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Tobacco and the Economy: Farms, Jobs, and Communities, By H. Frederick Gale, Jr., Linda Foreman, and Thomas Capehart, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 789.

Abstract

Public health policies intended to reduce the incidence of smoking-related disease adversely affect thousands of tobacco farmers, manufacturers, and other businesses that produce, distribute, and sell tobacco products. This report assesses the likely impacts of declining tobacco demand, and identifies the types of workers, farms, businesses, and communities that are most vulnerable to loss of tobacco income and jobs. The dollar impact on the farm sector of a reduction in cigarette demand will be smaller than that experienced by manufacturing, wholesale, retail, and transportation businesses, but tobacco farms and their communities may have the most difficulty adjusting. Many tobacco farmers lack good alternatives to tobacco, and they have tobacco-specific equipment, buildings, and experience. Most communities will make the transition to a smaller tobacco industry with little difficulty, because tobacco accounts for a small share of the local economy. However, a number of counties depend on tobacco for a significant share of local income.

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Summary

Public health policies intended to reduce the incidence of smoking-related illness adversely affect thousands of businesses, workers, and communities that produce, distribute, and sell tobacco products. In recent years, increases in Federal and State excise taxes, restrictions on smoking in public places, price increases resulting from legal settlements, and falling cigarette exports have impacted the tobacco industry. Most of the jobs and income affected by a reduction in cigarette demand are beyond the farm gate in manufacturing, wholesale, and retail businesses, but some tobacco farms and their communities may have difficulty adjusting to declining demand for tobacco. This is because many tobacco farmers lack good alternatives to tobacco, and they have specialized tobacco-specific equipment, buildings, and human capital. Strong economic growth in many of the communities where tobacco is grown and processed has softened the local economic impact of lost tobacco dollars, but in a number of communities, reliance on tobacco income is still relatively high.

The tobacco industry has wide-ranging effects throughout the economy, affecting not only farms and manufacturers, but also wholesale businesses and retail stores. Businesses in other industries that supply intermediate goods, inputs, and services also rely on tobacco. These include companies in diverse sectors such as warehousing, paper, metal products, machinery manufacturing, advertising, transportation, and legal services.

While tobacco leaf is the key ingredient in cigarettes and other tobacco products, its value accounted for only 4 cents of each consumer dollar spent on tobacco products in 1998. About 2.3 cents went to U.S. growers of tobacco, and 1.7 cents represented the value of imported tobacco. Most of the cigarette dollar goes to businesses beyond the farm gate and to government revenues. Manufacturing value-added accounted for 43 percent of the tobacco dollar, a share that increased rapidly during the 1980's and 1990's. Federal and State excise and sales tax revenues accounted for another 26 cents, and wholesale, retail, and transportation accounted for 21 cents of each tobacco dollar.

Tobacco farms vary considerably in size, location, yields, financial condition, and management characteristics. Most tobacco farms are in relatively good financial condition, but they will have difficulty replacing lost income from tobacco. Because the Federal tobacco program limits production and supports prices, tobacco leaf brings much higher returns than most other crop or livestock enterprises. Average returns over cash expenses exceed \$2,000 per acre. Tobacco farms devote 6 percent of their land to tobacco, on average, but they obtain an average of 79 percent of their gross income from tobacco. Farms with low production costs due to good soils, management, size economies, and other factors will be in the best position to survive if tobacco prices decline. Smaller farms, concentrated in the Piedmont region of North Carolina/Virginia and Kentucky/Tennessee, tend to have lower tobacco yields, higher costs, and fewer profitable alternatives to tobacco. Farm operator characteristics, including the operator's age, off-farm work experience, and education, will have important influences on the strategies chosen by tobacco farmers to cope with a declining tobacco market.

Loss of tobacco-related jobs and income will affect hundreds of communities, both rural and urban, that rely on tobacco for part of their economic base. Most communities where tobacco is grown and manufactured will make the transition to a smaller tobacco industry with little difficulty. However, a number of counties, mostly in Kentucky, North Carolina, and Virginia, depend on tobacco for a significant share of local income. These counties have generated relatively few economic alternatives to tobacco.

The analysis is based on a number of different data sources, including the Census of Agriculture, the Annual Survey of Manufactures, and the Agricultural Resource Management Study (formerly called the Farm Costs and Returns Survey).

Tobacco and the Economy

Farms, Jobs, and Communities

H. Frederick Gale, Jr.
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Introduction

Public health policies intended to reduce the incidence of smoking-related diseases adversely affect the tobacco industry. Discussions about tobacco policy are often hampered by a lack of facts about the tobacco industry, how it operates, and how it will be affected by tobacco control policies. This report provides facts about the tobacco industry and its role in the economy, describes the likely economic impacts of declining tobacco use, and identifies the most vulnerable farms, workers, businesses, and communities.

The report begins by briefly describing recent trends in tobacco consumption and production and tobacco's role in the general economy. A statistical portrait of the U.S. tobacco industry is provided, along with a description of the U.S. tobacco program and its effects on tobacco consumption, production, income, and trade. We then discuss various policy initiatives that have been advanced and analyze the likely impacts of such policies. We discuss the adjustments farms and communities will face; identify the most vulnerable farms, businesses, and regions; and discuss types of assistance that might be needed.

Tobacco's Role in the Economy

Consumption and Production

Tobacco is a major U.S. industry. In 1998, consumers spent an estimated \$59.3 billion on tobacco products, chiefly on cigarettes (\$55.7 billion). Much less is spent on cigars (\$1.0 billion), smoking tobacco, chewing tobacco, and snuff (\$2.5 billion combined), but these are also important industries. These consumer expenditures support thousands of businesses that manufacture, transport, market, and sell these products, as well as some 90,000 farms that grow tobacco leaf. Tobacco products are also an important source of tax revenue for Federal, State, and local governments.

U.S. consumption of tobacco products has generally fallen over the past several decades. Per capita consumption of cigarettes peaked in 1963 at 4,345. After the Surgeon General's 1964 pronouncement about the health hazards of cigarette smoking, per capita consumption fell by 44 percent over the next three decades to an estimated 2,261 in 1998.¹ U.S. consumption fell steadily after 1980, but overseas demand grew to keep total production roughly constant until the latter half of the 1990's, when exports began to fall (fig. 1).

Manufacturers mix a number of different types of tobacco in each product they make (table 1). Flue-cured and burley tobacco are the two major domestic types of tobacco used in cigarettes. These are blended with Oriental tobacco (not grown domestically) and a small amount of Maryland tobacco. Most of the other types of tobacco grown in the United States are used in cigars, chewing tobacco, and pipe tobacco products. Tobacco is not a homogeneous product. The flavor, mildness, texture, tar, nicotine, and sugar content vary considerably across varieties or types of tobacco. Defining characteristics of different tobacco types include the curing process (flue-, air-, sun-cured) and leaf color (light or dark), size, and thickness. A given type of tobacco has a different quality depending on where it is grown, its position on the stalk (leaves near the bottom of the stalk are lower in quality), and weather conditions during growing and curing.

Role of International Trade

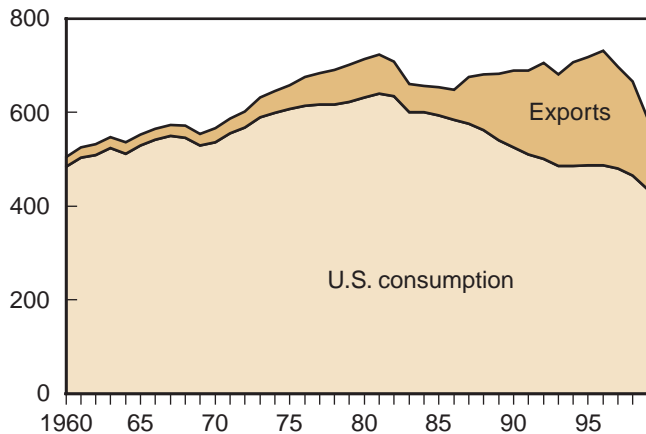
International trade plays an important role in the tobacco sector that must not be overlooked. Exports are

¹Johnson, pp. 59-66, discussed the Surgeon General's 1964 *Tobacco and Health* report in more detail. He summarized studies that have examined the impact of the 1964 report and effectiveness of public policies, such as advertising bans, on smoking. Johnson also pointed out that the decreasing amount of tobacco per cigarette means that the actual consumption of tobacco per capita peaked 10 years earlier, in 1953.

Figure 1

Components of demand for U.S. cigarette production, 1960-69

Billion cigarettes



Source: U.S. Department of Agriculture, *Tobacco Situation and Outlook*, various issues.

an important component of demand for cigarettes. The European Union and Japan are the largest markets for U.S. cigarettes, followed by the former Soviet Union countries, Middle Eastern countries, and other Asian countries. Exports to these markets are relatively unstable, however. In the late 1990's, economic troubles in East Asia and Russia dampened demand for U.S. exports. European demand remained strong, but exports to Europe from the United States fell as some manufacturers moved production from the United States to Europe. U.S. imports of cigarettes are relatively small, but imports are important in the cigar market.

An unusual aspect of the trade picture is the simultaneous export and import of large quantities of tobacco leaf by the United States.² U.S. tobacco is more expensive than tobacco from most competing countries, but quality is also high. Johnson (pp. 104-106) explains how the pricing of different grades in the tobacco price support system may have provided an incentive to substitute imported tobacco for lower quality domestic leaf. U.S. manufacturers blend low-priced foreign cigarette leaf with quality U.S. grades to achieve desired characteristics at lower costs.

²Several large tobacco-growing countries, including China (by far the largest), India, and Pakistan, have a self-contained tobacco economy, where essentially all tobacco products consumed are made with domestically grown tobacco. Japan and most western European countries import most of the tobacco leaf they use to manufacture cigarettes. A number of developing countries are net exporters of leaf.

Consequently, the United States has become virtually the largest importer and exporter of tobacco leaf, importing lower cost grades to round out blends while supplying higher grade leaf to other quality-conscious cigarette manufacturing countries that can afford it. Major export markets for U.S. leaf include Japan, Western Europe (principally Germany, the Netherlands, Denmark, the United Kingdom, Belgium-Luxembourg, Italy, and Spain), Turkey, and the newly industrialized countries of East Asia. In recent years, U.S. farmers have become more concerned about competition from lower priced imported tobacco leaf from Brazil, Malawi, Zimbabwe, and other countries in Latin America. The quantity of U.S. imports is restricted by tariff-rate quotas, which replaced short-lived domestic content provisions in 1995. Oriental tobacco, an important component of American-blend cigarettes, is imported from Turkey, Greece, and other countries of southern Europe.

Where Tobacco Dollars Go

Tobacco dollars support a considerable amount of economic activity in manufacturing, retail and wholesale trade, transportation, and the farm sector. In table 2 we show how the \$52.6 billion spent by U.S. consumers on tobacco products in 1997 was split among the various sectors of the tobacco industry. While tobacco leaf is the key ingredient in cigarettes and other tobacco products, its value accounts for only 4 cents of each consumer dollar spent on tobacco products (table 2). Marketings of U.S.-grown tobacco leaf were \$2.9 billion in 1997, of which about \$1.5 billion was exported, leaving \$1.4 billion worth of U.S. leaf available for domestic manufacture. Imports of tobacco leaf were \$1.1 billion in 1997. Thus, leaf valued at \$2.5 billion from domestic and foreign sources combined was available for U.S. manufacture. After adjusting for exports, we estimate that U.S. leaf represented about 2.3 cents of every dollar spent by U.S. consumers on tobacco products.

Beyond the farm gate, value is added to tobacco leaf by combining it with other inputs and using labor and capital to process, store, market, advertise, and transport it. Businesses also include a markup to make a profit and to cover excise taxes collected from manufacturers and wholesalers.³ Manufacturers combine the estimated \$2.5 billion of tobacco leaf with \$4.2 billion

³Manufacturers pay Federal excise taxes; wholesalers generally pay State excise taxes. Consumers also pay sales taxes on a percentage of retail sales value.

