

AN ANALYSIS OF FARM DIVERSITY IN THE U.S. USING THE 2002 AGRICULTURAL
RESOURCE MANAGEMENT SURVEY

by

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(Under the Direction of Lewell F. Gunter)

ABSTRACT

Farms today vary by size, type, organization, and concentration of production. The result is a very diverse farm sector. The farm resource regions provide a framework for analyzing regional diversity among farms, farmers, and households; and for identifying economic differences across regions. The primary purpose of this study is to analyze and evaluate the diversity within and across regions from a geographic perspective. Household income data, characteristics of the farm business, and the relative importance of international trade and U.S. government support to each farm resource region are analyzed to assess the diversity of farms. Some of the conclusions drawn from the analysis include: income averages were not very different across regions, there appeared to be large differences between levels of income for different farm typologies within regions, and diversity related to the importance of trade and government support was found to exist across farm resource region.

INDEX WORDS: farm resource regions, typology groups, farm diversity, policy, government payments, farm income, international trade, agricultural resource management survey

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DEDICATION

This study is dedicated to the memory of my aunt, Joyce Mae Rhodes (January 31, 1944 to November 3, 2003). Her support and encouragement during my first year of graduate school was a strong motivation in the completion of this study. She never missed a week calling to check on me. Her support was deeply appreciated, and she is truly missed. I love you forever Aunt Joyce.

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CHAPTER I

INTRODUCTION

As our nation has grown and changed, so has the structure of our farms. Farming today consists of a wide variety of farms growing various crops and livestock products (USDA, 2001). These farms vary by size, type, organization, and concentration of production, as well as by, many other aspects. The result is a very diverse farm sector, which is often determined by differences in resources and climatic traits.

Soil, water, and climate differ across geographic regions and affect the type of commodities produced in a region (USDA, 2001). For this reason, the Economic Research Service constructed nine new farm resource regions that cross state boundaries and are more homogenous with regard to resource and production activities (USDA, ERS) than state boundaries. These regions present a framework for analyzing regional diversity in farms, farmers, and households; and for identifying economic differences across regions. The new farm resource regions are comprised of the Heartland, Eastern Uplands, Fruitful Rim, Northern Crescent, Southern Seaboard, Northern Great Plains, Mississippi Portal, Prairie Gateway, and Basin and Range (Figure 1).

In addition to constructing the new farm resource regions, the Economic Research Service also categorized farms into typology groups, which further demonstrate the diversity of the American farm. The typology groups consist of limited resource, retirement, residential/lifestyle, farming occupation/low sales, farming occupation/high

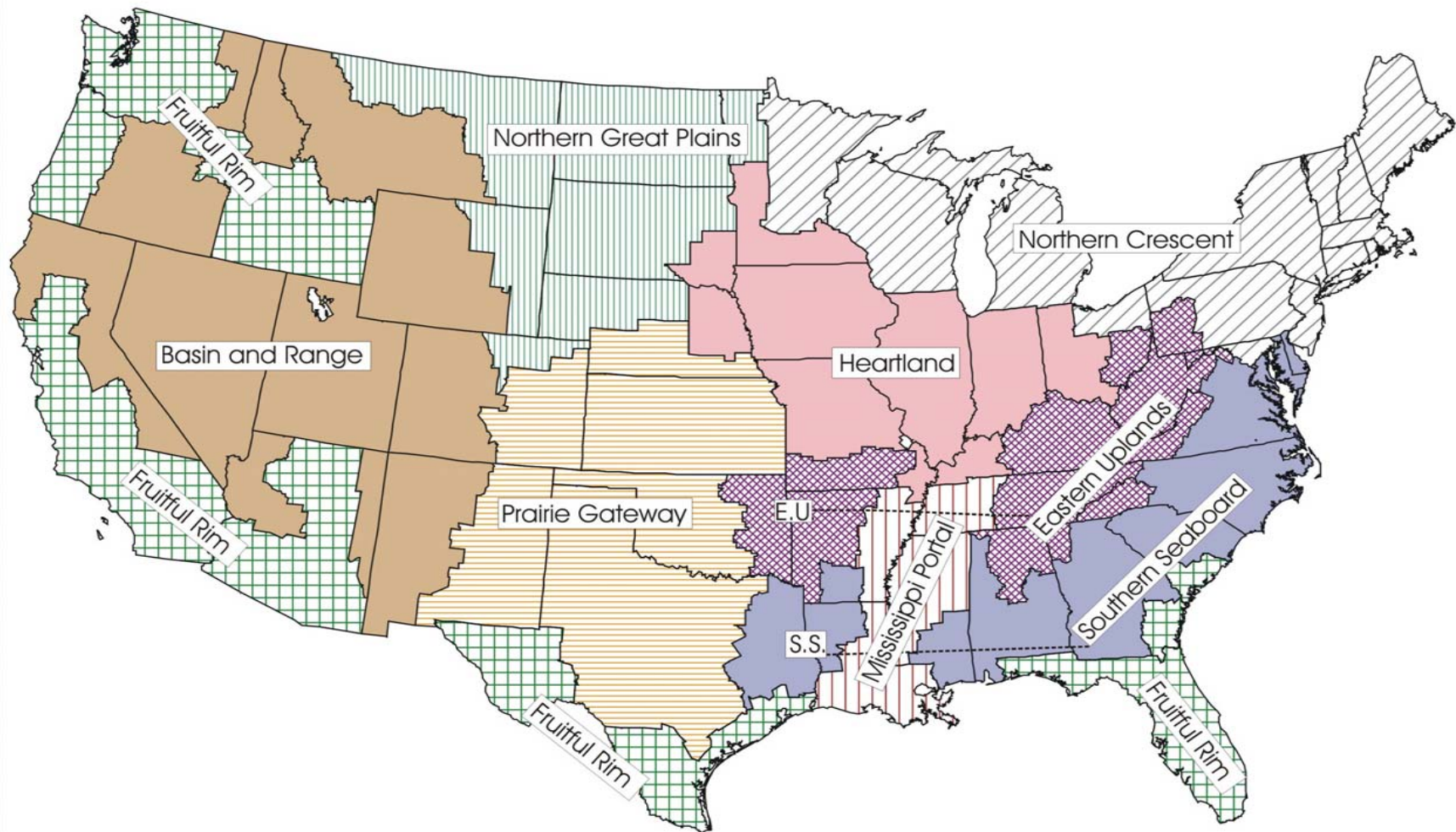


Figure 1.1 Economic Research Service Farm Resource Regions

sales, large family farms, very large family farms, and non-family farms. These groupings reveal key differences in commodity specialization, income sources, and the use of government payments (USDA, 2001). Furthermore, this type of grouping allows for more insight about the operator's expectations from farming and dependence on agriculture (Hoppe, Perry, Banker).

The heterogeneity of the farm sector today vividly illustrates possible weaknesses in a "one policy fits all" approach to agricultural policy. The various differences in farms make it difficult to construct any single policy that benefits every type of farm, and larger farms often reap the majority of benefits from current commodity oriented programs (USDA, 2001). For example, in 1999 commercial farms accounted for 8 percent of all farms, and received forty-seven percent of all government payments, while rural residence farms accounted for 62 percent of all farms but received thirteen percent of all government payments, and intermediate farms accounted for 30 percent of all farms and received forty percent (USDA, 2001).

Statement of the Problem

Size, commodities produced, business organization, income, and value of production all characterize dimensions of farm structure. Various studies using data from the Agricultural Resource Management Survey clearly illustrate a picture of diversity between farm resource regions. While the regions are diverse, farms and farmers located in each region are different as well. For instance, the 2001 Family Farm Report shows that 34.7% of high sales farms are located in the Heartland, whereas only 2.4% of these farms can be found in the Mississippi Portal (Hoppe, 2001). Furthermore, high-sales farms are not evenly dispersed across regions. In fact, 67% of high sales farms are concentrated in the Heartland, the Northern Crescent, and the Northern Great Plains (Hoppe, 2001).

There are countless examples such as this that clearly demonstrate regional diversity, but also show how some farmers could very possibly be left behind. For instance, off farm income has become increasingly important to many farmers, but perhaps most to rural residence farmers. These farmers depend heavily on off farm work to survive, but often live in rural areas where non-farming occupations are scarce (USDA, 2001). Off farm income is important to intermediate farmers as well, but its importance is less to commercial farmers, who produce large quantities of product and receive the majority of government payments.

Day after day some farmers struggle to survive the financial hardships that have come their way, while other farmers are doing exceptionally well. This discrepancy across farms reflects structural transformations in American agriculture (Gebremedhin, Christy). Identifying and understanding the structural changes that have taken place in American agriculture and regional diversity across the U.S. is important in designing meaningful policy goals and effective agricultural policies..

Objectives

The main purpose of this study is to analyze and evaluate the diversity of farms from a geographic perspective. The newly created farm resource regions will be used as our geographic units for the study of diversity within and across regions. Specific objectives of the study are:

- 1) To assess diversity of farms by examining household income data for each farm resource region from off-farm activities, farming activities, and government payments;
- 2) To assess the diversity of farms by evaluating characteristics of the farm business including: distribution of farms by farm commodity type, percentage of regional agricultural income derived from each major commodity, and distribution of farms by the percentage of value derived from each major commodity;

- 3) To examine differences in the farm resource regions related to the importance of international trade and U.S. government support to the most important commodities produced in each region.

Organization of Thesis

The following chapter reviews concepts of farm structure; factors that have influenced farm structure, and research on the impact of structural changes in American agriculture. This chapter also introduces and briefly describes the Agricultural Resource Management Survey. Chapters three and four use data from the Agricultural Resource Management Survey to analyze income data for farm households. Specifically, chapter three examines household income data for each region from off-farm activities, farming activities, and government payments. Chapter four identifies important farm commodity types for each region and analyzes the value of production from each important commodity. Chapter five examines differences in the farm resource regions related to the importance of international trade and U.S. government subsidies to the producers of the most important commodities produced in each region, and the final chapter reveals the overall results, conclusion, and implications of the study.

CHAPTER II

REVIEW OF LITERATURE

Structure of Agriculture

Hoppe and Banker (2002) of the Economic Research Service found farm structure to be comprised of the following components: number and size of farms, concentration of production, specialization and diversification, tenure, farm organization, contracting, operator characteristics, and operator household characteristics. They also noted that farm structure is affected by a variety of forces including production technology, government policy, and research policy (Hoppe, Banker, 2002). There have been prior efforts to explain and discuss farm structural changes by Gebremedhim and Christy (1996); Hallam (1993); Hoppe (2001); Knutson, Penn, and Boehm (1990); and Ahearn, Yee and Huffman (2002). The United States Department of Agriculture's publication, *Food and Agricultural Policy, Taking Stock for the New Century* has also made a recent contribution that is highly relevant to this study.

Gebremedhim and Christy (1996) used data from the U.S. Census of agriculture to identify implications for the small farm in a changing agricultural structure. They identified several forces that have shaped the structure of agriculture. Those forces include technology and resource endowment, farm credit financing, farm input prices, market structure and activities, non-farm income and employment, and research and extension services. In assessing the structure of agriculture, they recognized size, income derivation, and age of operator, full-time or part-time status, and other operator characteristics as dimensions of agricultural structure. They

found that just as farms as a whole are diverse, so are small farms; and for numerous small farm families social welfare programs are more beneficial than farming or farm programs.

Hoppe (2001) identified other dimensions of farm structure as he examined farm businesses, farm operators, and farm households to enhance the description of current farm structure. He opted to use Boehlje's definition of structure which defines the term along five dimensions: (1) size of farm; (2) technology and production characteristics of the firm, including type of activity and level of specialization; (3) characterization of the workforce, including age, education, experience, skill level, part-time versus full-time status; (4) resource ownership and financing patterns, including tenancy, leasing, and debt/equity sources and relationships; (5) inter- and intra-sector linkages. Hoppe found that large and very large, and high sales farms often specialize in specific commodities. He also concluded that large and very large family farms are viable economical units; whereas, limited resource, retirement, residential/lifestyle, and low sales farms are not.

Ahearn, Yee, and Huffman (2002) identified the distribution of the size of farms, production issues, organizational issues, the dependence of the farm household on off-farm income, and the change in the number of farms as indicators of farm structural change. They used these indicators to better understand the relationships between how U.S. farms produce agricultural products and the structure of agricultural production activities. These indicators were also used to help the authors better understand how public policy affects structure. They found that government policies such as public research and extension, investments in highway infrastructure, and commodity programs significantly affect structure. They also found limited information on how the structure of agriculture was affected by public research and extension, and found that commodity programs such as government payments do affect agricultural

structure. Particularly, in the short run, government payments cause farm numbers to increase, but in the long run, the numbers decrease (Yee, Huffman, Ahearn 2002).

The objective of the USDA's *Food and Agricultural Policy, Taking Stock for the New Century* (USDA, 2001) was to prepare a long term view of the country's agriculture and food system, and to provide suggestions to help guide efforts to meet the needs of the future. This publication identified size, specialization, production methods, type and value of commodities produced, technology used, resource endowment, and financial status of the operator as structural characteristics of the farm. The article reported that current program benefits are still largely directed to specific commodity producers, resulting in only 40% of farms being recipients. Furthermore, 47% of these payments went to commercial farmers, while limited resource groups received less than 1%. The authors noted that the 1996 Farm Bill made progress toward greater market orientation, but the subsequent 2002 Farm Bill has since been criticized for reversing this progress. *Taking Stock for the New Century* called for policy improvements to support sustainable income for farmers, agriculture, and rural communities without causing long-term dependence on direct government payments (USDA, 2001).

Knutson, Penn, and Boehm's (1990) main focus was to define the family farm, then to summarize the sources of economic and social concern about farm sector structure in chapter eleven of Agricultural Food and Policy. To conclude the chapter, they concentrated on policies influencing structure including domestic farm policy, marketing policies, and tax policies. The authors identify issues related to concentration of production, concentration in purchased inputs, and concentration in farm product markets, efficiency, vertical integration, contract integration, and ownership integration as economic concerns about the structure of agriculture. They concluded that as agriculture moves toward an integrated industrialized structure, government

policies tend to put the larger farmers in a better position to grow and expand than the smaller farmers (the larger the farmer the greater the benefits). However, at the same time, there are few policies intended to stop this trend, but movement towards agricultural integration constantly puts the ability of the family farm to survive in question. For that reason, structure will always be a policy issue.

Hallam provides information on the changing structure of U.S. agriculture, increases understanding of the factors leading to structural change, and gives insight into the potential future structure of agriculture. He identified seven dimensions of farm structure which include (1) organization of resources, (2) organization, (3) size, management and operation, (4) degree of freedom, (5) ease of entry into farming, (6) restrictions on land use, and (7) extent of ownership of farm resources. Hallam failed to find significant reasons why some farmers are more successful than others. However, Hallam did conclude that unless the definition of a farm, which is any business that sells at least \$1,000 worth of product annually, is changed, it is likely that the proportions of farms selling less than \$20,000 of agricultural products will increase, farms with sales between \$20,000-\$39,999 will continue to decline, and the farms with sales greater than 1,000,000 will continue to increase.

Agricultural Resource Management Survey

The United States Department of Agriculture's main source of information regarding the economic well-being and financial condition of farm households in the United States is the Agricultural Resource Management Survey (ARMS). ARMS is an annual, state survey that began in 1996 as a result of merging the Farms Costs and Returns Survey and the Cropping Practices Survey. By combining these surveys, ARMS provides the USDA with essential information regarding field crop chemical use, nutrient and pest management practices, status of

farmers' finances, production practices for specific commodities, and the economic well being of the household (Morehart, 2003).

The Agricultural Resource Management Survey provides key information for the USDA and is critical to the research and analysis of the Economic Research Service. As a result of ARMS data, the Economic Research Service gains information on the farms participation in agricultural programs, the structure and organization of farms, farm use of credit, and farmers' participation in off-farm employment (Morehart, 2003).

There are three phases needed to conduct the ARMS survey, which is conducted from June to April each year. The first phase is conducted during the summer, where selected farmers are screened to verify their operating status and to determine whether they are producing commodities targeted that year for data collection. The second phase, which replaced the former Cropping Practices Survey, is conducted in the fall and winter. During this phase, farmers from phase I are interviewed to collect information on their production practices and chemical use. Data that was collected in the former Farm Costs and Returns Survey is now collected in the final phase of ARMS, which is conducted in the spring of the following year. In this phase, trained enumerators interview a nationally representative sample of farmers. The enumerators conduct personal interviews to obtain information on their costs and returns during the previous year (Morehart, 2003).

Content of the ARMS data varies for Phase II and Phase III. Data collected in Phase II includes information about the practices used to grow the crop at the field level such as soil, management practices, previous crops, yield characteristics, seed type, sowing rate, and cost. Use of crop insurance, irrigation water application, and drying cost and methods are additional information included in Phase II. Phase III of the survey includes details such as crop use,

tenure, rental arrangements, production, and program participation. Sources of income coming to the farm is also recorded at this level. These sources include receipts from crop and livestock sales, production contracts, and government payments. Farm business expenses are also collected in phase III. This data includes operating expenses such as hired labor, maintenance and repairs, and utilities; and capital expenses such as purchase of machinery, breeding stock, and land improvements. Additionally, farm business financial data and farm household data is collected in phase III. Farm business financial data includes information on assets used in the farm operation, liabilities incurred while operating the farm business, and the owners of production resources. Farm Household data collected includes non-farm household income, which includes the household's share of net farm income and the household's share of farm business net worth (Morehart, 2003).

U.S. farms in forty-eight states are surveyed for the Agricultural Resource Management Survey each year. Farm coverage data is collected annually, whereas commodity specific data is collected on a rotating basis in the whole farm and field level portions of the survey. All establishments that sold or would have sold at least \$1,000 of agricultural products during the year is the farm population that is considered in the farm coverage section of the survey. Approximately every three years, production practice data for corn, soybeans, wheat, cotton, dairy, pork, and beef, which are considered major crops and livestock, are collected. Commodities such as rice, feed, grains, and poultry are covered less often (Morehart, 2003).

There are multiple uses for the data provided by the Agricultural Resource Management Survey. For instance, ARMS data appears in analysis, research monographs, and numerous Economic Research Services' research publications. Data from the ARMS is used by various agencies of the United States Department of Agriculture. The Agricultural Marketing Service

uses ARMS in deriving its monthly cost of production estimates for milk, the Farm Service Agency uses the annual burley and flue-cured tobacco cost of production estimates to help set price support levels for tobacco, and the Agricultural Research Service has used ARMS to gain a better understanding of the structural and production characteristics of farms (Morehart, 2003).

CHAPTER III

ANALYSIS OF HOUSEHOLD INCOME DATA

Household income is an integral part of the overall financial condition of the farm. Since the regions are diverse, household income levels and distributions may differ as well. Knowledge of income levels and distributions could aid in illuminating possible differences of farms from region to region. For that reason, this chapter will examine diversity within and across the farm resource regions by analyzing farm household data.

