	-48%	18,701 30,024	-38%	1,949 9,535	-79%
<b>1997 1969</b>	<b>Tennessee</b>	76,818 121,406	-36%	75,735 116,476	-35%	1,201 4,930	-75%
<b>1997 1969</b>	<b>Virginia</b>	41,095 64,572	-36%	39,854 69,119	-42%	1,456 5,453	-73%
<b>1997 1969</b>	<b>West Virginia</b>	17,772 23,142	-23%	17,702 23,097	-23%	31 45	-31%

Table 4.4 presents data indicating the percent changes in the total number of all farmers as well as in the total amount of minority farmers. We took the total number of white and non-white farmers during the years of 1969 and 1997 to give us an overview of the structural trends that have taken place over time. The percentage of minority farmers has a higher decrease in change than the total number of white farmers. These results indicated that the change in farming with minorities were greater than the change in white farmers, showing us that there is a difference between minority farmers entering and exiting agriculture other than white farmers.

Take for an example the state of Alabama between the years of 1997-1969; had a percentage change for all farmers at -42%. The percentage change for white farmers was equal to a -36%. However, the percent change for minority farmers was equal to a -77%. There were a larger percentage of minority farmers entering and exiting the field of agriculture than it was for the total number of all farmers. However, if all farmer percentages were similar to minority farmers, then we could conclude that labor migration was similar for both minority and whites. Since the changes differ, minority migration levels differ, resulting in the motivation for this study of minority farmers.

**Figure 2 The Total Number of Minority Farmers from 1964-2002: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.**



Source: U.S. Department of Commerce. Bureau of the Census

In the next chapter, the model of migration will be empirically examined for minority farmers in 12 southern states.

## CHAPTER 5 –RESULTS

The purpose of this research project was to identify the determinants of the change in the number of minority farmers in the Southern Region of the United States, during 1969-1997. The second objective was to determine the impact of international trade agreements on the number of African-American farmers and their career choices in the Southern region of the United States.

**Table 5.0 Migration Model Variables Descriptive Statistics**

<i>Variables</i>	<i>Description</i>	<i>Mean</i>	<i>Std</i>	<i>Min</i>	<i>Max</i>
L	Total number of Minority farmers in each southern state	2977.67	330.20	31	17184
D	Ratio of nonfarm returns to agricultural returns in each southern state	1.24	0.09	0.23	4.28
g	Relative size of the labor force in non agriculture to agriculture in each southern state	52.54	4.39	9.65	230.85
Pr	price of rice (2007\$/cwt ) national average, deflated by CPI?	43.77	4.45	7.48	123.99
Pc	price of cotton (2007cents/lbs) national average, deflated by CPI	253.29	17.56	86.46	538.54

In Table 5.0 are listed descriptive statistics of the variables that were included in the migration model described in equation (10). The first variable *L*, total number of minority

farmers, had a mean of 2977.67, standard deviation of 330.30, minimum of 0.31 and a maximum of 17184. The second variable  $D$ , the ratio of nonfarm returns divided by farm returns, had a mean of 1.24, standard deviation of 0.09, minimum of 0.23 and a maximum of 4.279. The third variable  $g$ , the relative size of the labor force in non agriculture to agriculture, had a mean of 52.54, standard deviation of 4.39, minimum of 9.65, and a maximum of 230.85. The fourth variable  $Pr$ , which is the real price of rice, had a mean of 43.77, standard deviation of 4.45, minimum of 7.48, and a maximum of 123.99. The final variable  $Pc$ , the real price of cotton, had a mean of 253.29, standard deviation of 17.56, minimum of 86.46, and a maximum of 538.54.

Table 5.1 presents the regression results of the model and calculated elasticity's.

**Table 5.1 Regression Results for Number of Minority Farmers in Southern Agriculture, 1969-1997.**

<u>Variable</u>	<u>Coefficient</u>	<u>t-Stat</u>	<u>Elasticity</u>
Intercept	3477.031	2.698 ***	-
D	-1150.740	-2.973***	-0.48
g	-23.546	-2.743 ***	-0.41
Pr	-36.553	-1.129	-0.53
Pc	14.870	1.787*	1.26

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R-Square	0.297
Adj. R-Square	0.262
Standard Error	2600.588
Observations	84
F-test	8.35***

Notes: ‘\*\*\*’ indicates statistical significance at the one percent level, ‘\*\*’ indicates statistical significance at the five percent level, and ‘\*’ indicates statistical significance at the ten percent level.

The regression model reported in table 5.1 expands upon those utilized in previous studies undertaken by the United States Department of Economic Research Services and the United States Department of Bureau and Labor Statistics. In this regression model, the adjusted  $R^2$  statistic equaled 0.262, which means that 26.2 percent of the variation in the number of minority farmers was explained by this model. Our results concluded that economic variables are

statistically significant in the determinants for minority farmers migrating to and from the field of agriculture. The dependent variable of our model, ( $L$ ) is the total number of minority farmers in agriculture in each southern state. The intercept was equal to 3477.03, indicating the “baseline” number of farmers in each southern state.