Data Used in This Report

This report assembles data from many different sources to provide a complete picture of the tobacco industry. The data are published by several different government agencies at varying time intervals. We sought to provide the most recent data available from each source, but the years on some statistics differ due to the various publication schedules. In this report, statistics on aggregate production, consumption, exports, and expenditures in the tobacco industry are generally available for 1998. These statistics are published regularly in ERS's *Tobacco Situation and Outlook* report.

We relied on the Census of Agriculture and Economic Census from 1997 to provide more detail on tobacco farms, manufacturers, and wholesale and retail businesses. These censuses are conducted in 5-year intervals. Detailed statistics on merchandise line sales for wholesale and retail trade from the 1997 Economic Census were not yet available when this report was written, so table 3 uses data from the 1992 Economic Census. Data on manufacturing output, wages, employment, and costs for noncensus years were obtained from the Census Bureau's Annual Survey of Manufactures to develop the time series in figure 2.

We used data from special USDA surveys of tobacco farms conducted in 1995 and 1996 to obtain detailed farm characteristics. This annual survey of a sample of U.S. farms is used to estimate costs, income, financial position, and other characteristics. The survey was known as the Farm Costs and Returns Survey (FCRS) until 1996 when it was renamed Agricultural Resource Management Survey (ARMS). Detailed commodity-specific information is collected only at 4- to 5-year intervals. The most recent data for flue-cured tobacco were collected in the 1996 ARMS, and the most recent burley data were collected in the 1995 FCRS. The burley data were collected from a sample of farms in Kentucky and Tennessee, while the flue-cured data were collected from a sample in Virginia, North Carolina, South Carolina, and Georgia. Special tobacco surveys were not carried out in States with relatively small tobacco production, due to the high costs of administering the surveys. Statistics reported here are weighted for stratification.

We obtained county-level data on personal income and employment from the U.S. Department of Commerce's Bureau of Economic Analysis (BEA). BEA's Regional Economic Information System reports detailed annual income and employment data for each U.S. county. These data were available for 1997.

Table 1—Tobacco types, 1998

Kind of tobacco	Quantity ¹	Share	Use	Where grown (domestically)
	<i>Mil. pounds</i>	<i>Percent</i>		
Flue-cured (light)	815.2	54.8	Cigarettes	VA, NC, SC, GA, FL
Air-cured (light)				
Burley	588.2	39.5	Cigarettes	KY, TN, VA, NC, IN, OH, WV, MO
Maryland	15.4	1.0	Cigarettes	MD, PA
Oriental	0.1	a	Cigarettes	not grown domestically
Air-cured (dark)	9.7	0.7	Chewing	KY, TN
Fire-cured (dark)	39.8	2.4	Cigars, chewing	KY, TN, VA
Cigar filler	9.5	.6	Cigars	PA, Puerto Rico
Cigar binder	7.8	.5	Cigars	WI, CT, MA
Cigar wrapper	2.4	.2	Cigars	CT, MA

¹ Production/actual marketings, 1998. Numbers were subject to revision.

a = Less than .1 percent.

Sources: U.S. Department of Agriculture, *Tobacco Situation and Outlook*; Tucker; Grise.

Table 2—Components of the U.S. tobacco industry, 1997

	Value	Share of U.S. tobacco dollar
	<i>Billion dollars</i>	<i>Percent</i>
Farm value of U.S. tobacco	2.9	
- Leaf exports	-1.5	
+ Leaf imports	1.1	
Tobacco leaf available for domestic manufacturing	2.5	4 ³
+ Nontobacco materials ¹	4.2	7 ³
+ Manufacturing value-added ²	26.1	43 ³
- Net exports	-4.5	*
+ Wholesale, retail, and transportation value-added ²	10.8	21
+ Federal excise taxes	5.7	11
+ State and local excise taxes	7.8	15
Consumer expenditures on tobacco	52.6	100

³Exports excluded from calculations.

¹Estimated from *1997 Census of Manufactures*.

²By subtraction. Value of manufactured tobacco products was obtained from *1997 Census of Manufactures*.

³It was estimated that 14 percent of manufactured products were exported and 86 percent were consumed domestically in 1997. Shares of U.S. consumer expenditures were calculated under the assumption that 86 percent of tobacco leaf and other manufacturing inputs were used in domestically consumed products.

Source: U.S. Department of Agriculture, *Tobacco Situation and Outlook*, except where noted.

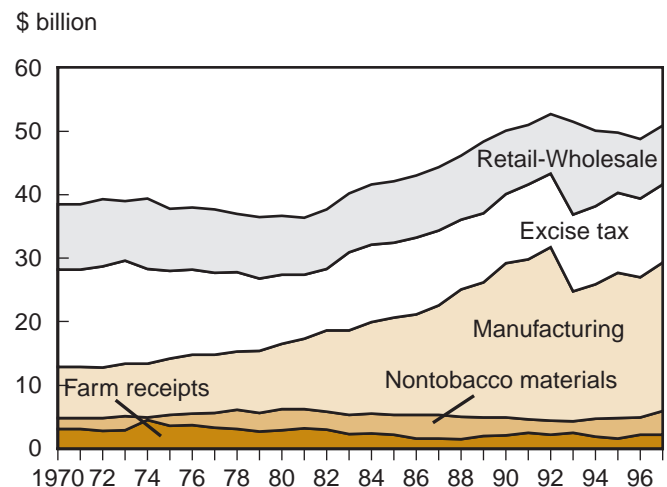
of nontobacco materials (intermediate products or inputs, including paper, filters, cellophane, and other packaging materials). The value added in manufacturing (the difference between the value of products produced, i.e., cigarettes, and the value of raw materials and intermediate products used, such as tobacco leaf, paper, and packaging) amounted to over \$26 billion in 1997, 43 percent of the final value of tobacco products. The value added equals the payments to labor (wages and salaries) and capital (interest, rent, and profits) at each stage of production and distribution. Wages and salaries in manufacturing account for only \$1.6 billion of value added. Advertising accounts for a much larger share—about \$5 billion (Federal Trade Commission). Profits are also a large share.

After manufacturing, governments at the Federal and State levels receive the next-largest share of the tobacco dollar—a combined share of \$13.5 billion in 1997, or 26 cents of every dollar spent on tobacco products by U.S. consumers (exports are exempt from excise taxes). The transportation, distribution, and sale of cigarettes and other tobacco products account for an estimated \$10.8 billion, or 21 cents of each domestic tobacco dollar. Much discussion of the tobacco industry focuses on farming and manufacturing, but wholesale and retail trade are also a large part that cannot be ignored.

Over the past several decades, the manufacturing sector has increased its share of the tobacco dollar sub-

stantially (fig. 2). Manufacturing's share of the tobacco dollar more than doubled from 21 percent in 1970 to 43 percent in 1997. Increased manufacturing value-added accounted for most of the gain in inflation-adjusted cigarette expenditures during the 1980's. In real dollars, spending on tobacco leaf and other materials, and value added in wholesale, retail trade, and

Figure 2
Shares of U.S. consumer tobacco expenditures accruing to various sectors of the tobacco industry, 1970-97



Note: Values expressed in constant 1992 dollars.
Source: Estimated from USDA and U.S. Bureau of the Census data.

transportation remained relatively steady from 1970 to 1997. Real cigarette excise tax revenue fell. In the 1990's, real domestic expenditures on cigarettes declined, halting the rise of manufacturing value added. Deep price cuts in 1993 resulted in a noticeable dip in manufacturing value-added from its peak value of \$27.3 billion in 1992.

The tobacco industry is hourglass-shaped in its structure. Tobacco leaf is funneled from thousands of farms through a handful of leaf wholesalers and manufacturing plants that make cigarettes and other products sold at thousands of retail establishments. In 1997, 89,544 farms grew tobacco, most of them small, family-operated, often part-time, enterprises. Of those, 65,755 grew tobacco as their primary crop. In 1997, there were only 25 tobacco stemming and redrying plants owned by 14 companies. There were 13 cigarette manufacturing establishments owned by 9 companies.

While much attention is given to tobacco farms and manufacturers, less is known about the tobacco wholesale and retail business, which accounts for a large share of the tobacco dollar. In 1992 (the most recent year for which data on wholesale and retail industries were available), 375 wholesale establishments dealt in tobacco leaf (table 3). About 1,700 tobacco products wholesalers handled most wholesale distribution of cigarettes and other manufactured tobacco products.

Grocery and drug wholesalers also handled a significant share. Also, tobacco products were sold by more than 200,000 retail establishments in 1992.⁴ About half of all tobacco products were sold by foodstores, 23 percent by gas stations, 10 percent by general merchandise stores (discount stores and warehouse clubs), 7 percent by drug stores, and another 7 percent by miscellaneous retail stores. Over the years, foodstores and gas stations increased their combined share of tobacco sales from about half in the 1960's to nearly three-fourths in 1992. Most of the increased share came at the expense of eating and drinking places, drug stores, and vending machines, whose combined share fell from 35 to 9 percent over that period. In the 1990's, convenience stores and warehouse clubs were the fastest growing outlets. Convenience foodstores, some of which are classified as foodstores, some as gas stations, accounted for nearly a third of tobacco sales in 1992. These stores are also the most reliant on tobacco sales. Tobacco accounted for nearly 21 percent of sales for convenience stores that did not sell gasoline, and 13 percent for convenience stores that did sell gasoline. By comparison, tobacco accounted for about

⁴ 1997 Economic Census data on wholesale and retail trade were not yet available when this report was written. Thus, we rely on 1992 data, the most recent available.

Table 3—Tobacco wholesale and retail trade businesses, 1992

Type of business	SIC	Establishments ¹	Sales ²	Share ³
		Number	Billion dollars	Percent
Wholesale				
Farm product raw materials	5159	375	3.6	99.6
Tobacco and tobacco products	5194	1,702	31.0	78.9
Groceries, general line	5141	1,155	3.7	6.0
Groceries and related products	5149	287	.5	5.8
Drugs	5122	47	.5	17.3
Retail				
General merchandise	53	12,117	4.9	2.4
Supermarkets	541	68,000	15.8	3.4
Convenience food stores	541	29,400	5.2	20.8
Convenience food/gas stores	541	20,860	3.7	13.1
Gas/convenience stores	554	31,053	6.7	9.7
Other gasoline service stations	554	37,958	4.3	4.8
Drug and proprietary stores	591	29,046	3.5	3.7
Liquor stores	592	18,486	1.6	8.0
Automated merchandise machines	5962	3,252	.7	10.0
Tobacco stores and stands	5993	1,477	.9	78.1

¹ Establishments with tobacco products sales.

² Tobacco products sales reported in the *Census of Retail Trade: Merchandise Line Statistics* were adjusted upward to be consistent with tobacco expenditures reported in *Tobacco Situation and Outlook*.

³ Tobacco as a share of sales for establishments selling tobacco.

Source: 1992 *Census of Retail Trade: Merchandise Line Statistics* and 1992 *Census of Wholesale Trade: Commodity Line Sales*, except where noted.

3 percent of sales in supermarkets, 10 percent of vending machine sales, and 8 percent of liquor store sales. Tobacco stores and stands relied on tobacco products for 78 percent of their sales, but they accounted for only 2 percent of total tobacco sales in 1992.

Employment Supported by Tobacco

Clearly, the tobacco industry has wide-ranging effects throughout the economy, affecting not only farms and manufacturers, but also wholesale and retail stores. Businesses in other industries that supply intermediate goods, inputs, and services also are reliant upon tobacco. These include companies in diverse sectors such as warehousing, paper, metal products, machinery manufacturing, advertising, transportation, and legal services.

The economic importance of tobacco is often measured by the number of jobs that it supports. Two recent industry-sponsored studies reviewed by the U.S. General Accounting Office counted 1.8 million (American Economics Group, Inc.) and 3.1 million (Tobacco Merchants Association) jobs related to tobacco. These studies use accounting techniques and input-output models of interindustry purchases to esti-

mate the “direct employment” in industries directly involved in producing and distributing tobacco products; “indirect employment” in industries that supply goods and services to those industries; and “expenditure-induced” employment created as employees spend their salaries and wages, creating additional demand for goods and services. Nonindustry-sponsored studies using similar techniques also estimated job totals between 1 and 2 million (Gale, 1997b; Warner et al.).