This chapter will examine household income data for each region from off farm activities, farming activities, and government payments as an attempt to provide a clearer picture of farm family income sources and levels. All data discussed in this chapter are from the 2002 Agricultural Resource Management Survey. Four measures of income for farm households will be evaluated in this chapter. These measures of income include: total household income, farm related household income, off-farm income, and government payments. For the purpose of this chapter, the eight-farm typology groups of the Economic Research Service have been narrowed to four groups to more compactly display the differences in income distributions and levels of farms across regions. Limited resource, retirement, and residential lifestyle farms were combined to form the rural residence typology group. Low sales and high sales intermediate family farms were combined to form the intermediate typology group, and large and very large family farms were combined to form the commercial family farm typology group. The last typology group is the commercial non-family group.

A multiple comparison procedure was used to perform pairwise comparisons between the regional means of total household income, household farm income, off-farm income, and government payments for intermediate and commercial family farms. Multiple comparison procedures are also referred to as multiple separation tests. These tests give more detailed information about the differences among the income means, look at each pair of income means, and take into account all of the information from the other regions' means. The goal of multiple separation tests is to compare the average effect of three or more "treatments". The treatments in this study are the farm resource regions. This method of performing pairwise comparisons was implemented in SAS by using an LSMeans statement in the general linear model procedure, which offers comparisons between all pairs of the income means. Furthermore, to make the strongest possible inferences for all pairwise comparisons, a Tukey test was used. The Tukey test is a statistical method that produces simultaneous confidence intervals for the pairwise differences of the income means across all regions. This test is based on the studentized range of the treatment means, which is a measure of how far apart the largest and smallest treatment means are. The pdiff statement was also used in our implementation of this procedure. This statement requests that p-values for the differences of the LSMeans be produced. Once the p-values were produced, they were found to be either greater than or less than the significant levels. If the p-value was less than the significant level, the pair of income means was found to be significantly different. In contrast, if the p-value was greater than the significant level, the pair of income means was found not to be significantly different.

Farm Typology Distribution by Region

Table 3.1 shows farm distributions by our four typology groups for each resource region. Rural residence farms are defined as farms with gross sales below \$250,000 where farming is considered a secondary activity both in terms of resources invested in the farm and the amount of income it contributes to the farm household. The majority of farms in the United States are rural residence farms. It can be seen in Table 3.1 that these farms account for the highest typology percentage in every region, except the Northern Great Plains. Commercial non-family farms, which are defined as farms organized as non-family corporations or operated by a hired manager with sales above \$250,000, account for the lowest percentages of American farms.

Intermediate farms have sales below \$250,000, and the operator reports farming as his major occupation. Intermediate farms account for a low of 19.3 percent of farms in the Mississippi Portal to a high of 43.4 percent of farms in the Northern Great Plains. Commercial family farms, which are defined as family farms with sales above \$250,000, account for 2.6 percent of farms in the Eastern Uplands to 12.1% of farms in the Northern Great Plains.

The Heartland has the most farms of any region and accounted for 245,643 rural residence farms, 146,497 intermediate farms, 42,518 commercial family farms; and 12,904 commercial non-family farms in 2002. The Mississippi Portal, Basin and Range, and Northern Great Plains were the smallest regions in terms of total number of farms, with about 90,000 farms in each of those regions.

Table 3.1 Farm Distribution by Combined Typology for Each Resource Region

	NUMBER OF FARMS					PERCENTAGE OF FARMS			
Region	Rural Residence	Intermediate Farms	Com. Family	Com. Non-fam.	Total Farms	Rural Residence	Intermediate Farms	Commer. Family	Commer. Non-fam
Heartland	245,643	146,497	42,518	12,904	447,562	54.9	32.7	9.5	2.9
Northern Crescent	180,301	102,515	19,765	4,389	306,970	58.7	33.4	6.4	1.4
N. Great Plains	39,171	40,378	11,213	2,253	93,015	42.1	43.4	12.1	2.4
Prairie Gateway	195,696	86,806	15,247	4,035	301,784	64.8	28.8	5.1	1.3
Eastern Uplands	245,062	72,424	8,611	1,532	327,629	74.8	22.1	2.6	.5
Southern Seaboard	166,317	51,793	18,588	1,172	237,870	69.9	21.8	7.8	.5
Fruitful Rim	160,172	68,467	21,626	9,302	259,567	61.7	26.4	8.3	3.6
Basin & Range	57,260	25,212	4,768	1,364	88,604	64.6	28.5	5.4	1.5
Mississippi Portal	63,247	17,228	8,286	632	89,393	70.8	19.3	9.3	.7

Total Household Income

Total household income is the total income received by a household including income received from farming activities and from non-farming activities. Table 3.2 and Figure 3.1 show the estimated average total household income for the typology groups across each region in 2002. The column labeled “primary farms” in Table 3.2 aggregates intermediate and commercial family farms, and the average income reported for this group is a weighed average of these two farm types. The U.S. Census Bureau’s estimated mean household income for all households in the U.S was \$57,852 in 2002 (U.S. Census Bureau).

In terms of average total household income, the table shows that the Fruitful Rim had the highest income in 2002 with an average total household income across all farm types of \$94,091. The Basin and Range and Prairie Gateway regions had the next highest average total household incomes across the regions. Both of these regions had an income of over \$70,000. The regions with the lowest average total household incomes were the Eastern Uplands, Northern Crescent, and the Northern Great Plains with average incomes between \$50,000 and \$60,000. The Fruitful Rim had the highest average total household income across rural residence farms of \$91,237, and the Eastern Uplands had the lowest average of almost 53,000. The Prairie Gateway had the highest average total household income across all intermediate farms of \$73,839, and the Northern Great Plains had the lowest average of \$41,279. The Fruitful Rim also has the highest average total household income across commercial family farms of \$209,894, while the Eastern Uplands has the lowest average of around \$67,000.

Table 3.2 Average Total Household Income Values for Farms by Combined Typology Groups, 2002**

Farm Typology Groupings					
Region	Rural Residence	Intermediate	Commercial Family	Primary Farms*	All Farms
Heartland	61,358	48,083	87,340	56,914	59,426
Northern Crescent	58,580	42,123	114,157	53,767	56,635
N. Great Plains	58,312	41,279	113,025	56,874	57,494
Prairie Gateway	70,901	73,839	99,808	77,719	72,329
Eastern Uplands	52,970	60,222	67,319	60,977	54,960
Southern Seaboard	65,037	56,868	85,286	64,374	64,840
Fruitful Rim	91,237	64,189	209,894	99,165	94,091
Basin & Range	75,381	57,945	192,080	79,279	76,720
Mississippi Portal	56,278	47,691	142,526	78,491	62,664

* Primary Farms aggregate intermediate and commercial family farms

Intermediate Farms: Pairwise significant differences in the means

Prairie Gateway: Heartland³, Northern Great Plains³, Northern Crescent³

Northern Crescent: Fruitful Rim²

Commercial Farms: Pairwise significant differences in the means

Northern Crescent: Fruitful Rim³

Northern Great Plains: Fruitful Rim³

Mississippi Portal: Fruitful Rim¹

Heartland: Basin & Range³, Fruitful Rim³

Eastern Uplands: Fruitful Rim³, Basin & Range³

Prairie Gateway: Basin & Range², Fruitful Rim³

Southern Seaboard: Basin & Range³, Fruitful Rim³

** 1=significant at the 10% level 2=significant at the 5% level 3=significant at the 1% level

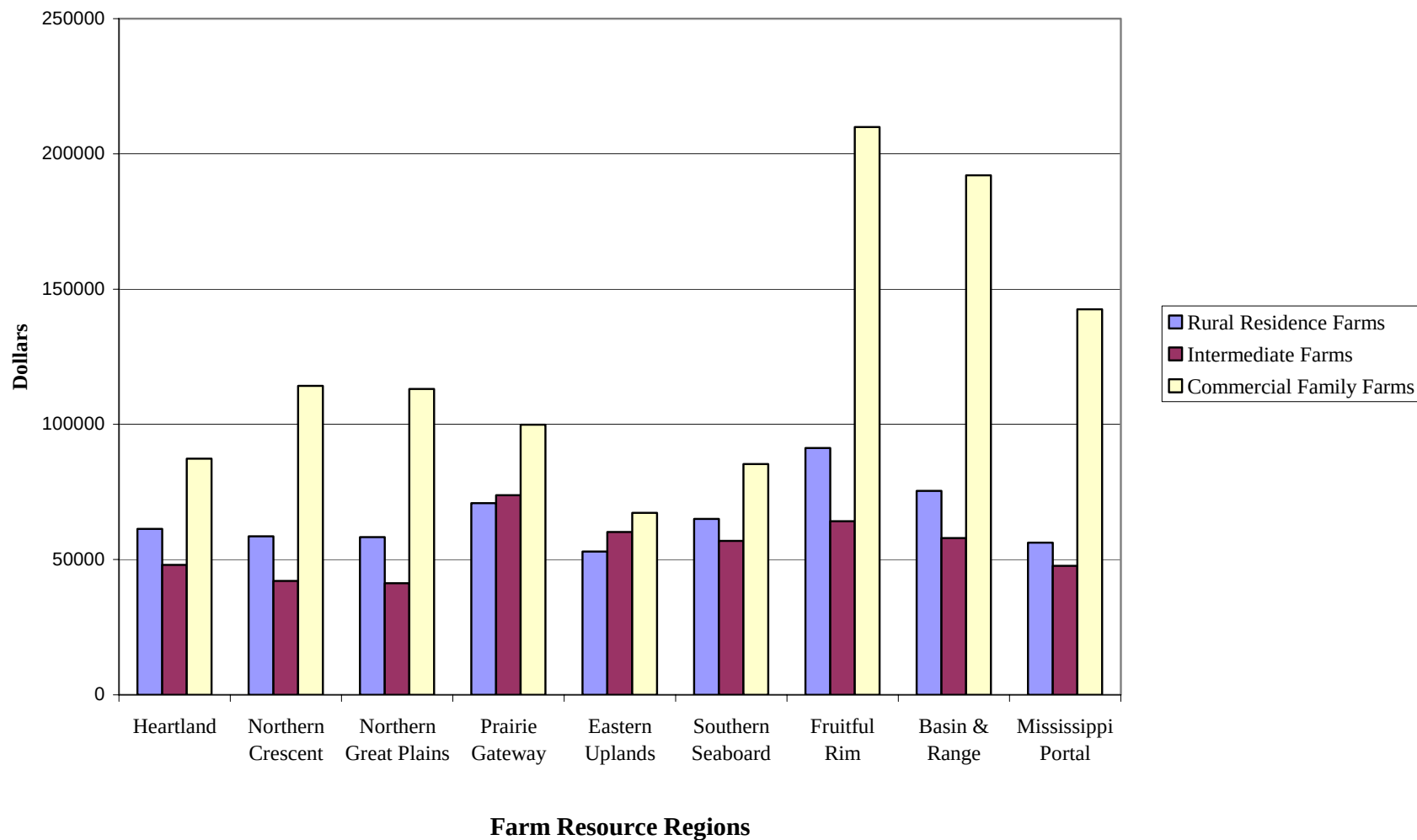


Figure 3.1 Average Total Household Income for Farms by Combined Typology Groups

The statistical test results for the mean average total household income across intermediate farms show that the mean total household income for Prairie Gateway, which had the largest average total household income across the regions, is significantly different from the regions with the smallest average total household incomes in 2002, the Heartland, Northern Great Plains, and the Northern Crescent. The results also show the mean total household income for the Northern Crescent is significantly different from the Fruitful Rim. The Northern Great Plains and the Northern Crescent regions had the smallest average total household incomes across the regions. Across commercial farms, the total household income mean for the Fruitful Rim was significantly different from all of the other regions except the Basin and Range region. The Fruitful Rim had the largest average total household income across commercial farms in 2002, and the Basin and Range and the second highest income.

Table 3.3 shows the distribution of intermediate and commercial family farms in each region by total household income classes. We have dropped the rural residence farms for this table in order to focus only on those family farms where farming is the primary activity on the farm. This table reveals that the Fruitful Rim has the highest percentage of farms receiving over \$200,000 of total household income at 12.1 percent. The Basin and Range and Mississippi Portal also had relatively high percentages of farms to receive over \$200,000 of total household income in 2002. About 10 percent of farms in these regions received over \$200,000. The Heartland, Northern Crescent, and Eastern Uplands have the lowest percentages in this class at 4.6, 4.5, and 3.5 percent respectively.

In the negative total household income class the Northern Great Plains had the largest percentage of farms to have a negative total household income. Negative total

Table 3.3. Percentage Distribution of Intermediate and Commercial Family Farms by Total Household Income

Total Household Income								
Region	Less than 0	0 to 30k	30k to 60k	60k to 100k	100k to 200k	More than 200k	Cumulative % <30k	Cumulative % <60k
Heartland	12.4	23.3	25.6	21.1	13.0	4.6	35.7	61.3
Northern Crescent	13.5	28.3	27.1	18.2	8.4	4.5	41.8	68.8
Northern Great Plains	15.5	22.8	21.4	23.2	11.0	6.1	38.3	59.7
Prairie Gateway	13.3	21.6	32.2	16.1	9.4	7.3	34.9	67.2
Eastern Uplands	8.5	32.3	26.0	18.8	10.9	3.5	40.8	66.9
Southern Seaboard	11.0	25.9	20.4	21.2	14.4	7.0	36.9	57.4
Fruitful Rim	11.9	20.2	21.1	15.8	18.9	12.1	32.1	53.3
Basin & Range	12.7	22.5	19.2	14.8	20.1	10.7	35.2	54.4
Mississippi Portal	11.8	23.2	20.9	16.8	17.3	10.0	35.0	56.0

Table 3.4. Average Total Household Income for Intermediate and Commercial Family Farms by Income Class

Total Household Income						
Region	Less than 0	0 to 30k	30k to 60k	60k to 100k	100k to 200k	More than 200k
Heartland	-54,952	17,039	43,378	76,054	138,304	320,088
Northern Crescent	-56,611	16,583	45,188	73,422	136,998	431,677
Northern Great Plains	-60,113	16,050	42,595	76,791	130,682	348,362
Prairie Gateway	-65,968	16,898	43,478	77,712	136,569	598,848
Eastern Uplands	-36,462	17,572	43,159	74,679	140,495	515,196
Southern Seaboard	-60,831	18,189	44,627	77,318	136,866	301,555
Fruitful Rim	-116,919	18,587	44,063	77,204	141,521	505,692
Basin & Range	-73,973	17,012	44,393	79,577	127,137	364,013
Mississippi Portal	-80,722	16,591	44,580	77,423	137,901	380,055

household incomes in the ARMS resulted from reported negative farm income for these households. The Northern Crescent and Prairie Gateway had the next highest percentages of farms to have a negative total household income at about 13 percent. The Eastern Uplands region had the lowest percentage of farms to receive a negative total household income of about 9 percent, but it had the highest percentage of farms in the 0 to 30K class. Over 30 percent of farms in the Eastern Uplands had an average total household income between 0 and \$30,000.

Average total household income for intermediate and commercial family farms across regions can be seen in Table 3.4 by income class. This table is a continuation of the previous table in that it shows the average income figures that coincide with the percentages of Table 3.3. For example, Table 3.3 showed that 12.1 percent of farms in the Fruitful Rim had a total household income over \$200,000. Table 3.4 shows the average income of these households was over a half million dollars per household. The Prairie Gateway had the largest total household income average for the more than \$200,000 class of almost \$600,000. The Eastern Uplands and the Fruitful Rim also has large averages of around \$500,000. The regions with the lowest total household income averages in this income class were the Heartland and the Southern Seaboard. Both of these regions had averages around \$300,000. In the less than 0 income class the Fruitful Rim had the most negative total household income average of \$-116,919. The Basin and Range and Mississippi Portal also had very negative averages for the less than 0 income class. Their averages were \$-73,973 and \$-80,722 respectively.

Household Farm Income

Household farm income is the total income received by the household from farming related activities. Table 3.5 and Figure 3.2 show the average farm income for each typology group across regions. In terms of average farm income, the table shows that the Northern Great Plains and the Fruitful Rim had the highest incomes in 2002, with average household farm incomes across all farm types of \$11,580 and \$11,359 respectively. The Eastern Uplands was the only region to have a negative average household farm income across all farm types with an average of \$-2,254. This table shows that rural residence farms have a negative average household income from farming in all regions, averaging from \$-1,410 in the Northern Great Plains to \$-7,271 in the Basin and Range region. When looking at farm income for intermediate farms, the Heartland had the greatest average income at \$6,956, while the Basin and Range had a negative income, as did the Northern Crescent. For commercial farms, the Eastern Uplands had the lowest average farm income at \$28,419, whereas the Fruitful Rim had the highest income of \$162,429. Furthermore, the range of average farm income for commercial farms across regions appeared to be very widespread in 2002 ranging from \$28,419 to \$162,429.

There were not many statistical differences in the means of average household farm income across the regions for intermediate farms. However, for commercial family farms the results show the mean household farm income for the Fruitful Rim was significantly different from the mean of all of the other regions except the Basin and Range region. The Fruitful Rim and the Basin and Range had the highest average household farm incomes across the regions in 2002.