Our next regression results were for the independent variables  $D$ ,  $g$ ,  $Pr$ , and  $Pc$  which were all significant except  $Pr$ . The first independent variable ( $D$ ) defined as the ratio of nonfarm returns divided by farm returns, was significant at the (0.01) percent level. This result shows that if the total number of nonfarm returns to agricultural returns was to increase by one, then the total number of minority farmers would decrease by 1150.740 persons. Meaning that as income was to increase in the non-agricultural sector, and then more minority farmers would leave the field of agriculture for better income opportunities. The second independent variable  $g$ , defined as the relative size of labor force in nonagriculture to agriculture had a significance level of (0.01) percent. This result shows that if the relative size of the labor force in non-agriculture to agriculture was to increase by one, then the total number of minority farmers would decrease by 23.546 persons. Meaning that as the number of workers in the nonagricultural sector begins to increase; the total number of minority farmers would decrease because of the possibility of better job opportunities as measured by the variable  $g$ .

The third independent variable,  $Pr$ , has no statistically significant value and is interpreted to be not statistically significantly different than zero. The fourth variable,  $Pc$ , the price of cotton, was also found to be significant but at the (0.10) percent level. This result indicates that if the price of cotton was to increase, the total number of minority farmers in the South would increase by 14.84 persons. This result provides the conclusion that as the price of cotton increases, more minority farmers would either stay or enter into the field of agriculture.

This conclusion has also allowed us to forecast the potential impact of globalization and free trade agreements on minority farmers migrating to and from the field of agriculture. If free trade barriers were to be broken, the prices of cotton in the United States are most likely to decrease and cause minority farmers income to decrease as well, giving them a reason to exit the field of agriculture. Therefore, this research provides some quantitative evidence that globalization and international trade agreements are likely to decrease the number of minority farmers in the southern region of the United States.

The regression results in table 5.1 also expand upon the elasticities which allow for comparison of impact of each independent variable on the number of minority farmers. The elasticities were calculated at the mean values. The first independent variable ( $D$ ), the ratio of nonfarm returns divided by farm returns, had an elasticity of negative 0.48. The second independent variable  $g$ , the ratio of the size of labor force in nonagriculture to agriculture, had an elasticity unit of negative 0.41. The third independent variable,  $Pr$ , price of rice, had no statistically significant value, and its elasticity was interpreted as not statistically significantly different as zero. The fourth variable,  $Pc$ , the price of cotton, had an elasticity of 1.26, indicating that the number of minority farmers was most responsive to cotton prices during the time period under investigation.

In the next chapter, a discussion of the implications of the research as well as the need for further research will be discussed. This section of the paper investigates the question of, “Does the effect of trade have a positive or negative correlation on the number of minority farmers located in the southern regions of the United States?”

## **CHAPTER 6 –CONCLUSIONS AND IMPLICATIONS**

### **6.0 Conclusions**

In conclusion, this study has provided empirical evidence that (a) minority farmers' response to economical conditions in the Southern Region of the United States is statistically significant and (b) the returns to farming, relative to nonfarm occupations returns to labor is associated with a direct correlation with a minority farmer's decision to migrate into or out of the field of agriculture and (c) globalization and international trade are likely to also cause a response to minority farmers migration. In today's society, farming is neither an option nor a necessity unless there is an economic benefit for farmers. For this reason, it has caused fewer minority farmers to continue into the field of agriculture. The responsiveness of labor to migrate in or out of the field agriculture based on labor returns is one primary determinant of minority farmer's occupational choice. Our research has shown that economic determinants have a direct effect on the number of minority farmers migrating in and out of the field of agriculture. Our results has also demonstrated that if income was to increase in the nonagricultural sector, then the total number of minority farmers would decrease due to better income opportunities. Our results also indicates that if more people were employed the nonagricultural sector, than minority farmers would also decrease because of the assumption of better job opportunities. The final conclusion was the impact of price of cotton. We tested six crops along with the leading crop in the Southern states, which was cotton. We found that the price of cotton had a statistically significant impact on the migration of minority labor out of agriculture in the Southern region.



## 6.1 Implications

Cotton is produced globally, and one of the most important textile fibers in the world, including in China and India. Our results demonstrated that if the prices of cotton were to increase, then the number of minority farmers in the American South would increase. This analysis was a good indicator that the impact of international trade could have a strong effect on the determinants of minority farmers migration out of agriculture. However, this statement is not only a statistical result in our research, previous researchers have shown that the correlation across borders concerning trade and income were positive. Historically, the United States Department of Agriculture and other Agriculture Extension Agencies have made several attempts to make the field of agriculture as attractive as possible to minority farmers, along with a few trial and errors. Agriculture Secretary Ann M. Veneman stated on September 3, 2003 in Washington, D.C.:

“We are committed to helping the nation’s minority and disadvantaged farmers...

The grants will help many farmers and ranchers to successfully acquire, own, operate and retain farms and ranches by delivering a wide range of outreach and assistance activities including farm management, financial management and marketing.”

However, trade agreements results are likely to be the opposite of this stated policy. Therefore, our research results indicate that globalization and international trade agreements may be at cross-purposes with other public policies intended to support minority farmers.

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