While the tobacco industry certainly provides employment for a large number of people, this type of analysis gives an incomplete picture of the likely economic impacts of a change in tobacco demand. Johnson points out that money that would have been spent on tobacco will not disappear from the economy. It will be spent on other goods and services, taxed, or saved. If tobacco expenditures are shifted to other goods and services, there will be a concomitant increase in demand for those products, subsequently increasing the demand for workers, capital, and other factors of production needed to produce them. Several authors have shown that the net impact is very small (Warner et al.; Irvine and Sims; Gale, 1997b).

Tobacco Policy

This section briefly discusses the most important government policies that are likely to affect the tobacco market (table 4). Most proposed measures are aimed at reducing smoking, either directly or indirectly.

Tobacco policy proposals have been directed at each level of the tobacco industry: consumption, manufacturing, and farming. Restrictions on tobacco advertising and smoking in public places and excise taxes on tobacco products can reduce smoking and tobacco use directly. Other measures seek to compensate governments or other parties for the costs of smoking-related illnesses. The Federal tobacco farm program, by restricting the quantity of tobacco grown and raising its price, plays an important role in tobacco policy. The large number of individuals who benefit from the program indicates the program's importance in tobacco policy debate.

Industry Settlement Payments

During the late 1990's, litigation against manufacturers brought by smokers and State governments seeking compensation for damages and health care costs due to smoking became an important factor influencing the tobacco industry. In 1997, tobacco manufacturers

agreed on a settlement with State attorneys general that called for payments of \$368 billion to settle claims against the industry for smokers' health costs. In exchange, the industry would have received protection from future civil suits, eliminating considerable uncertainty over future legal liabilities. Several bills were introduced in Congress to implement the settlement, but negotiations broke down in June 1998, and the 105th Congress did not pass comprehensive tobacco legislation.

Subsequently, in November 1998, tobacco manufacturers and State attorneys general agreed to a scaled-back settlement that would pay 46 States, the District of Columbia, and various territories \$206 billion over 25 years to compensate them for costs of treating smoking-related illnesses and fund antismoking programs. Four States had already reached individual settlements. The agreement called for manufacturers to pay \$1.5 billion over 10 years to support antismoking measures plus \$250 million to fund research into reducing youth smoking. Manufacturers also agreed to limitations on advertising, bans on cartoon characters in advertising and on "branded" merchandise, limits on sporting event sponsorship, and disbandment of tobacco trade organizations. Unlike the earlier settlement, this one did not require Congressional approval, since it did not

Table 4—Tobacco policy instruments

Policy instrument	Description	Effect on tobacco market
Smoking restrictions	Prohibitions on smoking in workplaces, restaurants, and other places. Antismoking campaigns.	Reduces demand for tobacco products.
Excise taxes	Tax assessments per unit of tobacco products. Federal taxes paid by manufacturers. State taxes paid by wholesalers.	Manufacturers and wholesalers raise price of tobacco products to cover all or part of tax liabilities. Higher price passed on to consumers reduces demand for tobacco products.
Settlement payments	Payments from manufacturers to State governments or other entities to settle legal claims.	Manufacturers raise prices to cover all or part of settlement costs. Higher prices are passed on to consumers, reducing demand for tobacco products.
Food and Drug Administration (FDA) regulation	FDA could limit levels of tar and nicotine in cigarettes and issue labeling, recordkeeping, and manufacturing regulations if given authority to do so by Congress.	May force manufacturers to eliminate some products. Costs of compliance may be passed on to consumers. Could reduce overall demand and shift the mix of leaf types toward lower tar and nicotine content.
Elimination of tobacco program	Price supports and marketing quotas eliminated.	Lower leaf prices, but removal of restrictions on planting and marketing, frees up efficient producers to expand. Quota owners lose rental income. Manufacturers benefit from lower leaf prices. Leaf exports rise.

Source: Information assembled by ERS.

place limits on private lawsuits or change FDA jurisdiction. The slightly narrower scope of the current agreement reflects its more limited goals: reimbursing States for smoking-related health costs under Medicaid and ending the uncertainty of continuing lawsuits for cigarette manufacturers. The Federal Government was not a party to the November 1998 settlement, and Congress voted in 1999 to prohibit the Federal Government from making a claim to the settlement payments. On September 22, 1999, the Department of Justice filed a wide-ranging civil suit against the three largest tobacco manufacturers, alleging that cigarette companies conspired to defraud and mislead the public about the health hazards of smoking. The suit seeks to recover expenditures made by the Federal Government to treat smoking-related illnesses of military veterans, Medicare patients, and Federal employees. The suit will also attempt to force cigarette companies to finance education and other antismoking programs.

The above-mentioned "Phase I" settlement did not address the impacts that the settlement would have on growers and owners of tobacco quota. Subsequently, cigarette manufacturers agreed to a "Phase II" settlement, in which they would pay growers of cigarette tobaccos \$5.15 billion to compensate them for losses due to declining cigarette demand. Payments are to be distributed between States based on relative quota or, for nonquota States, production. At the writing of this report, States were determining how the payments would be distributed to individual farmers. Several States set up boards that include farm representatives to oversee disbursement of the funds.

Industry payments have an effect similar to that of an excise tax. Manufacturers generally raise prices to cover the payments, passing on the costs to smokers. During 1998, for example, cigarette manufacturers raised wholesale prices 14 percent, motivated largely by anticipated multibillion-dollar settlements of lawsuits. A 45-cent-per-pack increase was announced immediately following the November 1998 settlement. Higher cigarette prices could cause consumption to slide as much as 25 percent in 10 years compared with 17 percent at the current rate of decline. Lower cigarette consumption will dampen demand for tobacco leaf.

Antismoking Measures

Restrictions on advertising and mandatory warning labels on packaging and advertisements were adopted following the 1964 Surgeon General's *Tobacco and*

Health report. There has been discussion about broadening restrictions on cigarette advertising and strengthening warning labels to further reduce smoking. The 1998 global settlement between State attorneys general and manufacturers placed further restrictions on advertising. Restrictions on smoking in public buildings and workplaces have been expanded in recent years.

The effects of antismoking programs and smoking restrictions are likely to further reduce the demand for tobacco products. In response to shrinking domestic demand, manufacturers will reduce the scale of their domestic operations and their purchases of tobacco leaf and other inputs. If overseas markets grow, manufacturers would probably increase export sales, partially offsetting the impact of reduced domestic demand. However, overseas growth is uncertain since other countries are also instituting antismoking measures. As antismoking measures reduce demand for cigarettes, a proportional decrease in demand for tobacco leaf is also expected. According to Brown's (1995) estimates, a significant increase in smoking restrictions (such as banning smoking in all workplaces) could result in a 4-percent reduction in manufacturers' purchases of tobacco leaf. Gross income to tobacco farmers would fall 2 percent, assuming that the current tobacco program is maintained.

Antismoking efforts have contributed to the decline in smoking in recent years, but an array of other factors have also contributed, including demographic trends and price increases. Over the decade from 1988 to 1998, U.S. consumption fell from 563 billion pieces to an estimated 470 billion. Declining demand brings about a gradual shrinkage of the industry; movement of workers, land, capital, and other resources out of the industry; and consolidation of remaining businesses and farms.

Excise Taxes

Tobacco has been taxed throughout most of the history of the United States, and individual States have taxed cigarettes since the 1920's and 1930's. Manufacturers (in the case of Federal excise taxes) and wholesalers (State taxes) pay these taxes. The Federal tax is currently \$17 per thousand cigarettes (34 cents per pack of 20). State taxes vary considerably from 2.5 cents per pack in Virginia to \$1.00 per pack in Alaska and Hawaii, with a weighted average of 34 cents per pack. Local taxes are in force in some places, and sales taxes are assessed on cigarettes in most States. Excise taxes

are largely passed on to consumers by raising the retail price of cigarettes. Tobacco consumers bear most of the incidence of excise taxes because their demand for cigarettes is relatively insensitive to price. Federal excise taxes increased from 24 cents per pack to 34 cents in year 2000, and are slated to increase again to 39 cents in 2002. Various States also have excise tax increases before their legislatures. Large Federal excise tax increases of \$1.50 per pack or more have been considered.

An increase in the Federal excise tax on cigarettes induces manufacturers to raise wholesale prices to pass on the tax. Studies of cigarette demand find that consumption is inelastic with respect to price—a 10-percent increase in cigarette prices will reduce demand by only 4 to 5 percent. Consequently, manufacturers lose relatively little volume when they raise prices. The oligopolistic nature of the cigarette industry also gives firms considerable power in setting prices. This means that manufacturers can pass on cost increases, such as excise taxes or settlement payments, to consumers through higher prices. In a 1999 study published by the North Carolina Rural Development Center, the authors assumed that 70 percent of cost increases are passed through in price increases. Recent trends in prices seem to bear this out. Cigarette prices have risen rapidly since 1980, faster than costs of materials and excise taxes (Howard, Congelio, and Yatsko). After agreeing to a legal settlement with 46 States in November 1998, manufacturers immediately announced a price increase of \$0.45 per pack to offset expected costs of the settlement. This suggests that manufacturers pass on most, if not all, of an excise tax increase to consumers. It should be noted, however, that cigarette manufacturers have sometimes cut prices in the past for strategic reasons to gain market share and to compete with off-price brands. Nevertheless, it seems likely that excise tax increases will result in longrun increases in wholesale and retail cigarette prices. The Federal excise tax increase in 2000 (10 cents) and that scheduled for 2002 (5 cents) are likely to speed up the expected decline in domestic cigarette consumption.

FDA Regulation of Tobacco Products

Another measure that has been the subject of discussion, legislation, and litigation is the Food and Drug Administration's (FDA) assertion of authority to regulate the manufacture and distribution of tobacco products. Regulations issued by FDA in August 1996 asserted jurisdiction over cigarettes as medical devices,

and would require companies to comply with a wide range of labeling, reporting, recordkeeping, manufacturing, and other requirements. Under these regulations, FDA could force manufacturers to reduce levels of tar and nicotine in cigarettes, and, possibly, ban nicotine altogether. However, in a February 2000 decision, the U.S. Supreme Court ruled that existing law does not grant FDA the power to regulate tobacco. Thus, FDA will not have regulatory authority over tobacco unless Congress passes legislation that specifically grants such authority.

Some public health advocates and policymakers have recommended controls on exports of cigarettes. Advocates of export controls are concerned that restrictions on smoking in the United States will induce manufacturers to sell more cigarettes abroad, thus, in effect, "exporting" public health problems. A bill proposed by Senator John McCain in 1998, but never passed, contained requirements that cigarettes made for overseas markets comply with U.S. warning label provisions, and would have barred export of tobacco products not complying with FDA standards. Opponents of export controls argue that manufacturers would respond by moving their operations overseas.

Tobacco Farm Program

The Tobacco Farm Program is probably the most complex intervention in tobacco markets (see Appendix 1, "The Tobacco Farm Program"). The program determines how changes in tobacco demand are transmitted to the farm sector. It also has an important impact on the structure of the industry and preserves historical production patterns. The program has been the subject of considerable controversy, and its elimination is a serious policy option.

The program limits the quantity of tobacco grown in the United States by assigning marketing quotas to holders of tobacco allotments. Supply is managed by setting annual quotas in line with expected demand for leaf. Quotas are apportioned to allotment holders based on historical production patterns that existed in the 1930's at the program's inception. Since the 1960's, tobacco quota owners have been allowed to rent or lease quota to others, so that today many owners of quota do not grow tobacco. About half of the tobacco quota is used by the people who own it. The other half is rented to farmers for either cash payments or shares. Without the supply limits mandated by the program, producers would grow considerably more

tobacco, pushing down market prices and returns. Zhang, Husten, and Giovino estimate that the tobacco program raised the price of tobacco by 32 to 40 cents per pound (18-23 percent) above what it would have been without the program in the early 1990's. Because tobacco returns are so attractive, a tobacco quota (the right to grow and market tobacco) is a valuable capital asset. Economic theory suggests that a quota for a pound of tobacco is worth the difference between the price and the economic cost of producing it.⁵ Farmers who own quota earn higher returns than they could from other crops. Net returns from tobacco over cash expenses are about \$2,000 per acre in most years, and farmers pay roughly 35 cents per pound to rent quota. On a farm with yields of 2,000 lbs. per acre, the quota rental would be \$700 per acre. At a lease rate of 35 cents, the average flue-cured allotment of 24,250 pounds would bring an annual rental income of \$8,487.50 to its owner, and an average burley allotment of 3,500 pounds would be worth \$1,225. Quota rental rates tend to rise and fall with tobacco prices. As higher prices increase the anticipated profitability of the tobacco crop, growers are willing to pay more for quota. Therefore, growers who rent their quota may not benefit very much through direct income enhancement since their quota rental payments rise with tobacco prices. The benefits accrue largely to those who own tobacco quota. Growers do benefit from the program's effect of stabilizing year-to-year fluctuations in prices, which reduces their risk and helps them obtain financing.