Table 3.5. Average Household Farm Income Values for Farms by Combined Typology Groups, 2002*

Region	Farm Typology Groupings				
	Rural Residence	Intermediate	Commercial Family	Primary Farms	All Farms
Heartland	-3,379	6,956	55,690	17,919	5,882
Northern Crescent	-6,064	-1,515	79,814	11,631	1,087
N. Great Plains	-1,410	6,407	75,587	21,444	11,580
Prairie Gateway	-3,217	1,863	57,495	10,175	1,373
Eastern Uplands	-4,421	1,435	28,419	4,303	-2,254
Southern Seaboard	-5,191	3,652	42,369	13,878	479
Fruitful Rim	-5,957	4,153	162,429	42,146	11,359
Basin & Range	-7,271	-6,167	159,695	20,212	2,174
Mississippi Portal	-4,720	5,778	94,913	34,727	6,619

Intermediate Farms: Pairwise significant differences in the means

Heartland: Basin & Range¹

Northern Crescent: Heartland²

Commercial Farms: Pairwise significant differences in the means

Eastern Uplands: Basin & Range³

Fruitful Rim: Eastern Uplands³

Mississippi Portal: Fruitful Rim¹

Heartland: Fruitful Rim³, Basin & Range³

Northern Great Plains: Fruitful Rim³, Basin & Range¹

Northern Crescent: Fruitful Rim, Basin & Range¹

Prairie Gateway: Fruitful Rim³, Basin & Range³

Southern Seaboard: Fruitful Rim³, Basin & Range³

* 1=significant at the 10% level 2=significant at the 5% level 3=significant at the 1% level

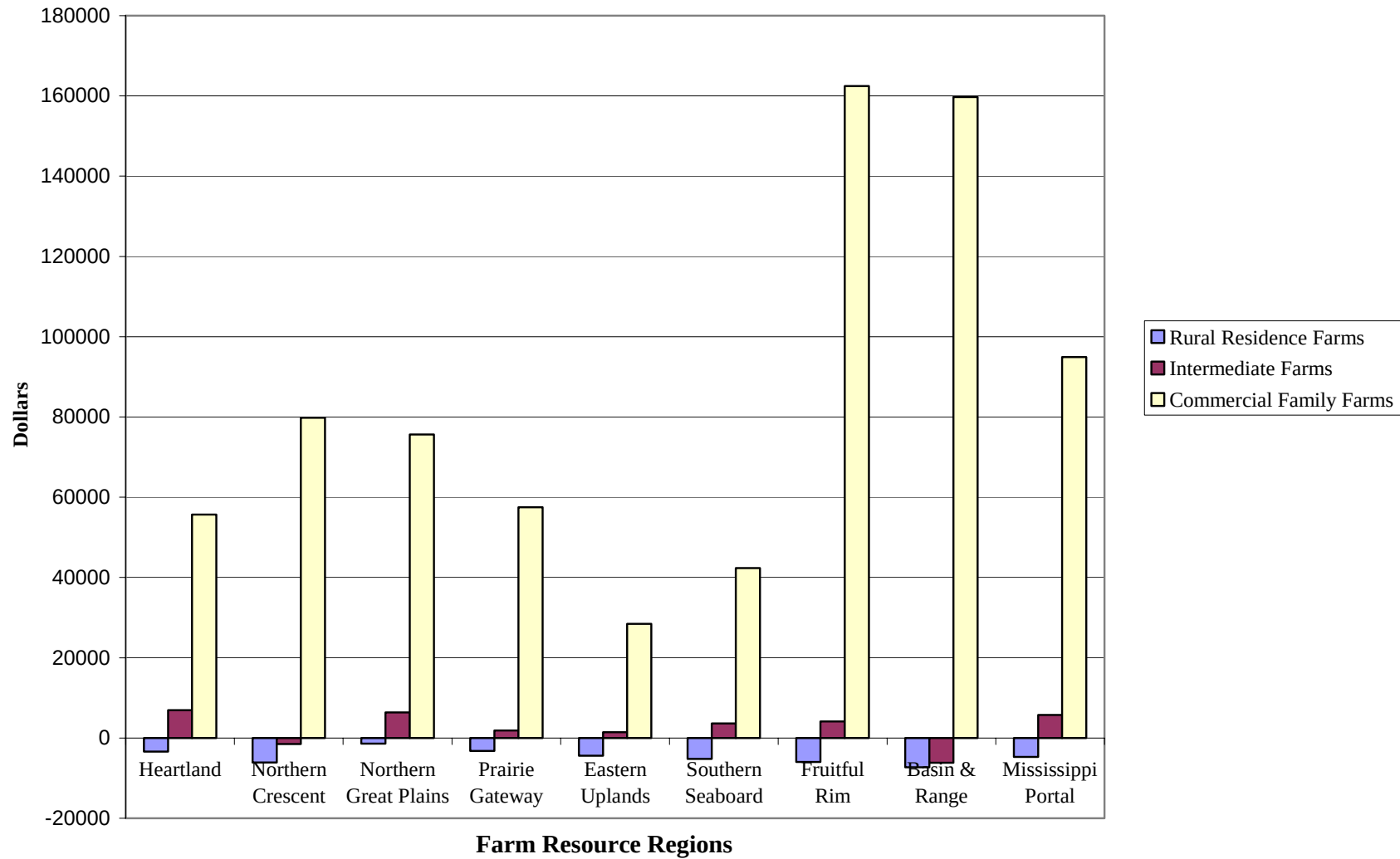


Figure 3.2 Average Household Farm Income for Farms by Combined Typology Groups

The mean household farm income for the Basin and Range was statistically different from the means of the Eastern Uplands, Heartland, Northern Great Plains, Northern Crescent, Prairie Gateway, and the Southern Seaboard. These results are shown after Table 3.5.

Table 3.6 shows the distribution of farms for each region by household farm income. This table shows that the Fruitful Rim has the highest percentage of farms receiving more than \$200,000 of farm income and the Basin and Range and Mississippi Portal regions also have relatively high percentages of farms with household farm income greater than \$200,000. The Eastern Uplands had the lowest percentage of farms to receive more than \$200,000 in farm income in 2002 at .6 percent. The Prairie Gateway and the Basin and Range had over 30 percent of farms lose more than \$10,000 of farm income in 2002, while nearly 30 percent of farms in the Fruitful Rim and Northern Crescent lost over \$10,000. The Southern Seaboard and Mississippi Portal had the lowest percentages of farms to lose more than \$10,000 in 2002 at 19.3 and 20.9 respectively. The Eastern Uplands had the largest percentage of farms to lose 0 to \$10,000 of farm income during the reference year. Over 30 percent of farms in the region lost this amount, and over 20 percent of farms in the Northern Crescent, Prairie Gateway, Southern Seaboard, and Fruitful Rim lost between 0 and \$10,000 of farm income in 2002, while less than 9 percent of farms in the Northern Great Plains lost between 0 and \$10,000 of farm income in 2002. Over 50 percent of farms in the Prairie Gateway, Eastern Uplands, Fruitful Rim, and the Basin and Range had negative household farm income in 2002. These regions had the largest percentage of farms lose income during the reference year, while the Mississippi Portal and Northern Great Plains had the smallest percentage of farms lose income.

Table 3.6 Percentage Distribution of Intermediate and Commercial Family Farms by Household Farm Income

Region	Household Farm Income							
	Lost more than 10k	Lost 0 to 10k	Cumulative % < 0	0 to 30k	30 to 60k	60 to 100k	100 to 200k	More than 200k
Heartland	23.5	17.5	41.0	31.2	10.9	8.5	6.3	2.1
Northern Crescent	26.1	21.6	47.7	30.7	11.1	5.2	3.5	1.8
N. Great Plains	25.0	8.8	33.8	33.0	15.8	9.8	5.0	2.6
Prairie Gateway	30.9	21.6	52.5	25.0	10.6	5.7	3.8	2.4
Eastern Uplands	24.4	30.3	54.7	30.6	8.7	4.5	1.0	.6
Southern Seaboard	19.3	22.5	41.8	34.1	10.8	7.7	3.9	1.8
Fruitful Rim	29.0	23.2	52.2	18.1	10.3	5.5	7.9	6.0
Basin & Range	36.1	17.0	53.1	25.3	7.1	4.6	4.5	5.2
Mississippi Portal	20.9	18.9	39.8	24.9	11.0	10.3	9.3	4.6

Table 3.7 shows the average household farm income for all farms by income class. In the more than \$200,000 income class, the Fruitful Rim, Northern Crescent, and the Eastern Uplands had the highest farm income averages across the region. Fruitful Rim farms in this class had the highest average of over \$675,000, and the Northern Crescent and Eastern Uplands region both had average household farm incomes around \$500,000. The Heartland and Southern Seaboard had the lowest household farm incomes in the highest income class across the region.

In the lost more than \$10,000 income class, the Fruitful Rim, Mississippi Portal, and the Northern Great Plains had the most negative household farm incomes averages of negative \$67,610, \$63,014, and \$60,158 respectively. The Southern Seaboard's household farm income average in this class was \$-59,441, and the Eastern Uplands had the least negative household farm income average in the lowest income class of \$-32,161.

Total Off-Farm Income

Total off farm income is income received by the household from non-farming related activities. Table 3.8 and Figure 3.3 show the average household off-farm income for the typology groups across each region. The Fruitful Rim had the highest income in 2002 in terms of average household off-farm income across all farm types of \$82,732. The Prairie Gateway and the Basin and Range had the next highest average total household off-farm incomes across the regions. Both of these regions had average off-farm incomes over \$70,000. The Northern Great Plains has the lowest average household off-farm income of \$45,914.

The Fruitful Rim had the highest average household off-farm income for rural residence farms of \$97,195. The Northern Great Plains and the Eastern Uplands had average incomes for rural residence farms of less than \$60,000, which were the lowest average incomes across these farms.

Table 3.7. Average Household Farm Income for Intermediate and Commercial Family Farms by Income Class

Household Farm Income							
Region	Lost more than 10k	Lost 0 to 10k	0 to 30k	30 to 60k	60 to 100k	100 to 200k	More than 200k
Heartland	-50,030	-4,576	12,612	41,205	72,860	136,235	344,365
Northern Crescent	-53,270	-4,884	11,886	44,572	79,936	136,529	503,614
Northern Great Plains	-60,158	-4,693	12,699	45,074	78,125	142,197	413,503
Prairie Gateway	-52,710	-5,201	13,078	41,356	76,254	134,667	431,174
Eastern Uplands	-32,161	-5,139	8,605	39,415	73,885	143,221	510,224
Southern Seaboard	-59,441	-5,052	10,771	43,233	77,265	140,619	375,674
Fruitful Rim	-67,610	-3,891	12,596	42,004	79,438	144,304	675,064
Basin & Range	-49,873	-6,392	12,336	43,628	75,929	134,889	450,039
Mississippi Portal	-63,014	-3,757	12,244	41,830	73,530	142,408	436,341

Table 3.8. Average Household Off-Farm Income for Farms by Combined Typology Groups, 2002*

Farm Typology Groupings					
Region	Rural Residence	Intermediate	Commercial Family	Primary Farms	All Farms
Heartland	64,737	41,127	31,649	38,995	53,543
Northern Crescent	64,645	43,638	34,342	42,136	55,548
N. Great Plains	59,723	34,871	37,437	35,430	45,914
Prairie Gateway	74,119	71,976	42,313	67,544	71,866
Eastern Uplands	57,392	58,787	38,900	56,674	57,214
Southern Seaboard	70,229	53,215	42,916	50,496	64,362
Fruitful Rim	97,195	60,035	47,465	57,018	82,732
Basin and Range	82,652	64,112	32,385	59,067	74,547
Mississippi Portal	60,999	41,912	47,613	43,764	56,045

Intermediate Farms: Pairwise significant differences in the means of household off-farm income

Heartland: Eastern Uplands², Fruitful Rim²

Northern Great Plains: Basin & Range¹, Eastern Uplands², Fruitful Rim²

Prairie Gateway: Heartland³, Mississippi Portal¹, Northern Crescent², Northern Great Plains³

* 1=significant at the 10% level

2=significant at the 5% level

3=significant at the 1% level

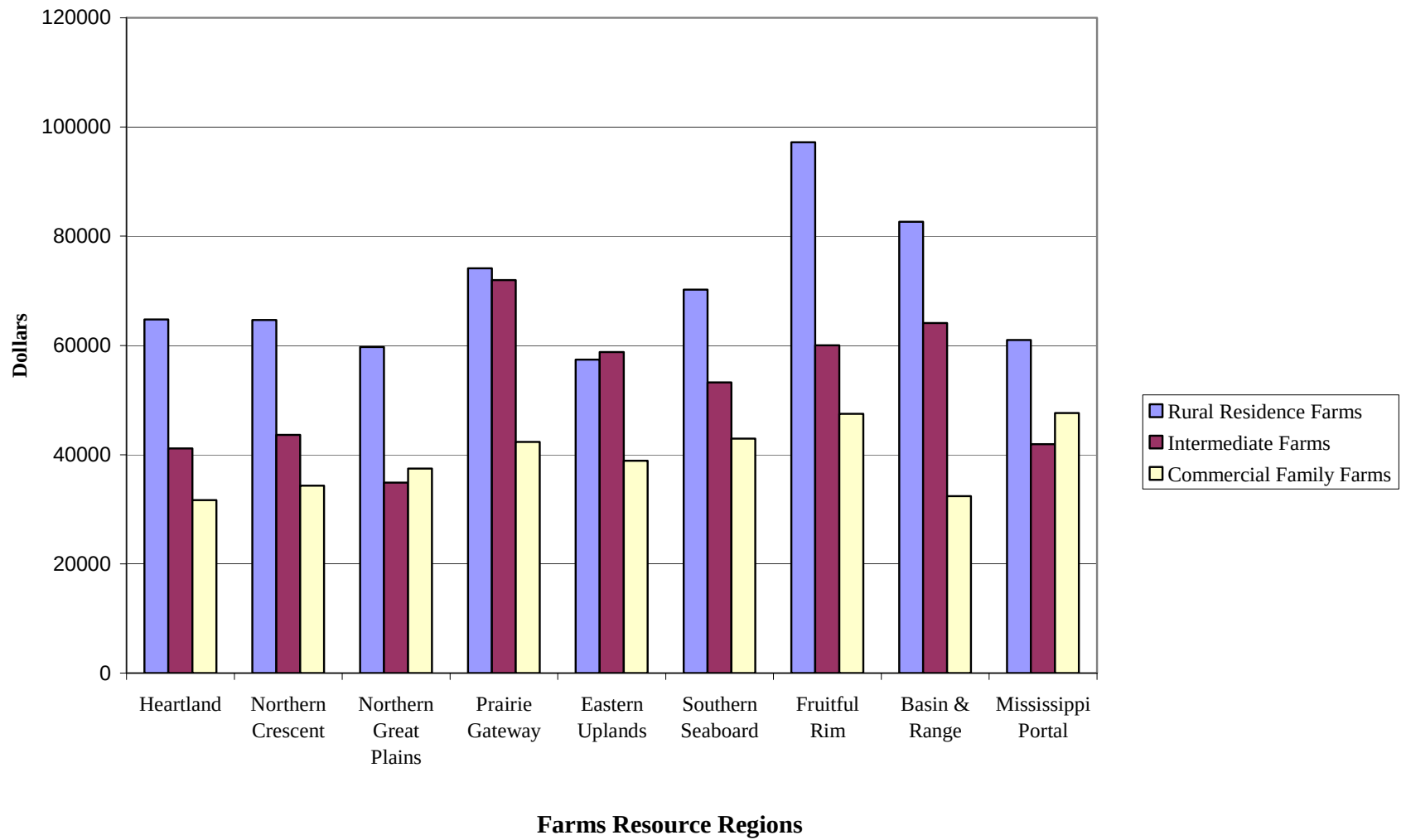


Figure 3.3. Average Household Off-Farm Income for Farms by Combined Typology Groups

The Prairie Gateway had the highest average household off-farm income across intermediate farms of about \$70,000, and the Northern Great Plains had the lowest average of almost \$35,000. The Mississippi Portal and the Fruitful Rim had the highest average household off-farm incomes across all commercial family farms with averages over \$47,000. The Basin and Range, Heartland, and Northern Crescent had the lowest averages across commercial family farms. All three of these regions had average household off-farm incomes less than \$35,000. There were not many statistically significant differences in the means of average household off-farm income across the regions for the intermediate farm category, and there were no statistically significant differences in mean off-farm income of the regions for commercial family farms. The results from the statistical tests are shown after Table 3.8.

Table 3.9 shows the distribution of intermediate and commercial family farms in each region by off-farm household income. This table shows the Basin and Range has the highest percentage of farm receiving over \$200,000 of off-farm household income at almost 23 percent. The Fruitful Rim had the next highest percentage at 17 percent. The Heartland and the Northern Great Plains had the lowest percentages in this class at 6.5 and 5.7 percent respectively. In the zero off-farm income class, the Mississippi Portal had the highest percentage of farms in 2002. Almost 16 percent of the Mississippi Portal's intermediate and commercial farms derived no income from off-farm household activities during the reference year, and around 13 percent of farms in the Fruitful Rim and Basin and Range regions derived no income from off-farm activities. Less than 7 percent of farms in the Heartland, Eastern Uplands, and the Southern Seaboard derived no income from off-farm household activities.

Table 3.9. Percentage Distribution of Intermediate and Commercial Family Farms by Off Farm Household Income

Region	0	0 to 10k	10k to 30k	30k to 60k	60k to 100k	More than 100k
Heartland	6.5	18.6	29.0	26.7	12.6	6.5
Northern Crescent	7.7	20.8	28.6	22.4	11.1	9.3
Northern Great Plains	9.9	21.8	28.2	23.0	11.5	5.7
Prairie Gateway	7.9	10.8	27.3	31.9	12.7	9.3
Eastern Uplands	5.0	11.8	28.0	29.5	14.9	10.8
Southern Seaboard	6.7	12.9	28.0	27.1	13.8	11.5
Fruitful Rim	13.7	11.4	18.0	24.3	15.6	17.0
Basin & Range	13.2	14.3	16.9	18.7	14.0	22.9
Mississippi Portal	15.8	17.6	17.6	26.1	9.5	13.4

Table 3.10 shows the average total off-farm income for intermediate and commercial family farms across all regions. The table shows the Prairie Gateway had the largest total off-farm income average for the more than \$100,000 class with an average over \$400,000. The Eastern Uplands had the next highest average of \$237,463. All of the other regions had averages less than \$200,000 for this income class. In the 0 to \$10,000 income class, the Eastern Uplands and Southern Seaboard had the highest total off-farm income averages of about \$5,000. The Northern Crescent, Northern Great Plains, and the Mississippi Portal had the lowest average total off-farm incomes in this class of \$3,522, \$3,851, and \$3,955.

Average Government Payments

Government payments are a type of financial assistance to farmers, where such factors as farm size and type of commodities produced affect the allocation of these payments. Table 3.11A and Figure 3.4 show the average government payment values for farms by typology groups for all regions. For this section, government payments are not evaluated by the household. Instead, they are evaluated per farm; therefore, commercial non-family farms have been added in this section. Table 3.11A shows for each region the average government payments increase across the family farm typology groups. The average government payments across intermediate farms are larger than the payments across the rural residence farms, and the average government payments across commercial farms are larger than the payments for the intermediate farms. The Mississippi Portal received the largest average government payment across all commercial family and non-family farms with averages of \$71,058 and \$42,389 respectively. Across all rural residence and intermediate farms, the Northern Great Plains received the largest average government payment.