International trade in tobacco leaf has important effects on, and is affected by, tobacco policy. The price enhancement due to the program induces manufacturers to substitute imported for domestic tobacco and makes U.S. leaf less competitive on world markets. As discussed earlier, U.S. tobacco has maintained a surprisingly large world market share, despite its high price. However, manufacturers have been increasing their use of imported tobacco due to the price differential, the improving quality of foreign leaf, and increasing preference for low-tar and generic brand cigarettes, which use imported leaf more heavily. In 1993,

⁵The economic cost includes the opportunity cost, or the income that could have been earned by devoting the farm's land, labor, and capital to the best alternative activity (for example, growing another crop or working off the farm).

Congress passed a domestic content law that required manufacturers to use at least 75 percent domestic leaf in U.S.-manufactured cigarettes. That law was found to be inconsistent with the General Agreement on Tariffs and Trade. The domestic content law was replaced with a tariff rate quota (TRQ), which assesses a 350-percent duty on imports beyond a fixed quota and has a duty drawback for re-exported products. By 1998, the TRQ had never been reached. Beghin, Brown, and Zaini conclude that leaf import restrictions raise domestic use and price of U.S. tobacco, reduce U.S. cigarette output by a small amount (less than 1 percent), and may play a minor role in pushing cigarette manufacturers to relocate production offshore.

The Tobacco Farm Program increases the political complexity of tobacco policy by increasing the number of individuals who benefit from tobacco production. Without the program, there would be far fewer tobacco farms than the nearly 90,000 counted in 1997. There are about 325,000 owners of tobacco allotments/quotas, many of whom are included in the 90,000 growers, but most quota owners rent their quota to others. The income enhancement of the tobacco program amounts to an income transfer to owners of quota from tobacco manufacturers (by reducing their profits), smokers (by raising the price of cigarettes), and foreign buyers of tobacco (Johnson, p. 28). For growers who do not own quota, much of the program's benefit is bid away in the rent they must pay to obtain quota.

The increasing sentiment for antismoking measures and deregulation of farming in the late 1990's led to serious proposals to privatize or eliminate the tobacco program during debate over the tobacco settlement in 1998. Growers of each type of tobacco vote to participate in the program. Several types of tobacco (Maryland, Pennsylvania filler, and Connecticut binder) are already grown without price supports because growers voted against quotas. While continuation of the tobacco program is uncertain, it has survived a number of challenges over the years. Its net-cost provisions have muted criticism of the program as an unnecessary subsidy. Many public health advocates, once among its chief critics, now support the program, having recognized that the program limits tobacco production and raises its cost—effects that are consistent with public health goals.

Impacts of Declining Demand

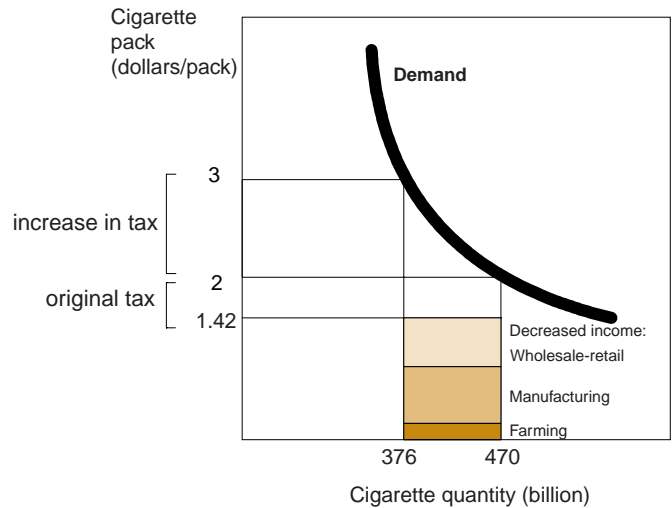
If recent trends continue, domestic demand for cigarettes will likely fall 17 percent from 1998 to 2008. If cigarette exports remain constant, this would amount to a decline in total demand (domestic and foreign) for U.S. cigarettes of 13 percent over the 1998-2008 period. As expenditures on tobacco products fall, the demand for workers, capital, land, and other factors used in the production and distribution of tobacco will fall. Demand will expand in other sectors as consumers shift spending away from tobacco products to other goods and services or tax payments.

To illustrate this process, we provide a simple analysis of the impacts of a \$1-per-pack increase in cigarette excise taxes on revenue and employment in various sectors of the economy. The effect of price increases tied to tobacco settlement liabilities would be similar. The 1998 data shown earlier in table 2 are used as the basis for the calculations, assuming an initial price per pack of \$2 (including excise taxes of \$.58) and initial consumption of 470 billion cigarettes. To simplify the analysis, we assume no changes in exports, tobacco leaf prices, and proportions of domestic and imported leaf used in cigarettes. There is much uncertainty about how these variables will change over time. The actual process would occur over a number of years and would be more complex than described below. The purpose is to provide a rough gauge of how large the effects might be.

If a \$1-per-pack increase in excise tax from \$.58 to \$1.58 were passed on to smokers, it would raise the average retail price of a pack to \$3, a 50-percent increase. Using elasticities of demand in the range of -0.4 to -0.5, this implies that consumer purchases of cigarettes would decline by 20 to 25 percent (table 5).⁶ Total spending on cigarettes would rise by \$5.9 billion if the elasticity is -0.5 or \$9.4 billion if the elasticity is -0.4. Government revenues (through tax collections or industry settlement payments) would rise \$15.6 to \$13.7 billion. Gross revenue to the tobacco sector (net of taxes) would fall by \$6.2 billion to \$7.8 billion (the shaded areas in fig. 3). If we assume that the various sectors maintain a constant share of the cigarette dol-

⁶ "Estimates of the retail price elasticity of demand for cigarettes range from -0.28 to -0.80, with most clustering between -0.40 and -0.75." (Brown, Snell, and Tiller) Earlier studies have generally used elasticities in the range of -0.40 to -0.50, but a recent study by Becker, Grossman, and Murphy estimated a longrun elasticity of -0.75.

Figure 3
Effects of a \$1 excise tax increase on demand for tobacco products



Note: Cigarette prices are per pack of 20. Analysis assumes that excise taxes are passed on fully to consumers. Wholesale-retail, manufacturing, and farming are assumed to maintain equal shares of tobacco revenues.

lar, then wholesale, retail, and transportation businesses (as measured in table 2), would lose \$1.5 billion to \$1.9 billion of income and manufacturers would lose \$3.9 billion to \$4.9 billion. This assumes that cigarette exports remain stable and prices net of taxes remain constant. If manufacturers decrease their demand for U.S. and imported leaf proportionally, and if leaf prices do not change, a decline in purchases of U.S. leaf in the range of \$212 to \$265 million would result (the dark-shaded area in fig. 3). Assuming that leaf exports do not change, this would amount to a 7- to 9-percent decrease in gross receipts. The percentage decline in farm income is much less than the percentage decline in domestic cigarette purchases because we have assumed that exports of cigarettes and leaf do not change.

Impacts on Businesses and Employment

We analyzed these changes in tobacco revenues with an input-output model of the U.S. economy to estimate the magnitude of employment impacts. We report these employment impacts to provide an indication of how many workers may be adversely affected by a decline in tobacco production. Sectors that are the recipients of government spending may create additional jobs to offset the job losses shown below. (Increased tax revenues may support additional government spending, reduce government borrowing, or

Table 5—Effects of a \$1 increase in cigarette price

Variable	Unit	Low	High	Assumptions
Price change:				
per pack	Dollars	1	1	Entire tax passed on to consumers
percentage change (retail)	Percent	50.0	50.0	
Elasticity of demand	NA	-.4	-.5	
Change in U.S. demand for cigarettes	Percent	-20.0	-25.0	
Change in:				
Consumer expenditures	Bil. doll.	9.4	5.9	
Tax revenue	Bil. doll.	15.6	13.7	
Tobacco sector gross income	Bil. doll.	-6.2	-7.8	Price net of tax assumed constant
Wholesale, retail	Bill. doll.	-1.5	-1.9	1996 share of sector receipts constant
Manufacturing receipts	Bill. doll.	-3.9	-4.9	Exports, price (net of tax) assumed constant
Domestic tobacco farms	Mil. doll.	-212.4	-265.4	1996 share of sector receipts constant, leaf prices constant, import share constant
Employment effects	1,000 jobs	-74.7	-96.8	Estimated with input/output model
Employment by sector:				
Agriculture	1,000 jobs	-11.6	-15.1	
Mining and construction	1,000 jobs	-1.4	-2.0	
Tobacco manufacturing	1,000 jobs	-4.6	-5.9	Assumed 1996 ratio of employment to output
Other manufacturing	1,000 jobs	-9.7	-12.8	
Transportation, communications, public utilities	1,000 jobs	-2.8	-3.7	
Retail, wholesale, transportation	1,000 jobs	-34.3	-43.4	
Services and other	1,000 jobs	-10.4	-13.9	

Source: Calculated by ERS using 1997 data from *Tobacco Situation and Outlook*, table 2, and IMPLAN input/output analysis.

allow reductions in other taxes.) Warner et al., Gale (1997b), and Irvine and Sims (for Canada) have used this approach to show that there would be very little net change in employment due to a shifting of tobacco expenditures to other industries.⁷ There are, however, important shortrun adjustments for vulnerable regions, businesses, and workers; and regions are affected disproportionately. New jobs created by diverting tobacco dollars to other sectors are thinly distributed around the country (depending largely on how governments decide to spend excise tax revenues), while losses are heavily concentrated in tobacco growing and manufacturing areas of the Southeast (Warner et al.).

A \$1 increase in cigarette excise taxes could affect an estimated 74,700 to 96,800 jobs (table 5). These jobs include workers directly involved in the tobacco sup-

ply chain (farming, manufacturing, distribution, storage, and sales), as well as workers in supporting industries that supply the tobacco industry with inputs and materials. About 5,000 jobs might be lost in tobacco manufacturing, including tobacco stemming and redrying. (Cigarette manufacturers have already cut employment in recent years through early retirements and layoffs.) A cut in production of this magnitude could result in the closure of one or more manufacturing plants, as manufacturers consolidate production in the most up-to-date and productive plants and move some export production offshore. Manufacturers have claimed that large industry payments specified in proposed comprehensive tobacco legislation could push one or more companies into bankruptcy. Other manufacturing industries, including those that supply paper, packaging, chemicals, equipment, and machinery to the tobacco industry, might lose 9,700 to 12,800 jobs.

The model suggests that 11,600 to 15,100 farming jobs would be lost, but it is difficult to precisely estimate employment impacts on farming. Most tobacco farming jobs are part-time, and much of the decline in tobacco production would be achieved by tobacco farmers' retir-

⁷An important aspect of declining cigarette consumption not considered in these studies is complementarity between cigarettes and other goods and services, which would cause expenditures on related products to decline along with cigarettes. Moore, for example, found evidence of complementarity between smoking and beer consumption. Opponents of smoking restrictions have argued that eating and drinking establishments suffer significant loss of business due to restrictions on smoking in public places.

ing or switching to other farm enterprises. The largest share of jobs affected would be in the 34,300-43,400 retail and wholesale establishments that sell tobacco products. Retail activity is distributed widely across the country in proportion to the number of smokers in each locality. California has the highest cigarette sales (measured in packs), followed by Texas, Florida, Ohio, New York, and Pennsylvania. Wholesale activity is also widely distributed. Service establishments, including those in business, financial, and personal services, would also have at least 10,000 jobs affected.

Farm Impacts

Under current policy, decreases in demand for U.S. tobacco are transmitted to the tobacco farm sector by cutting tobacco quotas, while prices are maintained at relatively high levels. The tobacco price support is determined largely by an average of past years' prices and a cost-of-production index, which keeps it from falling rapidly in response to demand changes. As demand for tobacco products falls, manufacturers submit lower purchase intentions for tobacco leaf, which figure prominently into the formula for setting annual tobacco quota.⁸ Each individual's quota is then decreased proportionally. Maintaining the price of tobacco at a relatively high level keeps the returns to growing tobacco (and consequently the value of a tobacco quota) high. Since there is no price signal to induce resources to exit tobacco production, quotas are cut to prevent surpluses from accumulating. As a result, the loss of production and income is more or less spread proportionally across all producers and regions.

Brown and Martin found that responding to decreased demand by cutting price supports could result in less income loss to tobacco-growing areas than would a policy of cutting quotas and maintaining the price support at a high level. The key assumption in Brown and Martin's analysis is that a lower price would increase export demand for U.S. leaf, partly offsetting lost domestic demand.

A lower tobacco price is undesirable for owners of quota, because quota lease rates would fall. However, reducing the amount of tobacco quota increases quota lease rates. Restricting the number of pounds of quota, while keeping its per-pound value constant, drives up

the price, or lease rate, of quota. Thus, quota owners would prefer that falling tobacco demand be met by decreases in quota rather than decreases in the price support. Brown and Martin conclude that growers who rent most of their quota would fare better under a policy of allowing the price support to fall, while growers who own most of their quota would benefit from maintaining the price support and cutting quotas to absorb a decline in demand.

Brown and Martin conclude that it is unlikely that the tobacco legislation would be changed to allow price supports to decline in response to shrinking demand. In the current political environment, elimination of the tobacco program altogether seems more likely than changes in the parameters of the program. Elimination of the program could have greater impact on the tobacco industry than would most other policy changes. Removal of price supports and quota restrictions on production and marketing of tobacco would result in increased tobacco production and lower prices (Brown, 1997, 1998; Brown, Snell, and Tiller, 1999; Gardner, 1997; Sumner and Alston, 1985). Owners of tobacco quota would lose quota rental income (if they rent their quota to others) or experience lower net farm income (if they use quota to grow tobacco themselves). However, elimination of the program could include compensation to quota owners. (Buyouts of tobacco quota were included in several proposals for comprehensive tobacco legislation considered by Congress in 1998.) Without the program, many small, high-cost growers would no longer be competitive; but low-cost producers would remain in the sector and expand their tobacco acreage to spread their fixed costs over a larger number of tobacco acres (thus reducing costs per unit of output). U.S. farmers could produce considerably more tobacco if they were not constrained by quotas and the program's requirement that only half of a farm's tillable acreage can be planted in tobacco. However, in many areas, a lack of curing barns and labor would be constraints to expansion. In the long run, tobacco production would likely shift to eastern North and South Carolina and southern Georgia, where capacity for expanding tobacco acreage is particularly large (Brown, 1997; Sumner and Alston, 1985). A later section of this report uses national survey data on tobacco farms to illustrate the differences among regions

Gardner's analysis of the elimination of the tobacco program concludes that tobacco production would rise 8 percent and the price of tobacco leaf would fall 18

⁸For example, following the announcement of the November 1998 settlement and a 50-cent increase in wholesale prices, most manufacturers reported steep decreases in purchase intentions in anticipation of slower domestic sales.

cents per pound (9 percent). Consistent with the Brown and Martin analysis, Gardner anticipates that most of the added production would be exported. Domestic tobacco could also displace some imported leaf in cigarette production if the price fell. Sumner and Alston's earlier study found similar but much larger effects, which Gardner attributes to the higher levels of support provided by the tobacco program during the early-1980's period when the Sumner-Alston work was done. The net effect on burley production of eliminating the tobacco program is uncertain, but flue-cured production could increase 40 to 50 percent (Brown, 1998). Previous work indicates that demand

for flue-cured tobacco is more responsive to price changes than is demand for burley tobacco (Brown, Snell, and Tiller). Thus, if tobacco price supports were removed, demand for flue-cured tobacco would increase substantially, while demand for burley tobacco would rise only modestly. Total gross income to flue-cured farmers would rise (production would likely rise enough to offset the decline in price), while gross income to burley growers would fall. The negative impact of program elimination would fall largely on owners of quota, while income to growers who rent all of their quota would rise. (They would no longer need to pay for quota.)

Vulnerable Workers, Businesses, and Communities

While many workers, businesses, and regions will be able to switch to other activities that can replace lost tobacco income, others will have a more difficult time. Economists use the concept of “economic rent” to measure the extent of economic losses due to reallocation of resources. Economic rent is the difference between what a factor of production earns in its current employment (wages, interest or rental payments) and the factor’s opportunity cost (what it could earn in its best alternative use). Workers, land, machines, or other factors that are specialized in tobacco production or farmers who have made large investments to increase their farms’ productivity will have much higher earnings in tobacco production than they would in an alternative occupation. For example, seniority, training, and experience on the job make workers more productive and more highly paid in a particular job than they would be elsewhere. If the experience and skills are not transferable to other industries, then economic rent is high, and workers’ “welfare loss” is large if they are forced to shift to another activity. Workers with general skills that are demanded by nontobacco industries and businesses and communities experiencing income growth from nontobacco sources will have small economic rents and welfare losses. In the discussion that follows, we identify the types of workers, businesses, farms, and communities that are most vulnerable to loss of tobacco income.

Which Workers Will Be Affected?

Based on the economic rent criterion, cigarette-manufacturing employees are the one easily identifiable class of employees beyond the farm gate earning significant rents from tobacco. The roughly 20,000 cigarette-manufacturing workers are among the highest paid workers in the manufacturing sector. According to Bureau of Labor Statistics data, 1998 cigarette-manufacturing wages averaged \$24.34 per hour. The average wage for all manufacturing was \$13.49. If we estimate the economic rent to a manufacturing worker as the difference in wages ($\$24.34 - \$13.49 = \$10.85$ per hour, or \$21,700 per year, based on 2,000 hours per year), the total loss to these workers would be \$434 million per year if the tobacco industry disappeared. On the other hand, workers in cigar (SIC 2121), chewing and smoking tobacco (SIC 2131), and stemming and redrying (SIC 2141) manufacturing earn several thousand dollars less than the average for all manufac-

turing workers. Similarly, workers in the tobacco wholesale trade (SIC 5194) earn less than the average for all wholesale industry workers. Retail outlets that sell tobacco products generally pay at or slightly above the minimum wage, and many jobs are part-time. Annual wages per employee at grocery stores and gasoline stations (the two leading outlets for cigarettes) averaged \$9.83 and \$7.83 per hour, respectively, in 1998. Wages in tobacco stores and stands (SIC 5993) are exactly equal to the average for all retailing. These figures suggest that few tobacco industry employees outside of cigarette manufacturing earn economic rents from the manufacture and distribution of tobacco.

Owners of Tobacco Quota

As discussed above, the policy of cutting quotas while keeping price supports high tends to insulate owners of tobacco quota from the effects of falling demand because quota rental payments rise. However, quota owners would bear much of the impact if prices were allowed to fall or if the tobacco program were eliminated, because the economic rents accruing to quota owners would disappear. These rents can be measured by the rental rates paid for tobacco quota. Official statistics on quota leasing are not regularly reported. We analyzed 1995 Farm Cost and Returns (FCRS) data for burley tobacco and 1996 Agricultural Resource Management Study (ARMS) data (see box, “Data Used in This Report,” p. 3.) for flue-cured tobacco to look at regional variation in quota leasing.⁹ The weighted average quota lease rate for burley tobacco in 1995 was 33 cents per pound; and flue-cured quota rented for a weighted average of 37 cents per pound in 1996.¹⁰ However, lease rates vary considerably due to differences in production costs and the relative supply and demand for quotas in different counties. In 1995, burley quota rented for an average of 45 cents per pound in Kentucky, but only 20 cents per pound in Tennessee (table 6). In a few counties (mostly in Tennessee), production of tobacco has become uneconomic, and quota goes unused. Flue-cured lease rates (for 1996) varied less across regions (see Appendix 2,

⁹Burley farm data are for 1995, and flue-cured farm data are for 1996 because special surveys of those farm types were conducted in those years.

¹⁰These average lease rates are weighted by pounds of production. Larger farms tend to report higher lease rates, so the averages reported here are higher than a simple unweighted average. These averages are broadly consistent with quota rents reported by Brown, Snell, and Tiller.

“Tobacco-Growing Regions”). The weighted averages were 34 cents per pound in the Piedmont of North Carolina-Virginia, 35 cents per pound in the Pee Dee-Lumber River region of eastern North and South Carolina, 38 cents per pound in Georgia, and 39 cents per pound in the Coastal Plain of North Carolina.

Of the total 325,000 tobacco quotas, about 250,000 are for burley and 42,000 are for flue-cured, with the remainder for chewing, smoking, and cigar tobaccos. Many owners of quota are growers, but many retired farmers and other individuals receive rental income from tobacco quotas. The proportion of quota rented varies across regions, from about three-fourths in the Pee Dee-Lumber River and Coastal Plain regions to 51 percent in the Piedmont region (table 6).

A tobacco quota can be viewed as a financial asset that yields a stream of future income through its rental. If a quota is expected to yield 35 cents per pound annually forever, its capitalized value is \$5.83, assuming a 6 percent rate of return on competing investments. However, market values for tobacco quota reflect heavy discounting of future rental receipts due to the uncertainty of those receipts (Gardner). Capitalized values of tobacco quota tend to be around 4.5 times the annual rental rate. In comparison, an annuity discounted at 6 percent interest would have a capitalized value 16.7 times its annual return. Flue-cured quota sales prices averaged \$1.70 in 1991 (when lease rates averaged 33 cents) and \$1.09 in 1987 (when lease rates were 27 cents) (Clauson and Grise, 1994). Womach (1998) reported an estimate of \$1.87 for bur-

ley quota in Kentucky. By comparison, discussions of tobacco settlement legislation in 1998 included provisions for tobacco quota buyouts of \$8 per pound, much higher than either capitalized value or actual sales prices (Womach, 1998).

Proposals to end the tobacco farm program have usually included compensation for quota owners and growers through a buyout of tobacco quotas funded by excise tax revenues or cigarette industry assessments and other compensation to growers who do not own quota. Gardner (1997) estimated that a \$3-per-pound buyout of quota would cost \$4.8 billion, which could be raised by a 2-cent-per-pack cigarette tax over 10 years. Gardner recommended that a buyout be offered on a county-by-county basis to allow for geographic differences in value of quota. The November 1998 settlement prompted negotiations between cigarette manufacturers and tobacco growers for a side agreement whereby manufacturers would make compensatory payments to quota owners and growers in exchange for a reduced price for tobacco leaf.

Tobacco Growers

Tobacco farms vary considerably in size, location, yields, financial condition, and management characteristics. A particular farm’s production costs, potential for expansion, and availability of alternative opportunities are important determinants of its prospects for remaining viable as a tobacco producer. Farms with low production costs due to good soils, good management, and other factors, will be in a good position to survive if prices decline. Large producers can take advantage of size economies to reduce per-unit production costs. Larger acreage and production makes investments in machinery, greenhouses, irrigation, and other equipment and technology feasible, because the large fixed costs of such investments can be spread over a greater volume of output. The labor intensity of tobacco production tends to keep tobacco farms relatively small, and the tobacco program’s restrictions on quota transfers across county lines have prevented the consolidation and increase in tobacco farm size that have occurred in most other types of farming. Farms that have already made investments in equipment will be in position to expand further. Expansion potential will become more important if the tobacco program is eliminated.

In this section, we report characteristics of flue-cured and burley tobacco farms for 1995-96 (the most recent year for which data are available) estimated from the

Table 6—Tobacco quotas by region, 1995-96

Region	Average rental rate ¹	Quota rented ²
	<i>Cents per pound</i>	<i>Percent</i>
Burley, 1995	33	56
Kentucky	45	61
Tennessee	20	54
Flue-cured, 1996	37	65
Piedmont	34	51
Coastal Plain	39	74
Pee Dee-Lumber River	35	75
Georgia	38	D

D = Data insufficient for disclosure.