Table 3.10. Average Total Off-Farm Income for Intermediate and Commercial Family Farms by Income Class

OFF FARM INCOME					
Region	0 to 10k	10k to 30k	30k to 60k	60k to 100k	More than 100k
Heartland	4,548	20,857	42,536	76,171	170,312
Northern Crescent	3,522	20,235	43,172	74,943	188,940
Northern Great Plains	3,851	19,883	43,151	78,858	176,313
Prairie Gateway	4,775	20,137	44,469	75,126	406,011
Eastern Uplands	5,263	20,782	45,176	75,840	237,463
Southern Seaboard	5,273	21,374	44,600	83,477	175,621
Fruitful Rim	4,507	20,063	43,715	80,487	174,769
Basin & Range	4,572	20,856	44,034	77,836	156,082
Mississippi Portal	3,955	21,818	45,202	73,512	153,159

Table 3.11A. Average Government Payments for Farms by Combined Typology Groups

Farm Typology Groups				
Region	Rural Residence	Intermediate	Commercial Family	Commercial Non-Family
Heartland	2,429	6,656	24,293	3,675
Northern Crescent	762	5,102	28,693	4,790
N. Great Plains	4,072	12,118	39,169	13,459
Prairie Gateway	1,709	7,976	38,397	16,186
Eastern Uplands	294	1,585	10,528	1,034
Southern Seaboard	1,068	5,222	23,195	23,001
Fruitful Rim	496	2,580	28,040	2,763
Basin & Range	874	5,382	33,670	9,259
Mississippi Portal	1,431	10,730	71,058	42,389

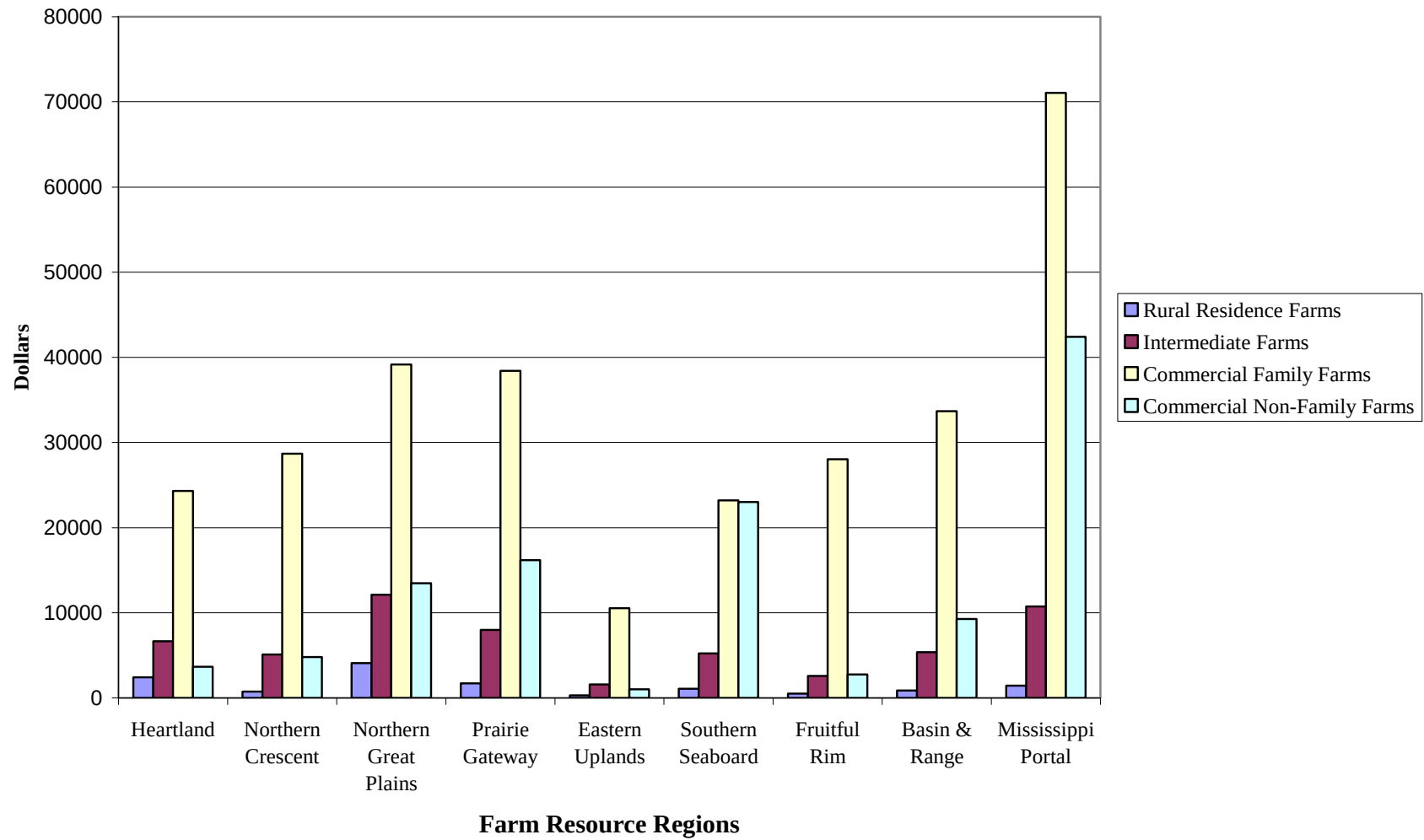


Figure 3.4 Average Government Payments for All Farms by Typology Groups

The Northern Great Plains received an average payment of \$4,072 across all rural residence farms and over \$12,000 across all intermediate farms. The Eastern Uplands received considerably lower average government payments than the other regions for all of the typology groups. Rural residence farms in the Eastern Uplands received an average government payment of only \$294, and the intermediate farms received less than \$2,000. Commercial family and non-family farms in the Eastern Uplands received average government payments of \$10,528 and \$1,034 respectively.

There were many more significant differences found in the government payment means across the regions for intermediate and commercial family farms than were found for any of the measures of household incomes. Therefore, these differences are shown in a separate table. The probabilities that mean government payments are not significantly different between each pair of regions are shown in Table 3.11B. Probability levels are shown only for probability levels of less than 10 percent. The results from the statistical test show across intermediate farms the mean government payments in the Northern Great Plains and Mississippi Portal were statistically different from most of the regions. These two regions received the largest average government payments across intermediate farms in 2002, and the results show that both of the region's government payment means were significantly different from the means of the Eastern Uplands, Heartland, Basin & Range, Fruitful Rim, Northern Crescent, and the Southern Seaboard. On the other hand, the Eastern Uplands received the smallest average government payment for intermediate farms across the region, and the test results show the mean government payment for the region was significantly different from every region except the Fruitful Rim. The Eastern Uplands also received the smallest average government payment across commercial farms, and

Table 3.11B. Probability Levels for Significant Differences of Government Payments Across The Regions¹

Intermediate Farms									
	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin Range	Mississippi Portal
Heartland			<.0001***		<.0001***		<.0001***		.0103**
Northern Crescent			<.0001***	.0004***	<.0001***		.0091***		<.0001***
N. Great Plains	<.0001***	<.0001***		<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	
Prairie Gateway		.0004***	<.0001***			.0132**	<.0001***		
Eastern Uplands	<.0001***	<.0001***	<.0001***	<.0001***		.0003***		.0073***	<.0001***
Southern Seaboard			<.0001***	.0132**	.0003***		.0357**		.0003***
Fruitful Rim	<.0001***	.0091***	<.0001***	<.0001***		.0357**			<.0001***
Basin & Range			<.0001***		.0073***				.0041***
Mississippi Portal	.0103**	<.0001***			<.0001***	.0003***	<.0001***	.0041***	
Commercial Family Farms									
	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin Range	Mississippi Portal
Heartland			<.0001***	<.0001***	.0029***				<.0001***
Northern Crescent			.0712*	.0622*	<.0001***				<.0001***
N. Great Plains	<.0001***	.0712*			<.0001***	.0002***	.0354**		<.0001***
Prairie Gateway	<.0001***	.0622*			<.0001***	.0001***	.0277**		<.0001***
Eastern Uplands	.0029***	<.0001***	<.0001***	<.0001***		.0300**	.0001***	.0006***	<.0001***
Southern Seaboard			.0002***	.0001***	.0300**				<.0001***
Fruitful Rim			.0354**	.0277**	.0001***				<.0001***
Basin & Range					.0006***				<.0001***
Mississippi Portal	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	

¹ The significance levels are denoted by (*), *=10% significance level **=5% significance level ***=1% significance level

the test shows the mean government payment for the Eastern Uplands is significantly different from the mean government payment of every region. Similarly, the Mississippi Portal had the highest average government payment among commercial family farms. Its mean government payment was also significantly different from the mean government payment for each other region.

The average government payment values in Table 3.12 are only for farms that received government payments. Average government payments for recipients are naturally higher than averages calculated across recipients and non-recipients, shown in Table 3.11A. The percentage of farms receiving government payments in each region and typology are shown in parenthesis in Table 3.12. The table shows that the percentage of government payment recipients increased across the family farm typology groups. The percentage of intermediate recipients was larger than rural residence recipients, and the percentage of commercial family recipients was larger than intermediate recipients. The table also shows only 9 percent of rural residence farms in the Fruitful Rim received government payments. This small percentage of recipients is what caused the average government payment for recipients only in Table 3.12 to be much higher than the average payment for all rural residence farms in Table 3.11A. Similarly, in the Basin and Range, 15 percent of rural residence farms in the region received government payments during the reference year and the average payments in Tables 3.11A and 3.12 differ by almost 5,000. Over 60 percent of rural residence farms in the Heartland and Northern Great Plains received government payments. The largest percentage of recipients across rural residence farms were in these two regions.

Only about 20 percent of intermediate farms in the Fruitful Rim received government payments in 2002. This percentage is noticeably lower than the percentages in other regions.

The largest percentage of intermediate farms to receive government payments was in the Northern Great Plains. Over 90 percent of intermediate farms in the region received government payments in the reference year. The largest percentage of commercial family farms to receive government payments was in the Northern Great Plains region. Over 90 percent of commercial family farms in the Northern Great Plains, Heartland, and Prairie Gateway received government payments. The lowest percentage of commercial family farms to receive government payments in 2002 was less than 40 percent in the Eastern Uplands.

Table 3.12 shows the largest percentage of commercial non-family recipients was in the Mississippi Portal. Almost 90 percent of commercial non-family farms in the region, received government payments while the Fruitful Rim had the lowest percentage of commercial non-family farms to receive payments at about 18 percent.

Table 3.13 shows the distribution of intermediate and commercial family farms in each region by government payment classes. The Mississippi Portal had the highest percentage of farms (9.2%) in the more than \$100,000 class, while the other regions had a very small percentage of farms that received more than \$100,000 of government payments. The majority of intermediate and commercial family farms in the Eastern Uplands, Southern Seaboard, and Fruitful Rim did not receive any government payments in 2002, with percentages not receiving payments of 62, 62, and 71 percent respectively. Of the farms that received government payments, many of them received less than 10,000, and a majority of government payment recipients in all regions received less than 30,000 in 2002.

Table 3.12 Average Government Payments for Recipients Only And Percentages of Farms Receiving Payments²

Region	Farm Typology Groupings			
	Rural Residence	Intermediate	Commercial Family	Commercial Non-Family
Heartland	3,920 (62.0)	8,591 (77.5)	25,959 (93.6)	11,683 (31.5)
Northern Crescent	2,295 (33.2)	9,707 (52.6)	41,882 (68.5)	7,665 (62.5)
N. Great Plains	6,594 (61.8)	13,326 (90.9)	41,079 (95.4)	16,936 (79.5)
Prairie Gateway	4,467 (38.3)	11,307 (70.5)	42,545 (90.3)	20,986 (77.1)
Eastern Uplands	1,278 (23.0)	4,179 (37.9)	27,171 (38.7)	2,829 (36.6)
Southern Seaboard	3,459 (30.9)	15,360 (34.0)	48,320 (48.0)	49,763 (46.2)
Fruitful Rim	5,429 (9.1)	11,752 (22.0)	56,516 (49.6)	15,578 (17.7)
Basin & Range	5,848 (15.0)	12,482 (43.1)	46,544 (72.3)	19,262 (48.1)
Mississippi Portal	3,665 (39.0)	19,654 (54.6)	88,422 (80.4)	48,011 (88.3)

² Percentage of farms in each region and typology receiving payments

Table 3.13 Distribution of Intermediate and Commercial Family Farms by Government Payments

Government Payments						
Region	0	0 to 10k	10k to 30k	30k to 60k	60k to 100k	More than 100k
Heartland	18.9	45.5	28.0	5.8	1.4	.4
Northern Crescent	44.9	28.2	19.6	4.6	2.1	.7
Northern Great Plains	8.1	42.5	30.9	13.0	4.8	.7
Prairie Gateway	26.5	37.8	24.1	8.4	1.9	1.2
Eastern Uplands	62.0	32.7	3.4	1.4	.3	.2
Southern Seaboard	62.3	22.5	7.9	2.7	1.6	3.0
Fruitful Rim	71.4	13.8	6.8	4.4	2.0	1.5
Basin & Range	52.2	25.6	10.2	9.3	1.3	1.5
Mississippi Portal	37.0	25.0	11.3	9.5	7.9	9.2

CHAPTER IV

COMMODITIES PRODUCED IN THE FARM RESOURCE REGIONS

To further examine diversity across the regions and across farms, commodities produced will be evaluated in this chapter. The term “value of production,” which is defined as the sum of the cash sales from the commodity and the value of production under contract will be used throughout this chapter in discussions of variables and in the tables. Characteristics that will be analyzed include the percentage of farms specializing in each commodity, the total percentage of the value of production from each commodity across all farms in a region, and the average percentage of the value of production from each commodity across all farms in a region.

All of the regional data used in this chapter are from the 2002 Agricultural Resource Management Survey. The Economic Research Service farm typology groups used in this section include farming occupation/low sales, farming occupation/high sales, large family farms, and very large family farms. This chapter does not include rural residence farms, where farming is not the primary occupation of the farm operator, and non-family farms.

The first section of this chapter shows the distribution of farms in each region by farm type. If fifty percent or more of a farm’s value of production comes from one commodity, it is classified as that farm type.

Seventeen farm types will be introduced in the first section of this chapter; however, only the five farm types with the highest percentage of farms will be discussed for each region. In the second section of this chapter, the total and average percentages of the value of production from each commodity across all farms in the region will be shown, and in the third and final section, the percentage of farms producing a given commodity and the value of production from each commodity will be discussed.

Distribution of Crop Production by Region

Table 4.1 shows the distribution of farms by farm commodity type for each resource region. A farm is classified as commodity type x if 50 percent or more of the total value of production of commodities produced on that farm is from commodity x . There are seventeen farm types used in this distribution including wheat, corn, soybeans, grain sorghum, rice, tobacco, cotton, peanuts, fruits and tree nuts, vegetables, nursery and greenhouse, beef cattle, hogs, poultry, dairy, general cash grains, and other crop and livestock. The top five farm types in each region are displayed in Table 4.1. To calculate the percentage of farms belonging to each farm commodity type, the total number of farms of each type was divided by the total number of farms in each region

In 2002 the Heartland had an estimated 189,016 farms of the intermediate and commercial family farm typologies included here. This is the largest number of farms in any of the Agricultural Resource Management Survey regions. Of these farms, 56,155 are classified as corn farms. Corn farms account for the highest percentage of farms in this region, 29.7 percent. Over fifteen percent of all farms in the Heartland specialize in “general cash grains”, which includes any combination of barley, corn oats, rice, sorghum, soybeans, and wheat, where no individual grain accounts for more than 50 percent of the total production value for the farm.

The “other crop/livestock” farm type has the third highest percentage of farms in the Heartland with 13.6 percent. This farm type includes all farms that are not classified in any of the other single commodity or combined commodity categories, and it accounted for 25,717 of the farms in this region. Beef cattle and soybean farms are the remaining two farm types in the top five types for the Heartland. The top five farm types in the Heartland account for over 80 percent of the farms in this region.

The Northern Crescent region had an estimated 122,281 farms in 2002, of which 34.3 percent were dairy farms. Other crop/livestock, the next grouping, accounted for 23.8 percent of farms in the region. These two categories accounted for over half of Northern Crescent farms. Beef cattle, nursery/greenhouse, and corn farms complete the top five farm types in this region and account for a combined 21 percent of Northern Crescent farms.

The Northern Great Plains region had a significant number of beef cattle farms. This farm type accounts for 43.0 percent of all farms. The top two farm types in the Northern Great Plains, beef cattle, and other crop/livestock, account for 65 percent of farms in this region. Beef cattle also account for the highest percentage of farms in five additional regions: the Prairie Gateway, Eastern Uplands, Southern Seaboard, and Mississippi Portal.

The importance of beef cattle among the farm typologies considered here is clear, since this is the leading commodity farm type in six of the nine resource regions. Wheat, other cash grains, and soybeans complete the top five farm types in the Northern Great Plains, and account for a combined 27 percent of farms in the region.

Table 4.1 Top Five Farm Commodity Types by Region¹

Heartland		Northern Crescent		Northern Great Plains	
Commodity	Percent of Farms	Commodity	Percent of Farms	Commodity	Percent of Farms
Corn	29.7	Dairy	34.3	Beef Cattle	43.0
Other Cash Grains	15.9	Other crop/livestock	23.8	Other crop/livestock	22.4
Other crop/livestock	13.6	Beef Cattle	9.2	Wheat	12.6
Beef Cattle	12.6	Nursery/greenhouse	7.7	Other Cash Grains	10.2
Soybeans	9.5	Corn	5.0	Soybeans	4.4
Total Farms	189,016	Total Farms	122,281	Total Farms	51,591

¹ Farms classified as Farm Type derive over 50 percent of their value of production from commodity

Table 4.1 Top Five Farm Commodity Types by Region

Prairie Gateway		Eastern Uplands		Southern Seaboard	
Commodity	Percent of Farms	Commodity	Percent of Farms	Commodity	Percent of Farms
Beef Cattle	40.2	Beef Cattle	35.9	Beef Cattle	33.8
Other crop/livestock	21.5	Other crop/livestock	22.1	Poultry	21.4
Wheat	9.2	Tobacco	13.9	Other crop/livestock	13.5
Corn	8.3	Poultry	10.2	Tobacco	9.6
Other Cash Grains	8.3	Dairy	6.7	Hogs	5.5
Total	102,054	Total	81,036	Total	70,382

Table 4.1 Top Five Farm Commodity Types by Region

Fruitful Rim		Basin & Range		Mississippi Portal	
Commodity	Percent of Farms	Commodity	Percent of Farms	Commodity	Percent of Farms
Other crop/livestock	27.7	Beef Cattle	43.1	Beef Cattle	23.9
Fruits/Tree Nuts	23.0	Other crop/livestock	35.2	Other crop/livestock	17.1
Beef Cattle	21.8	Wheat	5.4	Soybeans	11.4
Nursery/greenhouse	8.4	Vegetables	4.2	Other Cash Grains	11.1
Dairy	5.0	Hogs	3.3	Cotton	8.6
Total Farms	90,093	Total Farms	29,980	Total Farms	25,514

In the Prairie Gateway, beef cattle account for 40.2 percent of farms, 21.5 percent of farms are other crop/livestock farms, and wheat farms account for 9.2 percent of farms. Other cash grains and corn complete the top five farm types with 8.3 percent each. There are a total of 102,054 farms in the Prairie Gateway.

The Eastern Uplands has a total of 81,036 farms. Beef cattle make up more than one third of all farms in the region with 35.9 percent of farms in the region specializing in beef cattle. The second largest farm type is other crop/livestock which accounts for 22.1 percent of farms, while tobacco accounts for 13.9 percent of farms.