¹Average is weighted by pounds of tobacco quota rented.

²Percent of quota rented for cash or shares.

Source: ERS analysis of 1995 Farm Costs and Returns Survey for burley tobacco and 1996 Agricultural Resource Management Study for flue-cured tobacco. Coefficients of variation (C.V.'s) of estimates are less than 25 percent unless indicated otherwise. The C.V. is computed by dividing the estimate's standard error by the estimate and multiplying by 100. The lower the C.V., the more reliable is the estimate.

FCRS/ARMS data that reflect the diversity of tobacco farm characteristics across tobacco types. Important regional differences are highlighted, which suggest greater vulnerability in the burley-growing regions of Tennessee and Kentucky and the Piedmont flue-cured region (see Appendix 2, “Tobacco-Growing Regions”). We report on financial conditions of tobacco farms, income, land use, farm size, diversification, and operator characteristics. These data provide indicators of how vulnerable tobacco growers are to changes in the tobacco industry.

Most tobacco farms are in relatively good financial condition. Farms were classified on the basis of whether they generated positive net farm income and whether their ratio of debts to assets exceeded 40 percent in 1995/96. Eighty-one percent of both burley and flue-cured tobacco farms were in “favorable” financial condition (they had positive net farm income and debt-asset ratios under 40 percent) (table 7). By comparison, only 54 percent of all U.S. farms were classified in favorable financial condition in 1995 (Sommer and others). The percentage of tobacco farms in favorable financial position varied across tobacco-growing regions, reaching as low as 67 percent in Georgia and as high as 90 percent in the Piedmont flue-cured region. Debt-asset ratios were also healthy for tobacco farms. FCRS/ARMS data indicate that debt averaged only 13 percent of the value of flue-cured farm assets in 1996, and only 7 percent of burley farm assets in 1995. The average value of assets per farm was over \$500,000 for flue-cured farms and \$250,000 for burley farms.

Net farm income for Tennessee tobacco farms, averaging \$3,800 in 1995, was significantly lower than the national average of \$10,400 for all farms (table 7). Average net farm income for Kentucky burley farms (\$13,100) was slightly above the national average, and average income for flue-cured farms was far above the national average in each region. Table 7 shows that net farm income on flue-cured farms in 1996 averaged \$45,100 in the Piedmont, and was much higher on the larger farms in the Coastal Plain (\$84,600), Pee Dee-Lumber River area (\$99,400), and Georgia (\$61,300).

Glaze and McElroy compared characteristics of high-, mid-, and low-cost burley tobacco farms, using the 1995 FCRS data. One characteristic that stands out in Glaze and McElroy’s analysis is the connection between low cost and higher yields per acre. Higher yields permit fixed costs to be spread over more units of output, reducing the cost per pound. Yields follow

Table 7—Financial performance of tobacco farms, by region, 1995-96

Tobacco type/region	Favorable financial position ¹	Average net farm income
	Percent	Dollars
All U.S. farms, 1995	54	10,400
Burley, 1995	81	9,800
Kentucky	83	13,100
Tennessee	76	3,800*
Flue-cured, 1996	81	72,300
Piedmont	90	45,100
Coastal Plain	79	84,600
Pee Dee-Lumber River	81	99,400
Georgia	67	61,300*

¹Debt-asset ratio 0.4 or less and positive net farm income.

* Coefficient of variation is between 25 and 50 percent.

Note: percentages may not add to 100 due to rounding.

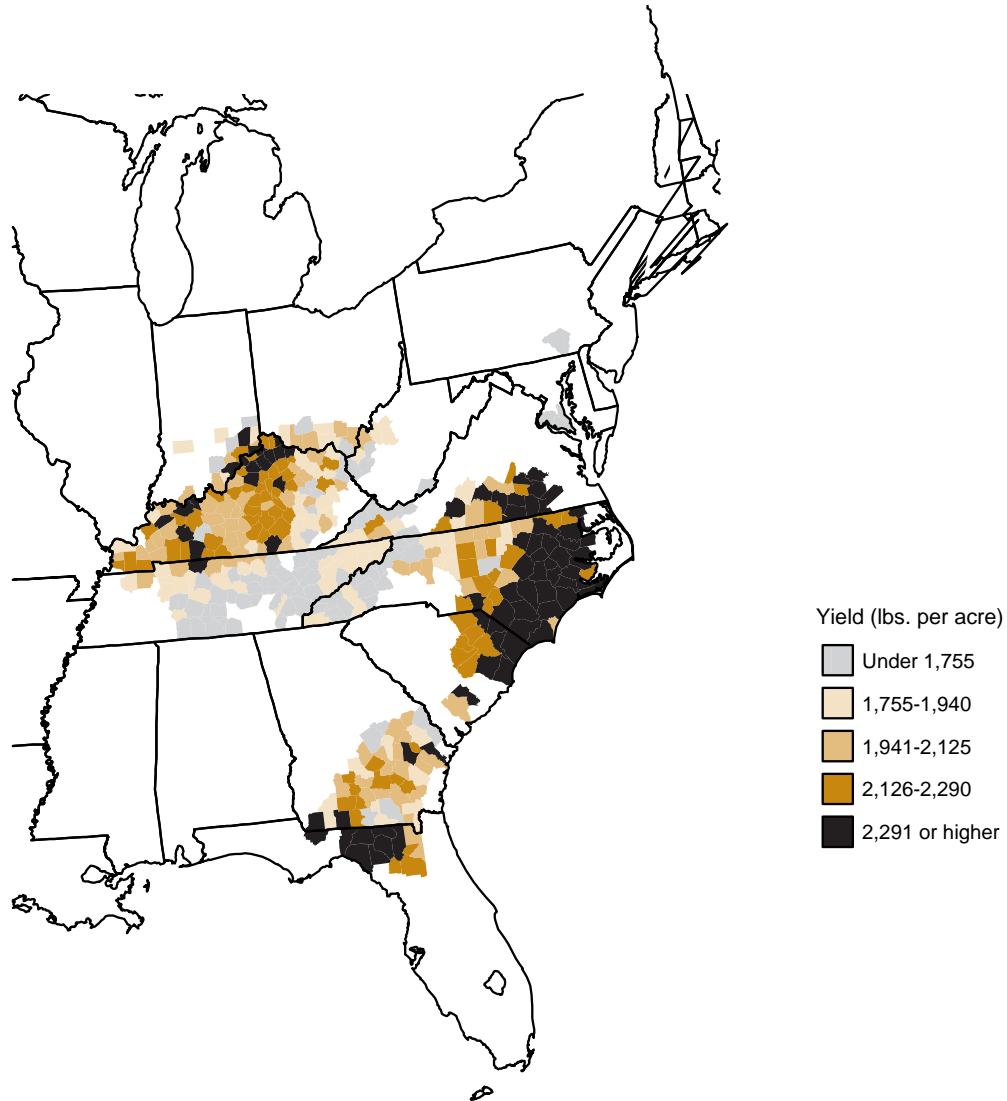
Source: ERS analysis of 1995 Farm Costs and Returns Survey for burley tobacco and 1996 Agricultural Resource Management Study for flue-cured tobacco. Coefficients of variation (C.V.'s) of estimates are less than 25 percent unless indicated otherwise. The C.V. is computed by dividing the estimate's standard error by the estimate and multiplying by 100. The lower the C.V., the more reliable is the estimate.

regional patterns. The highest flue-cured yields are in the Coastal Plain, Pee Dee-Lumber River, northern Florida, and southeastern Virginia (fig. 4). Yields are lower (and presumably costs per unit are higher) in the Piedmont of North Carolina, most of southern Virginia, and Georgia. This is another sign of vulnerability in the Piedmont flue-cured region. Burley yields tend to be highest in central and western Kentucky, and lower in Tennessee and most mountainous Appalachian counties.

Tobacco accounts for a small proportion of acreage, but a large share of income on most farms that grow it. This is due to the labor intensity of tobacco, quota restrictions, and requirements that participants in the tobacco program plant less than half of their cropland in tobacco. The average flue-cured farm devoted 38 of its total 442 acres to tobacco; and the average burley farm harvested tobacco from only 5 of its 154 total acres (table 8). Flue-cured farms are particularly diversified—many have large nontobacco enterprises. Forty-four percent of burley producers produced only tobacco, compared with only 18 percent of flue-cured farms. Forty-two percent of flue-cured farms produced four or more commodities. About half of flue-cured farms grew corn and/or soybeans, 22 percent raised cattle, 17 percent grew cotton, and 12 percent grew peanuts (table 9). The value of production of these commodities was significant, ranging from an average of \$23,500 per farm for corn to \$162,800 per farm for

Figure 4

Tobacco yield, by county, 1997



Source: Compiled by ERS from USDA/NASS county production estimates.

cotton. (Some flue-cured farms raised hogs and poultry or grew fruits and vegetables, but there were not enough farms in the survey sample to produce reliable estimates.) By comparison, relatively few burley farms had crop enterprises. Most burley farms had beef cattle, but cattle sales generated relatively little income, averaging only \$8,400 in production. Six percent of burley farms had a dairy enterprise, which generated an average of \$66,700 in production. Census of Agriculture data indicate that tobacco growers devoted 6 percent of their acreage to tobacco in 1997, but obtained 79 percent of their gross income from tobacco (fig. 5). Census data for 1997 also indicate that about 13 percent of land on tobacco farms was

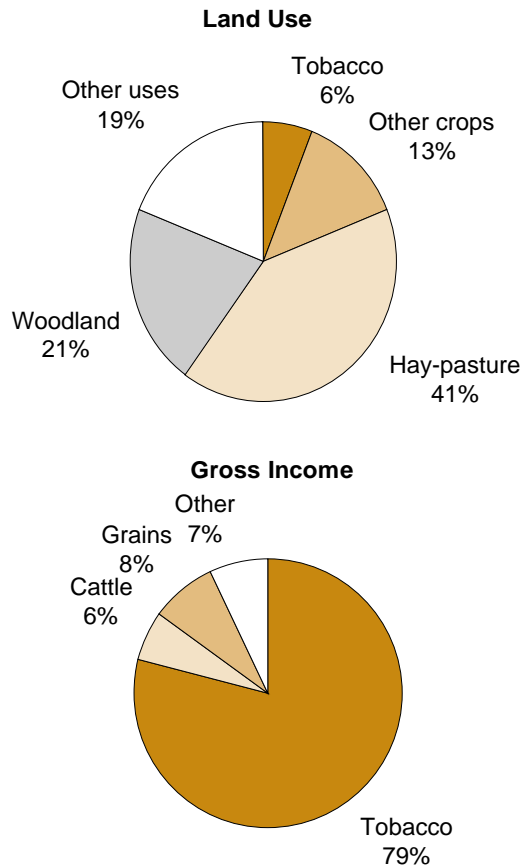
devoted to growing other crops, about 41 percent was in hay or pastureland, 21 percent was in woodland, and 19 percent was idled, enrolled in conservation programs, or in houselots and ponds.¹¹ Nontobacco acres produced relatively little income.

We used FCRS/ARMS cost-of-production data to compare per-acre returns from tobacco with returns from corn, cotton, peanuts, and soybeans in the tobacco-growing region. Table 10 shows two measures

¹¹The definition of a tobacco farm used for the census data is a farm that obtains at least half of its sales from tobacco. USDA ARMS/FCRS data are for all farms that grow tobacco.

Figure 5

Land use and source of gross income by tobacco farms, 1997



Note: Includes only farms obtaining at least 50 percent of sales from tobacco.

Source: Calculated by ERS using data from 1997 Census of Agriculture.

of returns per acre for tobacco and other crops. The first is the difference between gross value of production and cash expenses for variable and fixed costs, a measure of the amount of cash returns typically generated by these enterprises. Table 10 shows that burley and flue-cured tobacco each generated an average of about \$2,000 over cash expenses per acre in 1995-96. Cotton was the nearest competitor to tobacco, but its cash returns averaged only \$267 per acre, followed closely by peanuts at \$261 per acre. Cash returns were \$174 per acre for corn and \$89 for soybeans. The second measure of returns shown in table 10, the residual returns to management and risk, takes into account the

Table 8—Diversification of tobacco farms, 1995-96

	Burley farms, 1995	Flue-cured farms, 1996
	<i>Acres per farm</i>	
Average total acres per farm	154	442
Average tobacco acres per farm	5	38
	<i>Percent of farms</i>	
Number of commodities sold:		
Only tobacco	44	18
Two commodities	31	19
Three commodities	15	21
Four or more commodities	9*	42

Note: columns may not add to 100, due to rounding.

* Coefficient of variation is between 25 and 50 percent.

Source: ERS analysis of 1995 Farm Costs and Returns Survey for burley tobacco and 1996 Agricultural Resource Management Study for flue-cured tobacco. Coefficients of variation (C.V.'s) of estimates are less than 25 percent unless indicated otherwise. The C.V. is computed by dividing the estimate's standard error by the estimate and multiplying by 100. The lower the C.V., the more reliable is the estimate.

Table 9—Importance of other commodities on tobacco farms, by tobacco type, 1995-96

Commodity	Farms with production		Average value of production ¹	
	Burley	Flue-cured	Burley	Flue-cured
	<i>Percent of farms</i>		<i>Thousand dollars</i>	
All commodities combined	100	100	30.4	329.2
Tobacco	100	100	16.7	154.0
Soybeans	4*	52	41.5	23.5
Corn	5	49	37.0	38.7
Cattle	47	22	8.4	4.7
Cotton	L	17	D	162.8
Peanuts	L	12	D	57.7
Dairy	6	D	67.2	D

¹Average value of production for those reporting production of the commodity.

*Estimate's coefficient of variation is between 25 and 50 percent.

L=Less than 1 percent of farms have this commodity.

D=Data insufficient for disclosure.

Source: ERS analysis of 1995 Farm Costs and Returns for burley tobacco and 1996 Agricultural Resource Management Study for flue-cured tobacco. Coefficients of variation (C.V.'s) of estimates are less than 25 percent unless indicated otherwise. The C.V. is computed by dividing the estimate's standard error by the estimate and multiplying by 100. The lower the C.V., the more reliable is the estimate. Data for hogs, poultry, vegetables, fruits, and nuts could not be reported, due to insufficient data for disclosure.

full economic “opportunity costs” of labor, land, and other capital. This measure subtracts imputed wages, rent, and interest that could have been earned by employing factors of production in other activities, and again shows much higher returns for tobacco than for other crops. In 1995-96, residual returns to management were \$661 per acre for flue-cured tobacco and \$407 for burley tobacco. These returns are again much higher than the returns to the other crops shown in the table, which ranged from \$132 per acre for cotton to \$6 for soybeans. These data reflect the significantly higher returns earned by tobacco compared with other crops. Returns from livestock and other land uses are also generally much lower. Indeed, on many tobacco farms, the income from tobacco subsidizes other enterprises that generate no net income. The small proportion of acreage devoted to tobacco and low returns from alternative land uses suggest that prospects for replacing tobacco with income from other crops are poor. Indeed, without the acreage restrictions imposed by the quota system, many operators would try to expand tobacco acreage, since returns from tobacco are so much higher than returns from other crops.

Apart from the effects of the quota system, tobacco acreage expansion is limited by the cost and availability of labor, curing barns, mechanized equipment, irrigation, and management skill to plant, cultivate, and harvest large acreages. The topography and relatively dense settlement of mountainous Appalachian areas and the hilly Piedmont region make mechanization and farm expansion relatively difficult for farms in those

Table 10—Returns for major field crops in the tobacco production zones, 1996

	Gross value of production less cash expenses ¹	Residual returns to management and risk ²
	<i>Dollars per planted acre</i>	
Burley tobacco	2,165	407
Flue-cured tobacco	1,951	661
Corn	174	52
Cotton ³	267	132
Peanuts	261	44
Soybeans	89	6

¹Returns above variable and fixed cash costs.

²Accounts for the full economic costs and returns. The opportunity costs for labor, land, and other capital are included in expenses. The opportunity cost of owned land is derived from a composite of the cash and share rental rates. The opportunity cost of unpaid labor is computed using the agricultural wage rate. For nonland capital, the 6-month Treasury Bill rate is used to measure opportunity costs.

³Excludes Government payments.

Source: Cost-of-production accounts, USDA/ERS.

regions. Expansion of acreage would require investment in new equipment, irrigation, curing, and other facilities. Obtaining credit for such investments could be a barrier for many farmers. Lenders would be less inclined to lend for tobacco investments in the absence of a tobacco program, since prices would decline and income would fluctuate more from year to year. Expansion would also require additional seasonal labor, which would likely be supplied by migrants.

Human resources will also have an important influence on how tobacco growers respond to changes in the industry. The management objectives, age, and education of farmers will be important influences on whether farmers choose to remain in tobacco farming, make new investments to expand their operations, retire, or switch to off-farm employment. Table 11 shows that burley tobacco farmers are less likely than flue-cured farmers to be involved in farming as their principal occupation. Only 43 percent of burley farmers said farming was their principal occupation, compared with 89 percent of flue-cured farmers. In Tennessee, only 26 percent said farming was their principal occupation, compared with 53 percent of Kentucky farmers. About 30 percent of Tennessee tobacco farmers said they were retired in 1995, while only a few tobacco farmers in other regions said they were retired. The percentage who said farming was their principal occupation was over 80 percent in each of the four flue-cured regions. Nationally, less than half of farm operators report farming as their principal occupation (Sommer et al.), so flue-cured tobacco farming households are much more likely to be involved in farming full-time than most other farm households.

Like other U.S. farmers, a large share of tobacco growers are at advanced ages, especially in Tennessee, where the average age of operators was 54. The average age of tobacco farmers was 51 for burley and 52 for flue-cured farms (table 11). While these averages seem high, they are actually lower than the average age for all farm operators of 54.3 reported in the *1997 Census of Agriculture*. The profitability of tobacco has attracted a relatively large number of young farmers. Census data indicate that 10 percent of tobacco farm operators were under age 35 in 1997, compared with 7.8 percent of all farm operators. Younger farmers are more inclined to make new investments to expand their tobacco operations or begin a new enterprise if capital is available to them. Many older operators will continue to grow tobacco on small farms with older, depreciated equipment and buildings, even in the

Table 11—Characteristics of tobacco farm operators

	Farming principal occupation	Average age	High school or higher education	At least some college
	<i>Percent</i>	<i>Years</i>	<i>Percent</i>	<i>Percent</i>
Burley, 1995	43	51	67	11
Kentucky	52	50	74	D
Tennessee	26	54	53	D
Flue-cured, 1996	89	52	77	34
Piedmont	84	53	72	D
Coastal Plain	93	53	75	35
Pee Dee-Lumber River	88	49	82	D
Georgia	86	51	87	D

D=Data insufficient for disclosure.

Source: ERS analysis of 1995 Farm Costs and Returns for burley tobacco and 1996 Agricultural Resource Management Study for flue-cured tobacco. Coefficients of variation (C.V.'s) of estimates are less than 25 percent unless indicated otherwise. The C.V. is computed by dividing the estimate's standard error by the estimate and multiplying by 100. The lower the C.V., the more reliable is the estimate.

absence of the tobacco program, because they have limited alternatives and relatively low cash costs.

Flue-cured operators tended to have higher levels of education than burley operators. More educated farmers may have better access to information, new management techniques, and better alternatives outside of farming. Only two-thirds of burley farm operators had completed high school, less than the 79 percent of all farm operators reported by Sommer and others. The 77 percent of flue-cured farmers with a high school education or higher is comparable to the national average. The share of tobacco farmers with high school degrees varies across regions. Only 53 percent of Tennessee tobacco growers had completed high school, while the share of Kentucky farmers (74 percent) was closer to the national average. Among flue-cured farmers, the percent with a high school degree was lowest in the Piedmont (72 percent) and Coastal Plain (75 percent) regions, and higher in the Pee Dee-Lumber River (82 percent) and Georgia (87 percent) regions. About one-third of flue-cured operators had some education beyond high school, compared with only 11 percent of burley operators.

Regional Impacts of Tobacco Manufacturing

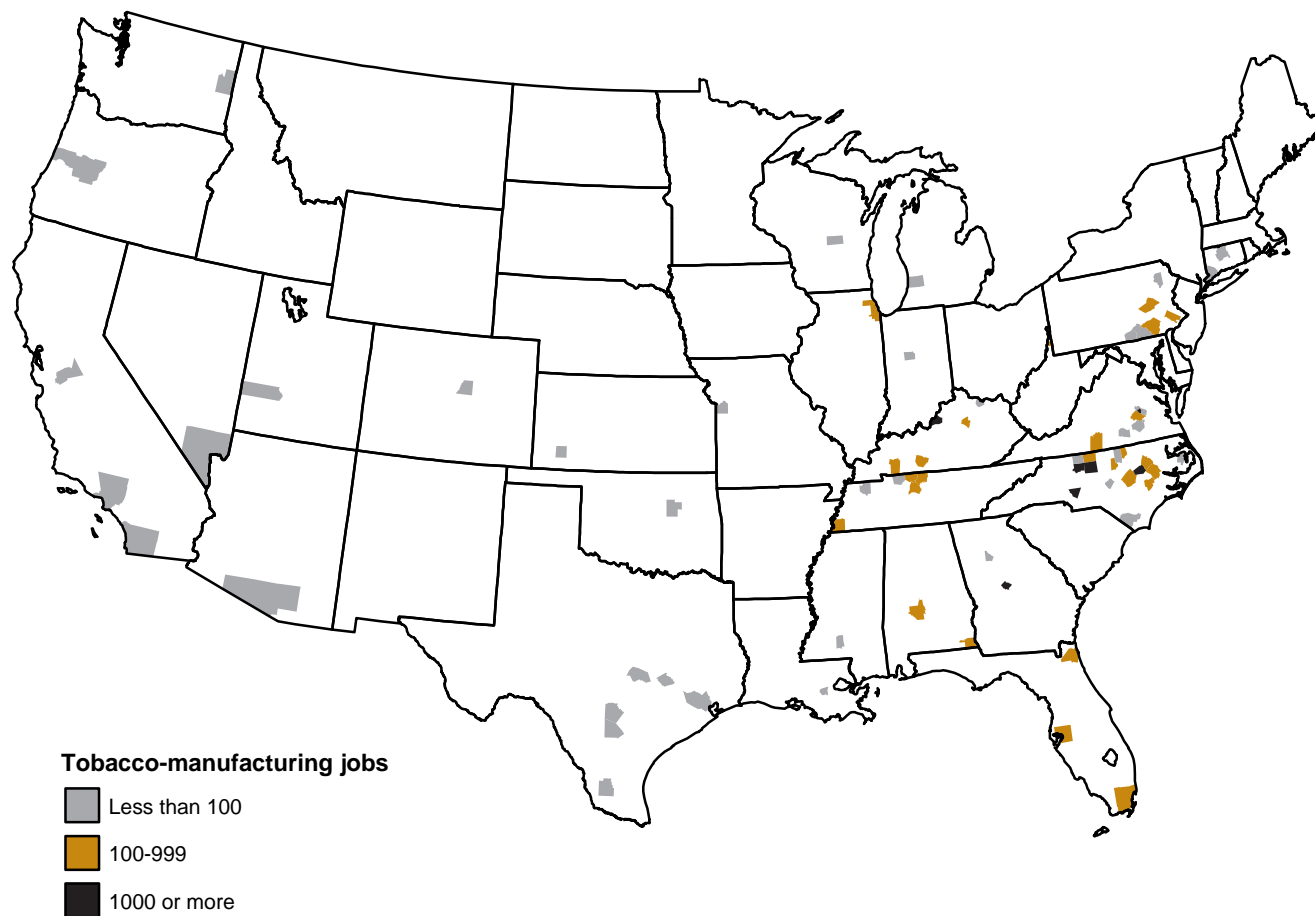
Tobacco manufacturing is a large sector that provides highly paid jobs. This section identifies counties where tobacco manufacturing is important and evaluates their vulnerability to loss of tobacco manufacturing employment. Our analysis of U.S. Bureau of the Census, County Business Patterns data shows that 76 counties nationwide had tobacco-manufacturing establishments in 1996. While manufacturing is concentrated in relatively few southern counties, small establishments can

be found throughout the Nation (fig. 6). Richmond, VA, is the largest manufacturing center, followed by Winston-Salem, NC, and Macon, GA, with each location having more than 5,000 tobacco-manufacturing jobs in 1996. Other large cigarette-manufacturing operations are in Louisville, KY, Concord, NC, and Guilford and Rockingham Counties, NC. Smaller cigarette manufacturers are located in several counties of North Carolina, Virginia, and Kentucky. Additionally, Philip Morris headquarters employs some people in New York City. Twenty counties had at least 10 workers employed in tobacco stemming and redrying in 1996, led by Wilson, NC, with more than 1,000 workers. Chesterfield and Pittsylvania Counties in Virginia and Vance County, North Carolina, are other centers of stemming and redrying employment. Six counties employ between 100 and 1,000 workers in cigar manufacturing: three in Florida, two in Alabama, and one in Pennsylvania. Nine counties in Kentucky, Illinois, Tennessee, North Carolina, West Virginia, and Tennessee employ between 100 and 1,000 employees in the manufacture of chewing and smoking tobacco.