Poultry and dairy farms are the remaining two farm types in the top five farm types for the Eastern Uplands, and account for a combined 17 percent of farms in the region. The top five farm types account for 88 percent of farms in the region.

The Southern Seaboard had an estimated 70,382 intermediate and commercial family farms in 2002. The majority of farms in this region are livestock oriented farms with 33.8 percent specializing in beef cattle, 21.4 percent in poultry, and 5.5 percent in hogs. Together these farm types represent over 60 percent of the farms in this region. Tobacco and other crops/livestock are other important farm types in the Southern Seaboard accounting for 9.6 and 13.5 percent of farms in the region respectively.

The Fruitful Rim has a large number of farms specializing in fruit, beef cattle, and other crop/livestock. There are a total of 90,093 farms located in the region and 27.7 percent of these farms are classified as other crop/livestock farms, while 23.0 percent specialize in fruits, and 21.8 specialize in beef cattle. A unique feature of the Fruitful Rim is that almost a third of the farms specialize in either fruits/tree nuts or nursery/greenhouse.

Beef cattle represent a large number of farms in the Basin and Range region. Over 78 percent of farms in the Basin and Range are either beef cattle (43.1%) or other crop/livestock (35.2%) farms. Other important farm types in this region include wheat (5.4%), vegetables (4.2), and hogs (3.3%).

The Mississippi Portal has an estimated total of 25,514 farms of the farm typologies include here, which is the smallest farm total across all regions. There are 6,088 farms in this region that specialize in beef cattle, which accounts for 23.9 percent of all farms in the region. An additional, 17.1 percent of all farms in this region are classified as other crop/livestock farms. The percentage of farms specializing in soybeans, the third largest farm type in the Mississippi Portal, is 11.4 percent. Other cash grains and cotton are the fourth and fifth largest farm types in this region. They account for 11.1 and 8.6 percent of the farms respectively.

Value of Production Percentages for Each Commodity Grouping

Table 4.2 shows additional measures of the importance of each commodity to each region. The regional percentage column in Table 4.2 shows the percentage of regional agricultural income derived from each commodity, while the farm average percentage column indicates the percentage each commodity contributes to agricultural income, on average, across all farms in the region. The commodities included in Table 4.2 are the five commodities with the highest regional percentages of value of production.

Comparing the regional and farm percentages of value provides insights into the importance and distribution of major commodities in each region. Similar regional and farm value of production percentages for a commodity would be consistent with a relatively even distribution of that commodity across farms and farm sizes. For example if most farms in a region derive 15 to 25 percent of their farm income from cattle, the average percentage of value

produced from cattle per farm would be around 20 percent and the percentage of regional farm income attributable to cattle would be about 20 percent. In contrast, if poultry production in a region were dominated by a relatively small number of large producers specializing in poultry, and most farms had no poultry, the regional percentage of farm income from poultry, which accounts for the large size of poultry farms, would be much larger than the per farm average value of production attributable to poultry which does not account for farm size. A contrasting pattern of a high per farm percentage and a low regional percentage would be consistent with a large number of small farms producing a relatively high percentage of their income from a specified commodity.

In the Heartland in 2002, an estimated 27 percent of the total income from agricultural production came from corn, and the average percentage of value of production per farm from corn was 29.6 percent. More than a fifth of the total agricultural value in the Heartland was from soybeans, and cattle, hogs and “other crops” accounted for about 13 percent each. These top five commodities accounted for almost 90 percent of the value of production in the Heartland. There were no dramatic differences in the regional and farm percentages for the top five commodities in the Heartland.

Around 36 percent of the total income from agricultural production in the Northern Crescent comes from dairy. Nursery and “other crops” combined account for almost 30 percent of the total agricultural value, and approximately 12 percent comes from cattle and vegetables. The top five commodities in the Northern Crescent region account for over 75 percent of the value of agricultural production. There are no dramatic differences in the regional and farm percentages for the top five commodities in the region.

Cattle are the most important commodity in the Northern Great Plains in terms of the percentage of regional agriculture income from the commodity. About 36 percent of the total income from agricultural production comes from cattle, while “other crops” and wheat account for about 15 percent each of total agricultural value in the Northern Great Plains. Other important commodities in this region include soybeans (8%) and dairy (5%). There are no dramatic differences in the regional and farm percentages for the top five commodities in the region.

In the Prairie Gateway, 39 percent of the total income from agricultural production comes from cattle. Almost 63 percent of the total agricultural value in the region comes from cattle, corn, and wheat. Dairy and “other crops” account for approximately 7 percent each. These top five commodities account for approximately 80 percent of the value of agricultural production in the region. There are no dramatic differences in the regional and farm percentages for the top five commodities in the Prairie Gateway.

Poultry accounts for 42 percent of the total income from agricultural production in the Eastern Uplands. Other important commodities in the region include cattle, nursery, dairy, and tobacco which together account for more than 40 percent of the total agricultural value in the region.

Over 80 percent of the value of agricultural production in the Eastern Uplands comes from these top five commodities. There is a large gap between the regional and farm percentage for poultry and cattle in this region. For poultry the regional percentage (42%) is larger than the farm percentage (10 %). This pattern is consistent with a relatively small number of large producers specializing in poultry. In contrast, the farm percentage (43%) for cattle is much larger than the regional percentage (14%) which is consistent with a large number of small farms deriving a high percentage of their income from cattle.

Table 4.2 Total and Average Percentage of the value of production from each commodity across all farms in the region

Heartland			Northern Crescent			Northern Great Plains		
Commodity	Regional Percentage	Farm Average Percentage	Commodity	Regional Percentage	Farm Average Percentage	Commodity	Regional Percentage	Farm Average Percentage
Corn	27.5	29.6	Dairy	36.8	32.9	Cattle	36.4	45.1
Soybean	21.9	25.0	Nursery	15.8	8.3	Other Crops	15.1	16.4
Cattle	13.4	16.8	Other Crops	12.6	9.0	Wheat	14.2	18.2
Hogs	12.9	7.3	Cattle	7.2	13.7	Soybeans	8.0	7.3
Other Crops	12.6	3.7	Vegetables	5.7	4.6	Dairy	5.7	2.2

Table 4.2 Total and Average Percentage of the value of production from each commodity across all farms in the region

Prairie Gateway			Eastern Uplands			Southern Seaboard		
Commodity	Regional Percentage	Farm Average Percentage	Commodity	Regional Percentage	Farm Average Percentage	Commodity	Regional Percentage	Farm Average Percentage
Cattle	39.5	43.5	Poultry	42.4	10.9	Poultry	51.5	21.6
Corn	14.1	8.2	Cattle	14.0	43.5	Hogs	14.0	4.7
Wheat	9.2	12.7	Nursery	12.7	5.8	Tobacco	7.8	9.3
Dairy	7.2	1.7	Dairy	8.8	6.4	Nursery	4.6	3.0
Other Crops	6.9	8.1	Tobacco	5.7	13.7	Cattle	4.5	35.5

Table 4.2 Total and Average Percentage of the value of production from each commodity across all farms in the region

Fruitful Rim			Basin & Range			Mississippi Portal		
Commodity	Regional Percentage	Farm Average Percentage	Commodity	Regional Percentage	Farm Average Percentage	Commodity	Regional Percentage	Farm Average Percentage
Vegetables	19.2	3.5	Cattle	29.4	48.6	Soybean	16.0	16.8
Fruit	18.2	25.1	Other Crops	17.3	17.7	Poultry	15.4	3.3
Dairy	18.1	5.1	Vegetables	15.4	5.0	Other Crops	13.6	8.3
Nursery	14.5	9.0	Nursery	9.8	3.2	Cotton	13.4	9.4
Other Crops	13.4	10.2	Wheat	7.8	7.0	Rice	9.8	10.2

In the Southern Seaboard, about 52 percent of the total income from agricultural production comes from poultry. About a fifth of the total agricultural value in the Southern Seaboard comes from hogs and tobacco, and nursery and cattle account for over 4 percent each. The top five commodities account for over 80 percent of the value of agricultural production in the Southern Seaboard. The regional and farm percentages for poultry and cattle are dramatically different in this region also. For poultry, the higher regional percentage is attributable to a small number of large producers dominating poultry production in the region, while the lower regional percentage for cattle is consistent with a large number of small farms deriving a relatively high percentage of their income from cattle.

Vegetables, fruit, dairy, nursery, and “other crops” are the five top commodities in the Fruitful Rim. These commodities account for over 80 percent of the value of production in the region with over 50 percent of the total regional value coming from vegetables, fruit, and nursery. Dairy accounted for about 18 percent of the regional value of production and other crops account for about 14 percent. Nearly 20 percent of the total income from agricultural production comes from vegetables, and the average percentage of value of production per farm from vegetables is 3.5 percent. This significant difference is due to a relatively small number of large producers of vegetables in the Fruitful Rim.

Judged by the percentage of regional agricultural income derived from cattle, it is the most important commodity in the Basin and Range region. Cattle accounts for 29 percent of the total income from agricultural production, and the average percentage of value of production per farm from cattle is about 49 percent. This difference is consistent with a large number of small farms in the Basin and Range region specializing in cattle.

Furthermore, over 30 percent of the total agricultural value in the region comes from vegetables, and “other crops”, and nursery and wheat account for nearly 10 and 8 percent respectively. These top five commodities account for 80 percent of the value of production in the Basin and Range region.

In the Mississippi Portal, 16 percent of the total income from agricultural production comes from soybeans and 15 percent from poultry. “Other crops” and cotton account for 13 percent each and rice rounds out the top five commodities representing about 10 percent of this region’s value of production. These top five commodities account for nearly 70 percent of the value of agricultural production in the Mississippi Portal. There are no large gaps in the regional and farm percentages for the top five commodities in the region.

Distribution of Farms by Type and Value of Production

The distribution of farms by the percentage of value derived from the major commodities will be discussed in this section. We will focus on distributions for the four most important commodities in each region, as measured by the regional percentages in Table 4.2. However, since different combinations of crops are included in the “other crops” farm type, “other crops” means different combinations for different farms, and distributions for the “other crop” farm type will not be reported here. Table 4.3 shows the distribution of farms by the percentage of value of production derived from each of the top commodities produced in each resource region. This table also shows the estimated value of production each commodity contributed to the region in 2002, and the percentage of regional value of production for each commodity.

Corn, soybeans, cattle, and hogs are important commodities in the Heartland. Table 4.3 shows that about 68 percent of farms in the Heartland derived at least some of their value of production from corn. An estimated 13 percent of Heartland farms received up to 20 percent of

their value of production from corn. Fifteen percent of farms received between 20 and 40 percent of their income from corn, and the remaining forty percent of farms in the Heartland received from 40 to 100 percent of their value of production from corn.

Over 70 percent of farms in the Heartland derived part of their value of production from soybeans. About half of Heartland farms received some income from cattle, but most Heartland cattle producers received less than 40 percent of their income from cattle. Fewer than 15 percent of farms in the Heartland produced hogs, but hogs accounted for almost 13 percent of the total value of agricultural production in the Heartland in 2002.

In the Northern Crescent, dairy, nursery, cattle, and vegetables are important commodities. Although dairy is one of the most important commodities in this region, 60.0 percent of farms did not produce any dairy products during the reference year. However, 29.1 percent of all farms in the region, and almost 75 percent of dairy producing farms, received between 80 and 100 percent of their value of production from dairy. This table also shows about 10 percent of farms in the Northern Crescent produced any nursery crops even though nursery accounted for almost 16 percent of the value of all agricultural production in the region. About half of Northern Crescent farms produced some cattle, but most cattle producing farms derived less than 20 percent of their income from cattle.

Cattle, wheat, soybeans, and dairy are important commodities in the Northern Great Plains region. Around 65 percent of farms in the region derived some of their value of production from cattle. The majority of cattle producing farms derived more than 20 percent of their income from cattle, with almost 60 percent of cattle producing farms and almost 40 percent of all farms in the region deriving more than 80 percent of their value of production from cattle. About half of farms in the Northern Great Plains derived part of their income from wheat, and

less than 25 percent of farms in this region derived income from soybeans. This table also shows only 3 percent of farms in the Northern Great Plains produced any revenue from dairy in 2002, but dairy still accounted for almost 6 percent of the total value of agricultural production in the region.

In the Prairie Gateway, important farm types include cattle, corn, wheat, and dairy. Sixty five percent of farms in the Prairie Gateway derived part of their value of production from cattle, and 33 percent of all farms in the region, and over half of farms with cattle in the region, derived over 80 percent of their value of production from cattle. Fewer than 20 percent of farms in the Prairie Gateway produced corn in 2002, but corn accounted for 14 percent of the total value of production in the region. About 40 percent of Prairie Gateway farms derived part of their income from wheat, but about 40 percent of wheat producers in the region received 20 percent or less of their value of production from wheat. Less than 3 percent of all farms in the region produced dairy, but dairy accounted for over 7 percent of the total value of agricultural production in the region.

Poultry, cattle, nursery, dairy, and tobacco are important farm types in the Eastern Uplands. Only about 12 percent of farms in the region produced any poultry in 2002, but poultry accounted for over 40 percent of the total value of agricultural production in the Eastern Uplands. More than 85 percent of poultry producers in the Eastern Uplands derived more than 80 percent of their value of production from poultry.

Table 4.3 Distribution of farms by percentage of value of production from major commodities

Heartland				
<u>Percent of Value of Production</u>	<u>Corn (percent of farms)</u>	<u>Soybeans (percent of farms)</u>	<u>Cattle (percent of farms)</u>	<u>Hogs (percent of farms)</u>
0	31.5	27.5	54.3	85.8
0-20	12.9	15.8	20.4	3.2
20-40	15.0	30.1	9.2	3.3
40-60	26.0	21.5	4.6	1.9
60-80	11.8	3.6	3.6	2.2
80-100	2.8	1.6	7.9	3.7
Value of Production in Region (\$ million)	10,010	7,999	4,875	4,704
Percentage of regional value of production	27.5	21.9	13.4	12.9

Northern Crescent				
<u>Percent of Value of Production</u>	<u>Dairy (percent of farms)</u>	<u>Nursery (percent of farms)</u>	<u>Cattle (percent of farms)</u>	<u>Vegetables (percent of farms)</u>
0	60.6	89.9	45.6	90.0
0-20	0.2	1.1	36.7	4.4
20-40	1.5	0.7	5.1	0.9
40-60	2.3	0.3	3.7	0.9
60-80	6.3	0.7	2.5	1.0
80-100	29.1	7.3	6.4	2.8
Value of Production in Region (\$ million)	7,735	3,335	1,507	1,188
Percentage of regional value of production	36.8	15.8	7.2	5.7

Table 4.3 Distribution of farms by percentage of value of production from major commodities (continued)

Northern Great Plains				
<u>Percent of Value of Production</u>	<u>Cattle (percent of farms)</u>	<u>Wheat (percent of farms)</u>	<u>Soybeans (percent of farms)</u>	<u>Dairy (percent of farms)</u>
0	35.7	51.0	77.2	97.0
0-20	11.4	18.6	8.7	0.0
20-40	5.2	12.3	7.1	0.5
40-60	5.7	7.1	4.5	0.0
60-80	4.4	3.6	1.8	0.6
80-100	37.8	7.5	0.7	1.9
Value of Production in Region (\$ million)	3,560	1,385	779	555
Percentage of regional value of production	36.4	14.2	8.0	5.7

Prairie Gateway				
<u>Percent of Value of Production</u>	<u>Cattle (percent of farms)</u>	<u>Corn (percent of farms)</u>	<u>Wheat (percent of farms)</u>	<u>Dairy (percent of farms)</u>
0	34.9	81.1	64.2	97.7
0-20	10.9	5.1	14.6	0.0
20-40	7.9	3.4	7.7	0.5
40-60	6.6	4.7	6.2	0.0
60-80	6.7	4.0	3.4	0.6
80-100	33.0	1.6	3.9	1.2
Value of Production in Region (\$ million)	5,860	2,097	1,358	1,062
Percentage of regional value of production	43.5	14.1	9.2	7.2

Table 4.3 Distribution of farms by percentage of value of production from major commodities (continued)

Eastern Uplands				
<u>Percent of Value of Production</u>	<u>Poultry (percent of farms)</u>	<u>Cattle (percent of farms)</u>	<u>Nursery (percent of farms)</u>	<u>Dairy (percent of farms)</u>
0	87.5	26.5	92.6	91.8
0-20	.8	19.9	0.0	0.0
20-40	0	7.8	0.0	.5
40-60	.6	9.0	2.6	.5
60-80	.3	2.4	.1	2.8
80-100	10.7	34.3	4.7	4.4
Value of Production in Region (\$ million)	3,390	1,117	1,018	705
Percentage of regional value of production	42.4	14.0	12.7	8.8

Southern Seaboard				
<u>Percent of Value of Production</u>	<u>Poultry (percent of farms)</u>	<u>Hogs (percent of farms)</u>	<u>Tobacco (percent of farms)</u>	<u>Nursery (percent of farms)</u>
0	75.9	93.6	87.3	96.3
0-20	1.5	.5	1.3	.3
20-40	.4	0	.7	.2
40-60	.2	2.6	1.7	.5
60-80	1.0	.2	1.3	0
80-100	20.9	3.1	7.8	2.6
Value of Production in Region (\$ million)	7,933	2,156	1,199	711
Percentage of regional value of production	51.5	14.0	7.8	4.6

Table 4.3 Distribution of farms by percentage of value of production from major commodities (continued)

Fruitful Rim				
<u>Percent of Value of Production</u>	<u>Vegetables (percent of farms)</u>	<u>Fruit (percent of farms)</u>	<u>Dairy (percent of farms)</u>	<u>Nursery (percent of farms)</u>
0	93.1	73.0	94.8	90.5
0-20	2.2	1.5	0	.3
20-40	.6	.4	0	0
40-60	1.3	.1	.1	.2
60-80	.8	.2	.2	.2
80-100	2.0	24.8	5.2	8.7
Value of Production in Region (\$ million)	6,919	6,579	6,535	5,219
Percentage of regional value of production	19.2	18.2	18.1	14.5

Basin & Range				
<u>Percent of Value of Production</u>	<u>Cattle (percent of farms)</u>	<u>Vegetables (percent of farms)</u>	<u>Nursery (percent of farms)</u>	<u>Wheat (percent of farms)</u>
0	36.1	91.4	96.8	85.0
0-20	7.2	2.1	0	3.2
20-40	5.3	.8	0	4.4
40-60	4.9	1.3	0	2.9
60-80	5.4	.4	0	1.5
80-100	41.2	3.9	3.2	2.9
Value of Production in Region (\$ million)	1,534	801	510	408
Percentage of regional value of production	29.4	15.4	9.8	7.8

Table 4.3 Distribution of farms by percentage of value of production from major commodities

Mississippi Portal				
<u>Percent of Value of Production</u>	<u>Soybeans (percent of farms)</u>	<u>Poultry (percent of farms)</u>	<u>Cotton (percent of farms)</u>	<u>Rice (percent of farms)</u>
0	59.0	96.6	83.3	78.7
0-20	12.1	0	1.9	4.0
20-40	9.9	.1	4.1	5.6
40-60	9.9	0	3.4	5.3
60-80	4.0	0	2.4	2.8
80-100	5.1	3.3	4.8	3.7
Value of Production in Region (\$ million)	828	796	695	506
Percentage of regional value of production	16.0	15.4	13.4	9.8

Almost 75 percent of farms in the region derived part of their income from cattle, and almost half of the region's cattle producers derived more than 80 percent of their income from cattle production. Over 34 percent of all farms in the Eastern Uplands derived between 80 and 100 percent of their value of production from cattle. About 13 percent of the total value of agricultural production in the Eastern Uplands came from nursery, and dairy accounted for almost 10 percent of the total value of agricultural production in the region.

Poultry, hogs, tobacco, and nursery are important commodities in the Southern Seaboard. Fewer than 25 percent of farms in the region produced any poultry in 2002, but poultry accounted for over 50 percent of the total value of agricultural production in the region. Over 86 percent of farms that did derive part of their income from poultry derived between 80 and 100 percent of their value of production from poultry. Over 93 percent of farms in the Southern Seaboard did not produce any hogs in 2002, but hogs accounted for 14 percent of the total value of agricultural production in the region. Fewer than 15 percent of farms in the Southern Seaboard produced any tobacco, but tobacco accounted for almost 8 percent of the total value of production in the region. Fewer than 4 percent of farms in the region derived any income from nursery production, but nursery accounted for almost 5 percent of the total value of agricultural production in the Southern Seaboard.

Vegetables, fruit, dairy, and nursery are important commodities in the Fruitful Rim. Fewer than 7 percent of farms in the Fruitful Rim grew any vegetables in 2002, but vegetables accounted for almost 20 percent of the total value of agricultural production in the region. About 27 percent of farms in the region produced fruit, and almost all of those farms producing fruit derived between 80 and 100 percent of their value of production from fruit. Fruit production accounted for almost 20 percent of the total value of agricultural production in the region. Only

5.2 percent of the region's farms derived income from dairy, but dairy accounted for 18 percent of the total value of agricultural production in the region. Only about 10 percent of farms derived income from nursery crops, but nursery accounted for nearly 15 percent of the total value of agricultural production in the Fruitful Rim.

Important farm types in the Basin and Range region include cattle, vegetables, nursery, and wheat. Table 4.3 shows that over 60 percent of farms in the region derived part of their income from cattle. An estimated 41 percent of farms in the Basin and Range derived between 80 and 100 percent of their value of production from this commodity. Fewer than 10 percent of farms in the region produced vegetables, but vegetables accounted for 15 percent of the total value of agricultural production in the Basin and Range. Only about 3 percent of farms in the Basin and Range derived any income from nursery production in 2002, but farms producing nursery accounted for nearly 10 percent of the total value of agricultural production in the region. Table 4.3 also shows that 85 percent of farms in the region did not produce wheat during the reference year. However, wheat accounted for almost 8 percent of the total value of agricultural production in the region.

In the Mississippi Portal, soybeans, poultry, cotton, and rice are important commodities. About 40 percent of farms in this region derived part of their income from soybeans, and over half of these farms derived less than 40 percent of their value of production from producing soybeans. Although, poultry is one of the most important commodities to this region, only 3.4 percent of farms produced any poultry in 2002. However, poultry accounted for about 15 percent of the total value of agricultural production in the region. Over 83 percent of the Mississippi Portal's farms did not produce any cotton during the reference year, but cotton producing farms accounted for 13 percent of the total value of agricultural production in the

region. Less than 25 percent of farms in the Mississippi Portal derived part of their value of production from rice. Rice accounted for nearly 10 percent of the total value of agricultural production in the Mississippi Portal.

CHAPTER V

IMPORTANCE OF TRADE AND GOVERNMENT PAYMENTS TO MAJOR U.S. AGRICULTURAL COMMODITIES

This chapter examines differences in the farm resource regions related to characteristics of the most important commodities produced in each region. Our focus in this chapter is on the importance of international trade and U.S. government subsidies to producers of the most important commodities in each region. Trade has become more important to U.S. agriculture in recent years. International trade has helped the U.S. expand agricultural markets, and generate additional economic activity. Currently, the U.S. is the world's largest agricultural exporter (FAS Online).

Although international trade is very important to the U.S. agricultural sector, trade often exposes U.S. producers to more risk. Producers of U.S. products that are exported are affected by production variability and changes in economic conditions in foreign countries, and by exchange rate fluctuations in importing and competing countries. Similarly, producers of U.S. products that are also imported are affected by production and economic conditions in exporting countries, export country policies, and exchange rate fluctuations. Also, changes in trade agreements affect producers of both exports and imports.

U.S. government payments to producers are also very important to the U.S. agricultural sector. About 40 percent of all farms receive payments; however, government benefits seem to be geographically concentrated as well as crop specific (Babcock). Even though this may be true, government payments have positive effects on the incomes of many farmers (Gale). They also enable some farmers to expand their operations, while helping other farmers remain viable.

Importance of Trade and Government Assistance to Major Commodities

Table 5.1 shows the U.S. value of production and the national percentages of value of production of exports, imports, and direct subsidies for top farm commodities for the year 2002. The table also shows the producer support estimate for each commodity. None of the data in Table 5.1 are from the Agricultural Resource Management Survey. The value of production data used in this table is from the Agricultural Statistics Database. According to the National Agricultural Statistical Service, value of production is derived by multiplying production by the estimated season average price received by farmers for the portion of the commodity actually sold (Agricultural Statistics). Government payments are not included in the NASS value of production figures in Table 5.1.

The producer support estimate (PSE) is an indicator of the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at farm gate level, arising from policy measures which support agriculture, regardless of their nature, objectives or impacts on farm production or income (OECD). The PSE includes both implicit and explicit payments, such as tax exemptions and budgetary payments. The percentage PSE in Table 5.1 is the ratio of the dollar PSE for the commodity to the value of production at farm gate prices plus budgetary support. These estimates are from the Producer and Consumer Support Estimates OECD Database (OECD). The PSE estimates were unavailable for some of the commodities listed in Table 5.1. Export and import data are from FAS Online, and all government subsidy data in the table were retrieved from the Environmental Working Group's Farm Subsidy Database.

Table 5.1 U.S. Value of Production and Relative Importance of Imports, Exports, and Government Payments, 2002

National Averages					
Commodity	U.S. Value of Production	% Value Exports	% Value Imports	% Value Government Payments	Producer Support Estimates (%)
Cattle	29,267,264,000	8.5	9.4	0.0	5 (beef & veal)
Dairy	24,886,929,000	3.8	7.0	3.4	46 (milk)
Corn	20,974,734,000	23.1	.13	9.5	17
Poultry	16,693,569,000	9.8	.51	0.0	5 (poultry & eggs)
Soybean	15,214,595,000	37.3	.13	4.4	13
Nursery	13,795,571,000	1.8	8.2	0.0	N/A
Hogs	11,442,171,000	10.3	8.9	0.0	5 (pig meat)
Fruit	10,507,402,000	8.1	20.4	0.0	N/A
Vegetables	10,257,611,000	29.5	43.8	0.0	N/A
Wheat	5,679,400,000	63.6	4.7	17.2	30
Cotton	3,777,132,000	53.4	.54	44.2	N/A
Tobacco	1,702,861,000	61.6	42.1	.29	N/A
Rice	979,628,000	78.9	17.2	109.6	52

The percentages of exports and imports were calculated by dividing the total value of exports and imports by the total value of production for each commodity. Subsidy payments as a percent of value of each commodity were calculated in a similar manner.

As shown in table 5.1, rice wheat, tobacco, cotton, soybeans, vegetables, corn, and fruit are heavily traded commodities. In 2002, the value of rice exports was 80 percent of the value of rice produced. Rice exports account for almost 12 percent of international rice trade which makes the U.S. the largest non-Asian rice exporting country (Childs). Although the U.S. is a major exporter of rice, it regularly imports rice as well. In 2002, rice imports were equal to nearly 20 percent of the value of rice production. The United States is also the world's leading exporter of wheat. Approximately, 64 percent of the value of wheat produced was exported in 2002, and this percentage could increase over the next few years. The United States Department of Agriculture expects world wheat trade to increase each year until 2009 (Vocke and Allen).

The United States also plays an important role in international tobacco trade. Large quantities of tobacco are imported annually, but exports are even larger. In 2002, tobacco export values were over 60 percent of the value of tobacco produced in the U.S., and imports were equal to 40 percent of the value of tobacco produced. The high levels of both exports and imports of tobacco reflect differences in varieties of tobacco that are grown in the United States and abroad. The United States mainly exports cigarettes, and is the largest importer of tobacco leaf.

Following China, the U.S. is the second largest producer of cotton, accounting for 25 percent of world trade (Meyer and MacDonald). Cotton is also a major export commodity. The value of U.S. cotton exports was over 50 percent of the value of U.S. cotton produced in 2002.

Due to substantial growth in soybean production, the U.S. is the world's largest producer and exporter of soybeans. Nearly 40 percent of the value of soybeans produced in the U.S. was exported in 2002; however, despite the United States' progress in soybean production and trade, the United States exports have steadily decreased since the late 1980's (Ash and Dohlman).

Export demand for U.S. vegetables has grown over the past 15 years. In 2002, vegetable export values were equal to 30 percent of the value of U.S. vegetable production, and vegetable imports were equal to almost 44 percent of the value of U.S. vegetable production. The U.S. imports large quantities of fresh market vegetables from Mexico and Canada (Lucier), high levels of both imports and exports of vegetables reflect differences in vegetables which are produced in the United States and abroad and differences in seasonal availability of vegetables which are produced domestically and also imported.

Other major U.S. commodities with high import or export values relative to U.S. production values are corn, with the value of exports equal to 23 percent of the value of production, and fruit, with imports equal to 20 percent of the value of production.

U.S. agricultural commodity programs have provided subsidies to producers of specific commodities since the mid 1930's. Current programs link payments to current or past production of selected commodities. Some important commodities, such as fruits, vegetables, and livestock, receive no direct subsidies while others, including grains and cotton, receive significant subsidies. Since different regions of the U.S. produce different commodities, as discussed earlier, regions also differ with respect to the magnitude and relative importance of subsidies they receive. Agricultural subsidy programs may come under increasing pressure in the future, due both to the large budget deficits in the United States and to controversy about agricultural subsidies of developed countries in international trade negotiations.

Farm commodities for which subsidies are high relative to their value of production may be particularly vulnerable to possible reductions in subsidies. Regions in which production of these commodities is important would be affected most adversely, at least in the short-run, by reductions in those subsidies.

Table 5.1 shows the following major commodities received direct government subsidies in 2002: rice, cotton, wheat, corn, soybeans, dairy, and tobacco. It is evident by looking at Table 5.1 that rice and cotton are the most heavily subsidized commodities in terms of value of subsidies relative to value of production. Rice also has the highest producer support estimate of the top farm commodities of 52. Indeed, in each of the past three years, government subsidy payments for rice have been greater than the total value of rice production. In 2000, rice's subsidy payment (\$1,539,845,383) exceeded its value of production (\$1,049,961,000) by more than \$450,000,000. In 2001, the government subsidy payment for rice was \$1,393,253,086 and the value of production was \$925,055,000. Table 5.1 shows the percentage of total value of rice production from government subsidy payments was also greater than 100 percent in 2002. Rice subsidies equaled \$1,073,167,886 in 2002 and the value of rice produced equaled \$979,628,000. Cotton is also subsidized more heavily than other commodities. The value of cotton subsidies in 2002 were equal to 44 percent of the value of cotton produced. Corn and wheat are the other subsidized commodities in terms of value of subsidies relative to value of production. Corn subsidies were equal to almost 10 percent of the value of corn produced, and wheat subsidies were equal to 17 percent of the value of wheat produced. The producer support estimate for dairy was very high even though, direct subsidies for dairy were low. The data from the Environmental Working Group's Farm Subsidy Database showed that livestock subsidies totaled \$976,410,000 in 2002; however, these subsidies were not listed by livestock type.

Therefore, government subsidy percentages for cattle, hogs, and poultry could not be calculated. However, producer support estimate for cattle, hogs, and poultry were quite low indicating limited government support for these livestock commodities.

Importance of Major Commodities to Each Farm Resource Region

Table 5.2 shows measures of the importance of selected major commodities to each region, and the importance of imports, exports, and government payments to those commodities. The measures of importance are farm type, regional percentage, and farms receiving some income. Farm type is the percentage of farms in the region with over 50 percent of their value of production coming from the specified commodity. Regional percentage is the percentage of regional value of production derived from each commodity, and farms receiving some income is the percentage of farms that derived part of their income from each commodity. The farm typology groups used in this chapter include farms where farming is the primary occupation of the farm operator. Those typology groups include farming occupation/low sales, farming occupation/high sales, large family farms, and very large family farms. In Table 5.2, production is the regional percentage of national value of production of each commodity listed. This production variable was calculated by dividing the regional value of production for each commodity by the U.S. value of production. Both of the values for this calculation were from the 2002 Agricultural Resource Management Survey.

Corn, soybeans, cattle, and hogs, are important commodities in the Heartland region. Table 5.2 shows the Heartland is a major producer of corn and soybeans. Almost 70 percent of the value of U.S. corn and U.S. soybeans were produced in the Heartland in 2002. Over 50 percent of the value of hog production occurred in the region as well. Corn and soybeans were heavily traded and subsidized.

Table 5.2. Major Agricultural Commodities and Importance of Trade and Subsidies by Region, 2002.¹

Heartland							
	Importance of Commodity to the Region			National Commodity Percentages			
	Farm Type ²	Regional Percentage ³	Farm Receiving Some Income ⁴	Production ⁵	% Value Exported	% Value Imported	% Government Subsidies&(PSE)
Corn	29.7	27.46	68.5	67.25	23.1	.1	9.5 (17)
Soybeans	9.5	21.94	72.6	69.42	37.3	.1	4.4 (13)
Cattle	12.6	13.37	45.7	22.51	8.5	9.4	0.0 (5)
Hogs	6.5	12.91	14.2	53.1	10.3	8.9	0.0 (5)

Northern Crescent							
	Importance of Commodity to the Region			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies&(PSE)
Dairy	34.3	36.75	39.4	39.7	3.8	7.0	3.4 (46)
Nursery	7.7	15.84	10.1	28.0	1.8	8.2	0.0(N/A)
Cattle	9.2	7.16	54.4	7.0	8.5	9.4	0.0 (5)
Vegetables	4.3	5.65	10.0	11.7	29.5	43.8	0.0 (N/A)

¹ Percentages in table assume “farms” defined as intermediate and commercial family farms using USDA’s farm typologies

² Percent of farms in the region that derive more than 50% of value of production from specified commodity

³ Percent of total value of agricultural production in region from specified commodity

⁴ Percent of farms in region receiving any income from specified commodity

⁵ National percentage of value of production of each commodity produced in the region

Table 5.2. Major Agricultural Commodities and Importance of Trade and Subsidies by Region, 2002.

Northern Great Plains							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies & (PSE)
Cattle	43.0	36.38	64.3	16.5	8.5	9.4	0.0 (5)
Wheat	12.6	14.15	49.0	30.7	63.6	4.7	17.7 (30)
Soybeans	4.4	7.96	22.8	6.8	37.3	.13	4.4 (13)
Dairy	2.4	5.67	3.0	2.9	3.8	7.0	3.4 (46)
Prairie Gateway							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies
Cattle	40.2	39.46	65.1	27.1	8.5	9.4	0.0 (5)
Corn	8.3	14.12	18.9	14.1	23.1	.13	9.5 (17)
Wheat	9.2	9.15	35.8	30.1	63.5	4.6	17.7 (30)
Dairy	1.7	7.15	2.3	5.5	3.80	7.0	3.4 (46)

Table 5.2. Major Agricultural Commodities and Importance of Trade and Subsidies by Region, 2002.

Eastern Uplands							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies & (PSE)
Poultry	10.2	42.3	12.5	21.5	9.8	.5	0.0 (5)
Cattle	35.9	13.9	73.5	5.2	8.5	9.3	0.0 (5)
Nursery	4.4	12.7	7.4	8.5	1.8	8.2	0.0 (N/A)
Dairy	6.7	8.8	8.2	3.6	3.8	7.0	3.4 (46)
Tobacco	13.9	5.6	20.0	22.5	61.6	42.1	.3 (N/A)
Southern Seaboard							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies & (PSE)
Poultry	21.4	51.46	24.1	50.2	9.8	.5	0.0 (5)
Hogs	5.5	13.99	6.4	24.3	10.2	8.9	0.0 (5)
Tobacco	9.6	7.78	12.7	59.5	61.6	42.1	.3 (N/A)
Nursery	3.1	4.61	3.7	6.0	1.8	8.2	0.0 (N/A)
Cattle	33.8	4.49	54.5	3.2	8.5	.1	0.0 (5)

Table 5.2. Major Agricultural Commodities and Importance of Trade and Subsidies by Region, 2002.

Fruitful Rim							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies & (PSE)
Vegetables	2.6	19.18	6.9	68.0	29.5	43.8	0.0 (N/A)
Fruit	23.0	18.23	27.0	86.2	3.2	.02	0.0 (N/A)
Dairy	5.0	18.11	5.5	33.6	3.8	7.0	3.4 (46)
Nursery	8.4	14.47	9.5	43.8	1.8	8.2	0.0 (N/A)
Basin and Range							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies & PSE
Cattle	43.1	29.41	63.9	7.1	8.5	9.4	0.0 (5)
Vegetables	4.2	15.36	8.6	7.9	29.5	43.8	0.0 (N/A)
Nursery	2.8	9.77	3.2	4.3	1.8	8.2	0.0 (N/A)
Wheat	5.4	7.82	15.0	9.1	63.6	4.7	17.2 (30)

Table 5.2. Major Agricultural Commodities and Importance of Trade and Subsidies by Region, 2002.

Mississippi Portal							
	Regional Percentages			National Commodity Percentages			
	Farm Type	Regional Percentage	Farm Receiving Some Income	Production	% Value Exported	% Value Imported	% Government Subsidies & (PSE)
Soybeans	11.4	15.98	41.0	7.2	37.3	.1	4.4 (13)
Poultry	3.2	15.37	3.4	5.0	9.8	.5	0.0 (5)
Cotton	8.6	13.41	16.7	25.4	53.4	.54	44.2 (N/A)
Rice	8.2	9.77	21.3	67.6	78.8	17.1	109.6 (52)

Dairy, nursery, cattle, and vegetables are important commodities in the Northern Crescent. Almost 40 percent of the value U.S. dairy products were produced in the region during 2002. Vegetables were the most heavily traded of the most important commodities in the region, and dairy is the only subsidized important commodity. The producer support estimate shows government support for dairy was substantial in 2002.

In the Northern Great Plains cattle, wheat, soybeans, and dairy are important commodities. Wheat and soybeans are the most heavily traded of the most important commodities in the region, and wheat is also the most heavily subsidized of the important commodities. Soybeans and dairy products also received government payments in 2002.

Cattle, corn, wheat, and dairy are the most important commodities in the Prairie Gateway. Wheat and corn are the most heavily traded commodities in the region, and wheat is the most heavily subsidized commodity. However, corn and dairy also received government payments.

In the Eastern Uplands poultry, cattle, nursery, dairy, and tobacco are important. Of the most important commodities in the region, tobacco is the most heavily traded. The important commodities in this region were not heavily subsidized in 2002.

In the Southern Seaboard poultry, hogs, tobacco, nursery, and cattle are important. Fifty percent of the value of U.S. poultry was produced in the region in 2002, and almost 60 percent of the value of tobacco was produced in the Southern Seaboard during the reference year. Tobacco is the most heavily traded important commodity in the region, and none of the important commodities in the Southern Seaboard were heavily subsidized.

Vegetables, fruit, dairy, and nursery are important commodities in the Fruitful Rim. The Fruitful Rim is a major producer of each of these commodities. Nearly 70 percent of the value U.S. vegetable production in 2002 and over 85 percent of the value of fruit was produced in the

Fruitful Rim. Over 30 percent of the value of U.S. dairy production and over 40 percent of the value of nursery crops were produced in the region as well. Vegetables were the most heavily traded of the important commodities in the region.

Cattle, vegetables, nursery, and wheat are important commodities in the Basin and Range region. A larger percentage of vegetables and wheat were traded in 2002 compared to other commodities in the region. Wheat was also the only subsidized important commodity in the region.

In the Mississippi Portal soybeans, poultry, cotton, and rice are important commodities. Table 5.2 shows the Mississippi Portal is a major producer of rice. Almost 70 percent of the value of rice produced in the U.S. was produced in the Mississippi Portal in 2002. With the exception of poultry, the major commodities in the Mississippi Portal are heavily traded, and heavily subsidized. By value, nearly 80 percent of rice, almost 40 percent of soybeans, and over 50 percent of cotton was exported in 2002. Cotton and rice are also the most heavily subsidized of the important commodities in the region.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

Regional Household Incomes

Grouping farms into rural residence, intermediate, and commercial farm types revealed differences in income distributions and levels across farms and farm resource regions. Combining intermediate and commercial family farms to form the primary farm group allowed a greater focus on the farms most dependent on farming. The first section of Chapter VI will discuss the average income measures for the lowest household income regions (bottom 5) for rural residence, intermediate, commercial family, all family and primary family farms. In Table 6.1 the regions are shown in descending order in terms of total household income, household farm income, and household off-farm income for rural residence, intermediate, and commercial family farms. Table 6.2 shows the regions in descending order in terms of income levels for all family farms and primary family farms. This table also shows the percentage of primary family farms in each region that had a total household income below \$30,000 in 2002.

Rural Residence Farms Household Income

Rural residence farms are farms that consider farming a secondary activity both in terms of resources invested in the farm and the amount of income farming contributes to the household. Rural residence farms include farms where operators are retired as well as farms where operators' primary activity is working off-farm. Regions with low total household incomes for rural residence farms include the Heartland, Northern Crescent, Northern Great Plains,

Table 6.1 Household Income Rankings for Three Family Farm Typologies

Rural Residence	<u>Total</u> <u>HHI</u>		<u>Farm</u> <u>HHI</u>		<u>Total</u> <u>OFI</u>
Fruitful Rim	91,238	North Grt Plains	-1,411	Fruitful Rim	97,195
Basin & Range	75,381	Prairie Gateway	-3,218	Basin & Range	82,653
Prairie Gateway	70,902	Heartland	-3,380	Prairie Gateway	74,120
S. Seaboard	65,038	Eastern Uplands	-4,422	S. Seaboard	70,229
Heartland	61,358	MississippiPortal	-4,721	Heartland	64,738
N. Crescent	58,581	S. Seaboard	-5,192	N. Crescent	64,645
North Grt Plains	58,312	Fruitful Rim	-5,958	Mississippi Portal	61,000
MississippiPortal	56,279	N. Crescent	-6,064	North Grt Plains	59,723
Eastern Uplands	52,971	Basin & Range	-7,271	Eastern Uplands	57,392
Intermediate	<u>Total</u> <u>HHI</u>		<u>Farm</u> <u>HHI</u>		<u>Total</u> <u>OFI</u>
Prairie Gateway	73,839	Heartland	6,956	Prairie Gateway	71,976
Fruitful Rim	64,189	North Grt Plains	6,408	Basin & Range	64,113
Eastern Uplands	60,223	MississippiPortal	5,779	Fruitful Rim	60,036
Basin & Range	57,945	Fruitful Rim	4,153	Eastern Uplands	58,787
S. Seaboard	56,869	S. Seaboard	3,653	S. Seaboard	53,216
Heartland	48,083	Prairie Gateway	1,863	N. Crescent	43,639
MississippiPortal	47,691	Eastern Uplands	1,436	Mississippi Portal	41,912
N. Crescent	42,123	N. Crescent	-1,515	Heartland	41,127
North Grt Plains	41,279	Basin & Range	-6,167	North Grt Plains	34,872
Commercial	<u>Total</u> <u>HHI</u>		<u>Farm</u> <u>HHI</u>		<u>Total</u> <u>OFI</u>
Fruitful Rim	209,895	Fruitful Rim	162,429	Mississippi Portal	47,613
Basin & Range	192,081	Basin & Range	159,696	Fruitful Rim	47,465
MississippiPortal	142,527	MississippiPortal	94,914	S. Seaboard	42,917
N. Crescent	114,158	N. Crescent	79,815	Prairie Gateway	42,313
North Grt Plains	113,026	North Grt Plains	75,588	Eastern Uplands	38,900
Prairie Gateway	99,809	Prairie Gateway	57,495	North Grt Plains	37,438
Heartland	87,340	Heartland	55,691	N. Crescent	34,343
S. Seaboard	85,286	S. Seaboard	42,370	Basin & Range	32,385
Eastern Uplands	67,320	Eastern Uplands	28,420	Heartland	31,650

Table 6.2 Household Income Rankings for All Family Farms and Primary Family Farms

All Family	Total HHI		Farm HHI		Total OFI	
Fruitful Rim	94,091	North Grt Plains	11,580	Fruitful Rim	82,732	
Basin and Range	76,721	Fruitful Rim	11,359	Basin and Range	74,547	
Prairie Gateway	73,239	Mississippi Portal	6,619	Prairie Gateway	71,866	
S. Seaboard	64,840	Heartland	5,882	S. Seaboard	64,362	
Mississippi Portal	62,664	Basin and Range	2,174	Eastern Uplands	57,214	
Heartland	59,426	Prairie Gateway	1,373	Mississippi Portal	56,045	
North Grt Plains	57,494	N. Crescent	1,087	N. Crescent	55,549	
N. Crescent	56,635	S. Seaboard	479	Heartland	53,543	
Eastern Uplands	54,960	Eastern Uplands	-2,254	North Grt Plains	45,914	

Primary Family	Total HHI		Farm HHI		Total OFI	Pct. Tot HHI < \$30,000 ¹
Fruitful Rim	99,165	Fruitful Rim	42,146	Prairie Gateway	67,544	Fruitful Rim 32.1%
Basin and Range	79,279	Mississippi Portal	34,727	Basin and Range	59,067	Prairie Gateway 34.9%
Mississippi Portal	78,491	North Grt Plains	21,444	Fruitful Rim	57,018	Mississippi Portal 35.0%
Prairie Gateway	77,719	Basin and Range	20,212	Eastern Uplands	56,674	Basin and Range 35.2%
S. Seaboard	64,374	Heartland	17,919	S. Seaboard	50,496	Heartland 35.7%
Eastern Uplands	60,977	S. Seaboard	13,878	Mississippi Portal	43,764	S. Seaboard 36.9%
Heartland	56,914	N. Crescent	11,631	N. Crescent	42,136	North Grt Plains 38.3%
North Grt Plains	56,874	Prairie Gateway	10,175	Heartland	38,995	Eastern Uplands 40.8%
N. Crescent	53,767	Eastern Uplands	4,303	North Grt Plains	35,430	N. Crescent 41.8%

1 Percentage of primary family farms in region with total household income below \$30,000.

Mississippi Portal, and Eastern Uplands. The average total household income for all rural residence farms was greater than the average income for U.S. households (\$57,852) in 2002 except for rural residence farms in Mississippi Portal and Eastern Uplands. The second income column of the rural residence section of Table 6.1 shows the household farm incomes are negative for rural residence farms in all regions. The final income column of the table also shows the low total household income averages for the bottom five regions are largely due to low off-farm income in those regions since the five lowest average total household incomes are also the five lowest average off-farm incomes.

Intermediate Farms Household Income

Intermediate farms include family farms where farming is the primary occupation of the operator, and have sales below \$250,000. The Southern Seaboard, Heartland, Mississippi Portal, Northern Crescent, and Northern Great Plains had the lowest total household incomes for intermediate farms, which were all less than the U.S. average household income of \$57,852. The highest regional average household farm income for intermediate farms was under \$7,000. Among the intermediate farms with the lowest total household incomes, average household farm incomes range from \$3,653 in the Southern Seaboard to \$-1,515 in the Northern Crescent. The region with the lowest average farm income for intermediate farms, the Basin and Range (\$-6,167) was not among the five regions with the lowest average total household income for intermediate farms. In fact, the three regions with the highest average household farm incomes for intermediate farms (Heartland, Northern Great Plains, and Mississippi Portal) were among the five regions with the lowest average total household incomes. As was true for rural residence farms, the five regions with the lowest average total household income for intermediate farms were the regions with the lowest average off-farm income for intermediate farms. Average off-

farm income for intermediate farms for all of these low total household income regions were below the lowest average off-farm income in any region for rural residence farms.

Commercial Family Farms Household Income

Commercial family farms are defined as family farms with sales above \$250,000, and farming is the primary occupation of the operator. As shown in Table 6.2, regions with low total household incomes include the Northern Great Plains, Prairie Gateway, Heartland, Southern Seaboard, and Eastern Uplands. The average total household income for commercial farms in all regions is greater than the average U.S. household income for 2002.

For rural residence and intermediate farms, regions with the lowest total household income were those with the lowest average off-farm incomes. This pattern changes for commercial family farms where the regions with the lowest average total incomes are the same regions, in the same order, as those with the lowest average household farm income. Average total household incomes for the five regions with the lowest averages exhibit a wide income range. Eastern Uplands has the lowest average of \$67,320, followed by Southern Seaboard and Heartland with averages in the middle to high \$80,000 range, Prairie Gateway had an average close to \$100,000, and Northern Great Plains had an average over \$113,000. This wide range of average total household income for the low average commercial family farms is also apparent in the average farm income for those regions. Household farm income averages range from only \$28,000 in Eastern Uplands to over \$75,000 in Northern Great Plains. Even though average off-farm income for commercial farms was generally much lower than for rural residence or intermediate farms, off-farm income is an important component of total household income on average. Indeed, average off-farm income is greater than average farm income for commercial farms in both Eastern Uplands and Southern Seaboard.

Household Incomes of Farm Aggregates

Table 6.2 shows regional average household incomes for two aggregates of the farm typologies already discussed. The “all family” figures are weighted averages combining all three farm categories: rural residence, intermediate, and commercial family farms. The “primary family” category combines the two family farm typologies for which farming is the primary activity of the farm operator.

Average household incomes are reported for the “all family” category because these averages apply to the broadest definition of a farm as a place selling more than \$1,000 worth of agricultural products in a year. Combining data for “farms” with a thousand dollars in sales and a retired operator with farms selling over a million dollars of products annually, however, produces averages which are difficult to interpret, and we shall not attempt to do so here.

The “primary family” farm aggregation is more useful than the “all family” aggregation because it excludes lifestyle and retirement farms. Although averages for this aggregate are less revealing than averages reported separately for intermediate and commercial family farms, the combination of these groups represent what could be considered the universe of family farms in the U.S. Some farms in this aggregation are very small and others very large, but they have common characteristics that farm income is normally an important component of household income and farming is the primary activity of the farm operator. The household income averages for primary family farms do not add much new information beyond what was previously seen by analyzing intermediate and commercial farms separately. The final column of the primary family farm section of Table 6.2, however, reveals some additional information about the lower end of the total household income distribution for primary farms in each region.

Average income figures can be misleading in representing income conditions in a region because they can be affected by the presence of a few extremely high or low observations. By looking at the estimated percentages of farms in a region with incomes below \$30,000, we can get a better idea of how regions differ with respect to the presence of low household income farms.

Although there are small changes in the order of the regions, there were no dramatic differences between the view suggested by average total household income and the proportion of primary farms with income below \$30,000. The four regions with the highest total household incomes are also the regions with the lowest percentage of primary family farms with total household incomes below \$30,000, and the five regions with the lowest total household income have the highest percentage of primary family farms with total household incomes below \$30,000. The Fruitful Rim had the highest total household income of \$99,165, and the smallest percentage of farms with incomes less than \$30,000. Similarly, the Northern Crescent had the lowest total household income of \$53,767, and the largest percentage of farms with incomes less than \$30,000.

Government Payments

Government payments from the Agricultural Resource Management Survey include all government payments including all payments from commodity specific programs and payments under conservation and environmental programs. The commodity specific portions of government payments are based on the quantity of subsidized commodities produced by the farm, currently or in past years, and on the payment rate specified for each commodity in the Farm Bill. Average subsidies per farm are higher in regions where a greater proportion of farmers grow subsidized crops and in regions with larger farms producing larger amounts of subsidized commodities. The average government payment for intermediate (\$1,586) and

commercial family farms in the Eastern Uplands (10,528) was much lower than the average in other regions. Part of the reason for the low average payment is because the important commodities in the region are not supported by direct subsidies.

In contrast, regions with high average government payments are typically those regions that produce significant amounts of government supported commodities. The Mississippi Portal and Northern Great Plains received the highest average government payments across intermediate and commercial family farms. For commercial farms, the Mississippi Portal received an average government payment of \$71,058, while the second highest average for commercial farms, in the Northern Great Plains, was less than \$40,000.

In general, the percentage of farms receiving government payments is higher for intermediate farms than rural residence farms, and is higher for commercial farms than intermediate farms. With respect to regional differences in the percentage of intermediate farms receiving government payments, the Eastern Uplands (37.9%), Southern Seaboard (34.0%), and Fruitful Rim (22.0%) had the lowest percentage of government payment recipients across regions. Livestock and nursery crops are important commodities in the Eastern Uplands and Southern Seaboard, and fruit, vegetables, and nursery crops are important in the Fruitful Rim.

The Northern Crescent, Basin and Range, and Mississippi Portal had between 43 and 55 percent of intermediate farms receiving government payments, and the Prairie Gateway (70.5%), Heartland (77.5%), and Northern Great Plains (90.0%) had the greatest percentage of government payment recipients among intermediate farms. Food and feed grains are important commodities in the regions with high percentages of farms receiving government payments.

The three regions with the lowest percentage of commercial farms receiving government payments are the same regions with the lowest percentage of intermediate farms receiving

government payments. Those regions include the Eastern Uplands (38.7%), Southern Seaboard (48%), and Fruitful Rim (49.6%). The fact that the Eastern Uplands had the lowest average government payment for commercial family farms is consistent with this region also having the lowest percentage of government payment recipients. The Basin and Range and Northern Crescent regions had about 70 percent of commercial family farms that received government payments in 2002, while the Heartland, Northern Great Plains, and Prairie Gateway all had over 90 percent of government payment recipients among commercial family farms.

Despite the fact that the Mississippi Portal had only the fourth highest percentage of commercial family farm government payments recipients, commercial family farms in the region received the largest average government payment. The explanation for this is that there are larger commercial farms producing large amounts of highly supported commodities in the Mississippi Portal. As Table 3.12 indicated, 9.2 percent of primary farms in the Mississippi Portal received government payments of more than \$100,000 and 7.9 percent received payments between \$60,000 and \$100,000. These percentages are well above the percentage of farms receiving these amounts in other regions. The Southern Seaboard was the region with the second highest percentage of primary farms receiving more than \$100,000 in government payments at 3.0 percent, and the Northern Great Plains had the second highest percentage of primary farms receiving between \$60,000 and \$100,000 with 4.8 percent of primary farms receiving this amount.

Regional Commodity Mixes and Average Household Farm Incomes

As shown in Table 6.2, regions with low farm incomes for primary family farms include the Eastern Uplands, Prairie Gateway, Northern Crescent, Southern Seaboard, and the Heartland. Table 6.1 shows that the low primary farm income ranking for the Heartland is due to a low farm income average for commercial farms in the region. The low primary farm income ranking for the Northern Crescent is due mainly to the low farm incomes of the region's intermediate farms. The Eastern Uplands, Prairie Gateway, and Southern Seaboard had relatively low farm incomes for both intermediate and commercial farms.

Table 6.3 expands the value of production data from Table 4.2 and reports the percentage of regional agricultural value of production associated with individual crops separately for intermediate and commercial family farms. These data will be used to examine commodity composition for the regions with low household farm income averages for primary family farms.

The low farm income problem for the Heartland was limited to commercial family farms. Table 6.3 shows that the most important crops produced by commercial farms in the Heartland were corn, soybeans, hogs, cattle, and other crops. The relatively more successful intermediate farms in the Heartland derived more of their gross income from corn and soybeans, and a smaller percentage from hogs, compared to commercial farms in the region.

In the Northern Crescent, the low average farm income of primary farms was due mainly to low farm incomes for intermediate farms. Over 50 percent of the value of production for intermediate farms attributable to dairy, and cattle, corn, and soybeans were also important income sources for intermediate farms. The relatively more successful commercial farms derived a much smaller percentage of their value of production from dairy (30% compared to 50% for intermediates) and much higher percentage values of production from nursery and "other crops".

Table 6.3 Regional Percentage Value of Production by Commodity and Farm Typology¹

<u>Heartland</u>			<u>N. Crescent</u>			<u>N. Grt Plains</u>			<u>Prairie Gateway</u>			<u>E. Uplands</u>		
	<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>
corn	31.5	25.0	dairy	50.9	29.7	cattle	40.6	34.3	cattle	38.2	40.2	poult	13.1	56.8
soybean	25.7	19.6	nursery	4.6	21.4	othcrp	18.4	13.5	corn	10.2	16.4	nursery	7.9	15.1
hogs	3.8	18.6	othcrp	5.9	15.9	wheat	20.0	11.3	dairy	3.3	9.3	cattle	29.3	6.4
cattle	12.5	13.9	veg	4.5	6.2	soybean	7.3	8.3	othcrp	8.0	6.3	dairy	14.7	5.9
othcrp	15.6	10.7	cattle	10.9	5.3	dairy	3.1	6.9	wheat	14.8	5.9	hogs	3.9	4.3
dairy	5.7	4.8	corn	6.9	4.4	corn	5.2	5.6	soybean	6.0	3.5	tobacco	15.4	0.9
othliv	1.3	0.6	soybean	6.3	2.8	othliv	4.4	5.9	poult	5.1	2.7	othcrp	4.7	1.5
wheat	1.2	0.8	fruit	3.8	3.9	veg	0.9	3.8	cotton	4.4	5.4	soybean	2.8	1.4
tobacco	0.9	0.1	hogs	2.2	3.1	sorghum	0.1	0.0	sorghum	4.0	1.9	othliv	2.8	0.0
nursery	0.8	1.3	othliv	2.1	1.4	hogs	0.0	2.4	othliv	3.7	0.4	corn	2.5	3.9

<u>S. Seaboard</u>			<u>Fruitful Rim</u>			<u>Basin and Range</u>			<u>Mississippi Portal</u>		
	<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>		<u>Intermed</u>	<u>Comm</u>
poult	33.2	55.2	veg	5.7	20.9	cattle	54.2	20.3	poult	4.2	18.4
hogs	2.4	16.3	dairy	2.7	20.1	veg	3.3	19.8	cotton	6.0	15.4
nursery	2.2	5.1	fruit	33.7	16.2	othcrp	18.5	16.8	soybean	19.5	15.0
tobacco	21.9	4.9	nursery	9.3	15.1	nursery	2.0	12.6	othcrp	13.6	13.6
dairy	3.5	2.9	othcrp	14.3	13.3	dairy	2.8	9.9	rice	8.0	10.2
cattle	14.0	2.6	cattle	15.1	4.7	wheat	9.4	7.2	cattle	14.1	5.1
othcrp	4.2	1.3	poult	5.6	4.2	fruit	5.4	0.6	dairy	7.4	1.3
cotton	3.4	2.4	othliv	5.5	1.1	othliv	4.2	1.3	corn	7.4	8.2
soybean	3.1	1.4	wheat	3.6	1.0	hogs	0.1	9.1	tobacco	6.0	0.8
peanut	2.9	1.5	rice	2.0	0.4	poult	0.1	1.8	othliv	5.8	3.2

¹Percentage of regional value of agricultural production attributable to each listed commodity for intermediate and commercial family farms.

The Eastern Uplands ranked low in household farm incomes for both intermediate and commercial farms. Important income sources for intermediate farms in this region were cattle, tobacco, dairy, and poultry. Almost 57 percent of the agricultural value produced by commercial farms in the Eastern Uplands was from poultry. Nursery crops provided about 15 percent of production value for commercial farms, and cattle and dairy were much less important commodities for commercial farms than for intermediate farms in the region.

The Prairie Gateway had relatively low household farm incomes for both intermediate and commercial farms. Both intermediate and commercial farms generated about 40 percent of regional production value from cattle. Intermediate farms received an additional 15 percent from wheat and 10 percent from corn, while commercial farms produced an additional 16 percent of value from corn and 9 percent from dairy.

The final region identified as having relatively low household farm incomes for primary family farms was the Southern Seaboard. The majority of production value for commercial farms in this region was derived from poultry (55 %) and hogs (16%). Poultry was also important to intermediate farms in this region, accounting for a third of the value of production for these farms. Tobacco accounted for almost 22 percent of the value of production for intermediate farms in the region, and cattle for about 14 percent.

Commodity impacts on farm incomes may be better understood by comparing the commodity mixes of low farm income regions just described to commodity mixes in regions with high household farm incomes. Tables 6.1 and 6.2 indicate that primary family farms with the highest household farm incomes are commercial family farms in the Fruitful Rim (\$162,429), the Basin and Range (\$159,696), and the Mississippi Portal ((\$94,914). Commodity compositions for these farms are shown in Table 6.3.

Over 50 percent of the value of production on Fruitful Rim commercial family farms was from vegetables (19.8%), fruit (16.2%), and nursery crops (15.2%). An additional 20 percent of value of production on these farms was from dairy while 13 percent was from “other crops”. Vegetables and fruit were not major sources of value in any of the low farm income regions, but nursery crops were important value sources for commercial farms in the Northern Crescent and Eastern Uplands.

Vegetables (19.8%), “other crops” (16.8%), and nursery (12.6%) were important sources of value for commercial family farms in the Basin and Range region. Cattle (20.3%), and dairy (9.9%) were also important for these farms, and these are commodities that were also important revenue sources in regions with low household farm incomes.

The commodity mix for Mississippi Portal commercial family farms was quite different than what was observed for either the high or low farm income regions discussed above. The major commodities for commercial farms in this region were poultry (18.4%), cotton (15.4%), soybeans (15.0%), “other crops” (13.6%), and rice (10.2%). Nursery and vegetable crops and dairy, which were important commodities in the other high farm income regions, were not important in the Mississippi Portal. Cotton and rice, the two commodities with the highest government payment to value of production ratio, were important commodities for commercial farmers in the Mississippi Portal.

Regional Commodity Mixes and Trade Dependence

Heavily traded and/or supported commodities are produced in each of the farm resource regions. However, the importance of each commodity is different for each region, so some regions are more vulnerable than others to changes in trade agreements, exchange rate fluctuations, economic changes in foreign countries, or changes in government support.

As shown in Table 6.4, commodities that are heavily traded include rice, soybeans, wheat, cotton, vegetables, tobacco, and corn. Table 6.4 combines data from Tables 4.2 and 5.1 to highlight the importance of each commodity to the farm resource regions. The table shows the top regional producers of each heavily traded commodity and the regions that derived large percentages of value from each commodity. The table also shows the national percentages of value of production of exports, imports, and direct subsidies; and producer support estimates for each heavily traded or supported commodity.

Of the heavily traded commodities, cotton is produced most in the Prairie Gateway, Mississippi Portal, Fruitful Rim, and Southern Seaboard. About one fourth of U.S. cotton is produced in each of the regions except the Southern Seaboard. Cotton contributed the greatest amount of value of production to the Mississippi Portal (13.4%), but it was not a major source of value in the Fruitful Rim or the Southern Seaboard.

The Mississippi Portal and Fruitful Rim were the top rice producing regions in 2002, and these two regions combined accounted for 95 percent of U.S. production during the reference year. Rice appears to be the most important commodity to the Mississippi Portal. Almost 70 percent of U.S. rice is grown in the Mississippi Portal, and about 10 percent of value of production in the region was from rice. Although the Fruitful Rim produced almost 30 percent of rice, it was not an important source of income for the region.

Soybean production occurred mainly in the Heartland and Northern Crescent. The Heartland produced almost 70 percent of U.S. soybeans in 2002, and derived over 20 percent of value of production from soybeans, while the second largest producer, the Northern Crescent produced less than 10 percent. Soybeans contributed 16 percent of the value of agricultural production in the Mississippi Portal in 2002.

The Southern Seaboard and Eastern Uplands produced the largest quantities of tobacco in 2002. The Southern Seaboard produced almost 60 percent of the total U.S. tobacco produced, and Eastern Uplands produced over 20 percent. Although the regions produced large quantities of tobacco during the reference year, tobacco contributed less than 10 percent of value of production to each of the regions.

The largest value of vegetables was produced in the Fruitful Rim (68.0%). The next largest producer of vegetables was the Northern Crescent; however, this region was a much smaller producer than the Fruitful Rim, producing about 12 percent of the value of vegetables produced in the U.S. in 2002. Almost 20 percent of the total value of agricultural production in the Fruitful Rim was from vegetable production, and over 15 percent of the agricultural value produced in the Basin and Range was from vegetables.

Over sixty percent of U.S. wheat value was produced in the Northern Great Plains and Prairie Gateway in 2002. The Northern Great Plains derived about 14 percent of its total agricultural value from wheat in 2002, and the Prairie Gateway derived about 9 percent of its agricultural value of production from wheat that year.

Regional Commodity Mixes and Government Subsidy Payments and Support

Government support to U.S. producers is also important to the U.S. agricultural sector. Rice, cotton, wheat, and corn had the highest direct government subsidy to value of production ratios of the important commodities. These commodities also had relatively high producer support estimate to value ratios, as did dairy. The two commodities with the highest government payment percentages, cotton and rice, have just been discussed, because they are also two of the most heavily traded commodities. Rice not only has a high government payment

Table 6.4 Important Farm Resource Regions for Heavily Traded or Supported Commodities

<u>Commodity</u>	<u>%Value Exports</u>	<u>%Value Imports</u>	<u>%Value Government Payments</u>	<u>PSE</u>	<u>Major U.S. Production¹ Regions</u>	<u>Regional Value of Production</u>
Cotton	54.4	.54	44.2	N/A	Prairie Gateway (27.4) Mississippi Portal (25.4) Fruitful Rim (25.2) Southern Seaboard (14.5)	MS. Portal (13.4) Prairie Gateway (5.1) Southern Seaboard (2.6) Fruitful Rim (1.9)
Corn	23.1	.13	9.5	17	Heartland (67.3) Prairie Gateway (14.1)	Heartland (27.5) Prairie Gateway (14.1)
Dairy	3.8	7.0	3.4	46	N. Crescent (39.7) Fruitful Rim (33.6) Heartland (9.6)	N. Crescent (36.7) Fruitful Rim (18.1) Eastern Uplands (8.8)
Rice	78.9	17.2	109.6	52	MS. Portal (67.6) Fruitful Rim (27.8)	MS. Portal (9.8) Fruitful Rim (.6)
Soybeans	37.3	.13	4.4	13	Heartland (69.4) N. Crescent (7.3)	Heartland (21.9) MS. Portal (16.0)
Tobacco	61.6	42.1	.29	N/A	Eastern Uplands (59.5) Southern Seaboard (22.5)	Southern Seaboard (7.8) Eastern Uplands (5.7)
Vegetables	29.5	43.8	0.0	N/A	Fruitful Rim (68.0) N. Crescent (11.7)	Fruitful Rim (19.2) Basin and Range (15.4)
Wheat	63.6	4.7	17.2	30	N. Great Plains (30.7) Prairie Gateway (30.1)	N. Great Plains (14.2) Prairie Gateway (9.1)

¹ Major U.S. production regions are the top producers of each commodity and the percentage of the commodity produced in the region

² Regional value of production column lists the regions that received the most value from each commodity and the percentage of value of production in each region from each commodity

percentage, it also has the highest producer support estimate percentage of the important commodities. Producers of these commodities are thus not only vulnerable to the risk associated with trade dependence, they may also be vulnerable to changes in government programs on which they are so dependent. The Mississippi Portal stands out here since it is a major producer of both cotton and rice, and cotton and rice account for almost a quarter of the value of agricultural production in the region in 2002.

Wheat is another commodity with significant trade and government support. The Northern Great Plains and Prairie Gateway are both major producers of wheat. Each of these regions produced over a fifth of U.S. wheat production in 2002, and received the largest value of production from wheat of all the regions. Wheat producers in the Northern Great Plains and Prairie Gateway may also be susceptible to reductions of government support and changes in trade agreements.

Corn is not as heavily traded or supported by government programs as the commodities previously discussed, but corn did receive a relatively higher government payment percentage than some of the other commodities. The Heartland appears to be the only region dependent on corn production since it is a major producer of corn, and corn accounted for almost a fifth of the total value of agricultural production in the region in 2002. Together, corn and soybeans account for almost 50 percent of the Heartland's value of production, and these two crops have significant exports and moderate levels of government support.

Although the government payment measure indicates direct subsidies to dairy are small relative to the value of production, the producer support estimate percentage shows that government intervention other than direct subsidies are important to dairy. Those support programs include market price support, government purchases, marketing order, payments based

on variable inputs such as energy payments, and payments based on the use of on-farm services such as the animal and plant health inspection services. Other types of government intervention important to dairy are state expenditures and payments based on overall farm income. Dairy production is important to the Northern Crescent and Fruitful Rim. These regions are major producers of dairy products, and dairy accounted for almost 40 percent of the total value of agricultural production in the Northern Crescent, and almost 20 percent in the Fruitful Rim. These regions may be vulnerable to changes in government programs.

Conclusions

The objective of this study was to analyze the diversity of farms from a geographic perspective by examining household income data, characteristics of the farm business, and the importance of international trade and U.S. government support to farms and farm resource regions. The following conclusions were drawn from this analysis:

1. Many of the total household income, household farm income, and off-farm income averages were not statistically different across regions, but there were large gaps between the largest regional income averages and the smallest regional income averages. Pairwise differences between regional means were generally only statistically significant between regions with means near the top or the bottom of the distributions. The statistical tests suggest relatively little regional diversity of total household and household farm income for intermediate farms, but more diversity among regions for commercial family farms. The more common significant regional differences in off-farm income averages for intermediate farms suggest that off-farm income averages are more diverse than the other income types across regions.

2. Although there were often limited income differences between regions, there appeared to be large differences between levels of farm and off-farm income for different farm typologies within regions. The total household income, household farm income, and off-farm income averages from rural residence farms to intermediate farms, and from intermediate to commercial family farms often appeared to be quite different within most farm resource regions. The data also revealed that rural residence and intermediate farms are more dependent on off-farm income than household farm income. The average household farm income for rural residence farms for all regions was negative, and for intermediate farms the highest average regional household farm income was around \$7,000. Commercial family farms appeared to be more dependent on farm income than off-farm income.
3. Even though there were not many differences in commodity mixes between many regions, some regions stood out with much different mixes of important commodities. These regions include the Eastern Uplands and Southern Seaboard, Fruitful Rim, and the Mississippi Portal. The prominence of poultry and tobacco make the commodity mix for the Eastern Uplands and Southern Seaboard unique. Poultry, cattle, tobacco, and nursery were important to both regions. The commodity mix for the Fruitful Rim is also unique. The Fruitful Rim derived over 50 percent of its value of agricultural production from vegetables, fruit, and nursery crops. Dairy was also important in the Fruitful Rim. The Mississippi Portal's commodity mix contains commodities that were not important in any of the other regions. Those commodities include rice and cotton. Soybeans and poultry are other important commodities in the region.

4. Diversity related to the importance of trade and government support does exist across the farm resource regions. The Heartland derived about 50 percent of value of production from corn and soybeans, which are heavily traded commodities. The Mississippi Portal stands out because it derived about a fourth of its value of production from two of the most heavily traded commodities, rice and cotton. These commodities are also the most heavily subsidized relative to their value, which makes the Mississippi Portal more vulnerable to changes in trade agreements and possible reductions in government support for agriculture than any other farm resource region. Rice had the highest producer support estimate of all commodities. Dairy had the second highest producer support estimate of 46 which indicates dairy received a high level of government support, excluding large direct subsidies. Dairy production is most important to the Northern Crescent.

Policy Implications

In considering possible changes in the Farm Bill, it is important to first understand what Congress wants to accomplish with the Farm Bill. One of the apparent goals of the current farm bill was to provide income support to farms. Our analysis showed that some farms, commodities, and farm resource regions received large government payments, while others received very little support. The following policy suggestions are made as a result of the observed discrepancies in income support across farms, commodities, and farm resource regions.

1. Program crops including cotton, corn, other feed grains, wheat, and rice are not grown on many farms any more, compared to the situation in the 1930's. However, government programs still tend to focus on these commodities. According to the 2002 Agricultural Resource Management Survey's data, only about 40 percent of all farms

and 60 percent of primary family farms received any government payments in 2002.

If programs that support production of certain commodities are going to exist, diversifying these programs to reflect the commodities that are currently being produced by farms rather than historically supported commodities should be considered. The key question in deciding which commodities to support is why we are supporting producers of commodities at all. What are we trying to accomplish with government commodity payments?

2. Regardless of the region, the needs of rural residence farms are far different from the needs of the commercial farms. For instance, commodity programs do not benefit rural residence and intermediate farms very much because of their relatively low production of agricultural commodities. Instead, off-farm income is very important to these farms. Therefore, the needs of rural residence and intermediate farms could possibly be more effectively addressed by rural development programs to increase off-farm income earnings opportunities for rural residence and intermediate households. In contrast, rural development is not of as much importance to commercial farms.
3. If a primary purpose of agricultural subsidies is to provide assistance to low income farmers, improved targeting of subsidy payments should be a priority in new legislation. Current commodity oriented programs award the largest government payments to the biggest producers. This approach is not the best way to address farm income problems. Mostly, the larger producers are commercial family farmers which, on average, had high total household incomes in all regions during the reference year.

The household income problem for farms seems to be concentrated among intermediate farms. Rural residence farms had total household incomes above the U.S. average income in most regions because of off-farm income. Commercial family farms had high total household income averages mainly because of their high farm income. On average, intermediate households had considerably lower off-farm income than rural residence farms where farming was a secondary activity. Intermediate farm households, on average, also had considerably lower farm income than the larger scale commercial farms. If a major goal of farm policy is to help low-income farms, intermediate farms should be the focus.

The next farm bill could also address large differences in government payments across the farm resource regions. Two extremes that demonstrate these differences are in the Eastern Uplands and Mississippi Portal. Commercial family farms in the Mississippi Portal received \$71,058 in average government payments which was \$30,000 more than the next highest regional average government payment. Commercial family farms in the Eastern Uplands only received about \$11,000. Average household income of commercial farms in the Mississippi Portal was over \$140,000 in 2002. In contrast the Eastern Uplands had the lowest average total household income for commercial farms across all regions, \$67,320 in 2002, and received the lowest average government payment.

4. Some regions appear to be quite dependent on farm programs, which make them very vulnerable to possible decreases in payments from these programs. The Mississippi Portal would be the most vulnerable region if reductions in government commodity programs occurred. Perhaps future policies could improve competitiveness in agricultural production by developing strategies to access new markets and manage

- costs; and provide assistance to farms to partially transition out of farming. Such programs may prove helpful without causing a dependence on government payments.
5. If the most important commodities in a region are heavily traded, this makes the region more vulnerable to changes in trade agreements. Often these producers are exposed to more risk as a result of international trade. Therefore, regions such as the Mississippi Portal, Fruitful Rim, and Heartland may benefit more from programs such as revenue insurance that would reduce some of the risk faced by these farms.

Suggestions for Future Research

Future research for this type of study should focus on more than one year. This would allow for a more detailed analysis of income and commodity characteristics across farms and farm resource regions. Using data for a number of years would also show if the year 2002 was a typical year or an unusual year. Comparing data from the Agricultural Resource Management Survey to other sources of data, and examining the role of agricultural policy in each of the farm resource regions could also prove helpful in future studies. Additional statistical tests between farm typologies could also provide helpful information.

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