Tobacco manufacturing is a major part of the local economy in the biggest cigarette-manufacturing centers and in a handful of other counties that have important tobacco leaf markets. Cigarette manufacturing accounts for between 5 and 10 percent of all personal income in five counties, including Forsyth, Cabarrus, and Rockingham Counties, NC; Richmond County, VA; and Bibb County, GA. Seven counties derive between 1 and 3 percent of personal income from tobacco manufacturing. Tobacco manufacturing's share of local personal income is less than 1 percent in all other counties. These data suggest that a handful of local economies (those with cigarette-manufacturing

Figure 6

Counties with tobacco-manufacturing employment, 1996



Source: Compiled by ERS using data from U.S. Bureau of the Census, 1996 County Business Patterns.

operations and leaf markets that have large stemming and redrying operations) would be significantly affected by a decline in tobacco manufacturing.

Bureau of Labor Statistics data show that cigarette-manufacturing employment has declined steadily in recent years. After peaking at about 46,000 in 1983, cigarette-manufacturing employment fell to less than 26,000 in early 1999 (fig. 7). Jobs in other types of tobacco manufacturing (tobacco stemming and redrying, cigars, chewing and smoking tobacco) fell steeply from the 1950's until 1990, as worker productivity rose and demand for cigars and smoking tobacco fell. Resurgent growth in demand for cigars in the 1990's may have helped stabilize noncigarette tobacco-manufacturing employment in recent years. Following the 1998 tobacco settlement, manufacturers and other processors appear to be downsizing in anticipation of falling demand for their product. In 1998, Philip

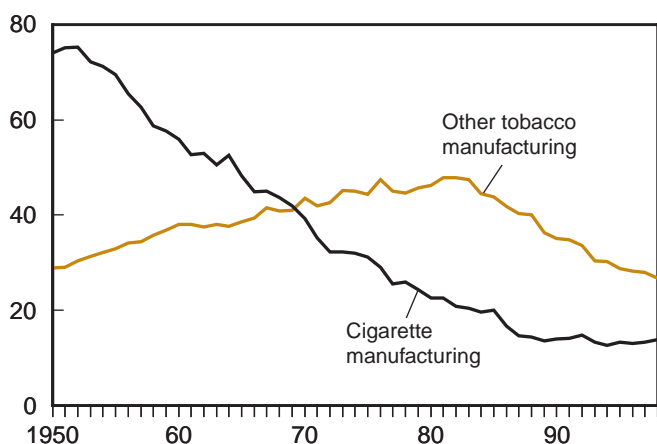
Morris announced plans to shrink its U.S. work force by 16 percent. This included plans to close its Louisville, KY, plant, eliminating 130 jobs, and large cuts at its Richmond, VA, facility. Some of the job cuts are to be accomplished through early retirement incentives, and some employees will be transferred to the company's newer, efficient operation in Concord, NC, but significant layoffs are also expected. Dimon, Inc., the second-largest leaf dealer, also announced plans in 1999 to close a Kinston, NC, processing plant to consolidate work at its Danville, VA, plant. This was expected to cut 100 full-time jobs and 600 seasonal jobs in Kinston, and possibly add some jobs to the 130 full-time and 600 seasonal jobs in the Danville plant.

If tobacco demand continues to fall, additional job cuts and plant closures will likely occur. Across-the-board job losses at each plant are unlikely. Some locations may actually gain employment as total tobacco-manu-

Figure 7

Tobacco-manufacturing employment, 1950-98

Employees (1,000)



Source: Compiled by ERS from Bureau of Labor Statistics data.

facturing jobs fall, since companies generally consolidate manufacturing activities in the most efficient plants while closing the least efficient plants. For those areas where large numbers of high-paying tobacco jobs could be lost, there is concern about how the local economy might be affected. The number of jobs and income directly provided by tobacco manufacturing might underestimate the importance of the industry to the local economic base, or “primary sector.” Tobacco manufacturers provide business for local companies that supply materials, machinery, inputs, and business services (secondary sectors). The spending of income earned by tobacco employees also supports local retail, service, and real estate business (tertiary sectors). This is the “multiplier effect,” whereby primary sectors (such as tobacco) bring in dollars from outside the region, which supports spending, income, and jobs in secondary and tertiary sectors. Projections of local economic impact of losing or gaining an industry often use multipliers obtained from input-output models of the local economy to predict that a decline in income earned in a primary sector will lead to an even larger impact on total income. However, Johnson (pp. 68-69) points out that the size of actual effects is usually not as large as portrayed by multiplier studies. Elimination of \$100 million in tobacco-manufacturing personal income would not necessarily lead to a loss of more than \$100 million in total income and thousands of jobs for a county.

We compared the estimated and actual impacts of the 1980’s closure of a Petersburg, VA, cigarette plant for a case study of the effects of lost tobacco income.

Prior to the closure of the city’s large Brown & Williamson Co. manufacturing plant, cigarette manufacturing accounted for about 18 percent of personal income and 14 percent of employment in the Petersburg economy. As the plant was gradually shut down in the mid-1980’s, the Petersburg area lost several thousand of its highest paid jobs. The local economy of Petersburg had experienced decline in other manufacturing industries during the 1970’s, so there was little local economic growth to replace the lost tobacco jobs. The highly tobacco-dependent Petersburg economy’s experience should be instructive for other towns concerned about the future impacts of lost tobacco jobs on their economies.

Analysts often use input-output models to predict impacts on employment and income of events such as plant closures. We used IMPLAN (a commonly used regional input-output modeling system) to predict the impact of eliminating tobacco manufacturing from Petersburg’s economy during the mid-1980’s.¹² We compared the IMPLAN predictions with the actual performance of the Petersburg economy over the period of the closure to assess the accuracy of the predictions. According to the IMPLAN analysis, the cigarette plant’s closure should have reduced total personal income in Petersburg by 22 percent, and employment should have fallen by 23 percent (table 12). This includes not only the direct loss of income and employment from the cigarette-manufacturing plant, but also indirect losses in supporting industries, and induced effects as lower incomes lead to lower consumer spending. The multiplier is surprisingly small. According to the IMPLAN analysis, each dollar of income lost directly from the cigarette plant would have led to an additional loss of 17 cents in income elsewhere in the Petersburg economy. The model predicts that for every 100 jobs lost in the plant, another 54 jobs elsewhere in the economy would have been lost. Most of the additional job and income losses would have been in retail trade and services, supported by spending by the plant’s employees.

We compared the IMPLAN estimates with the actual performance of the Petersburg economy over the period of the plant closure. While the loss of tobacco income had an important negative impact on the economy, its multiplier effect appeared to be less than that predicted by input-output analysis. Over the period 1982-86, total

¹²The 1982 IMPLAN data and the 1982 structural matrices were used, since these data correspond to the timing of the actual event.

Table 12—Predicted and actual impacts on local income due to loss of tobacco manufacturing, Petersburg, VA, 1982-86

Sector	Predicted by IMPLAN	Actual, 1982-86
	<i>Percent</i>	
Employment	-23	-0.4
Local personal income	-22	-5
By sector:		
Construction	-9	119
Nontobacco manufacturing	-4	6
Transportation, communications, public utilities	-13	-11
Wholesale and retail trade	-2	23
Finance, insurance, and real estate	-21	9
Services	-11	20
Government	-3	7

Note: values are adjusted for inflation.

Source: Analysis of 1982 IMPLAN model, and unpublished Bureau of Economic Analysis data.

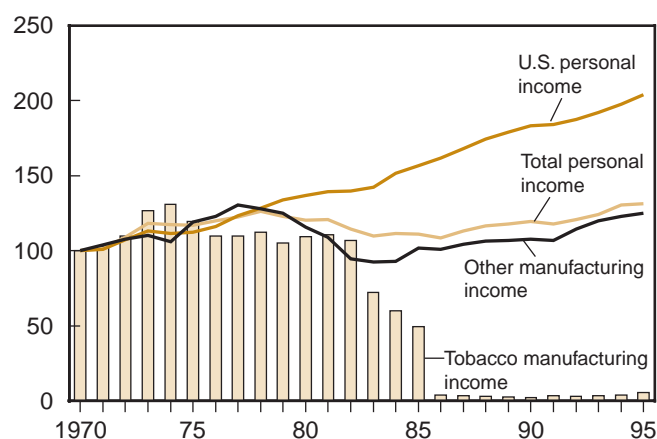
inflation-adjusted personal income fell by 5.4 percent, much less than the 22-percent decline predicted by the IMPLAN estimates. Employment declined by less than 1 percent, again much less than the predicted 23-percent decline. Loss of highly paid tobacco jobs apparently did not devastate the local retail industry as might have been expected. Retail income grew steadily over the 1982-86 period as it recovered from losses experienced during the preceding 5-year period. The only major sectors that lost income were transportation, communications, and public utilities.

The impact of losing tobacco jobs seems to have been much less severe than an earlier decline in other Petersburg manufacturing industries during the 1970's. Nontobacco manufacturing in the city fell sharply during the late 1970's and early 1980's, accompanied by a decline in total personal income during that period (fig. 8). (Real income from tobacco manufacturing in Petersburg was fairly constant during these years.) A recovery of total income coincided with renewed growth of nontobacco manufacturing in Petersburg during the 1980's, despite the loss of tobacco dollars. This suggests that nontobacco manufacturing sectors have stronger local linkages than the cigarette-manufacturing sector. This is supported by inspection of the IMPLAN data, which indicate that only a small share of income earned by cigarette manufacturing stayed in the local Petersburg economy, and that relatively few materials and inputs were bought locally. From this case study, we can conclude that loss of tobacco manufacturing will probably affect local economies less than expected. The performance of the Petersburg

Figure 8

Total personal income and personal income from tobacco manufacturing and other manufacturing, Petersburg, VA, 1970-95

Percent of 1970 level



Source: ERS analysis of data from Bureau of Economic Analysis.

economy indicates a surprising degree of resilience with regard to the ability of local economies to shift resources from one sector to another, even in the short run, in an economy where tobacco manufacturing is a large part of the economic base. In the 1990's, cities with tobacco-manufacturing activity had more vibrant economies than did Petersburg in the 1980's. While there will be difficult individual adjustments for businesses and workers who earn income from tobacco and for governments that derive tax revenue from tobacco-manufacturing plants, major impacts on local economies resulting from a decline in tobacco sales seem unlikely.

Tobacco Farming Communities

Many tobacco-farming communities are concerned about how they will be affected by loss of tobacco farm income. Many communities are well positioned to absorb tobacco income loss, but others are more vulnerable (Gale, 1998). In this section, we discuss the impacts of tobacco decline and identify the most vulnerable tobacco counties. Tobacco-farming communities that offer few alternatives to tobacco production will be the most vulnerable to a decline in tobacco income. As tobacco production falls, regional income will decline as receipts from tobacco decline. Payments to warehouses, local hired labor, repair shops, interest paid to local banks, and rental payments to owners of land and quota will also decline. Spending at retail stores and service businesses will

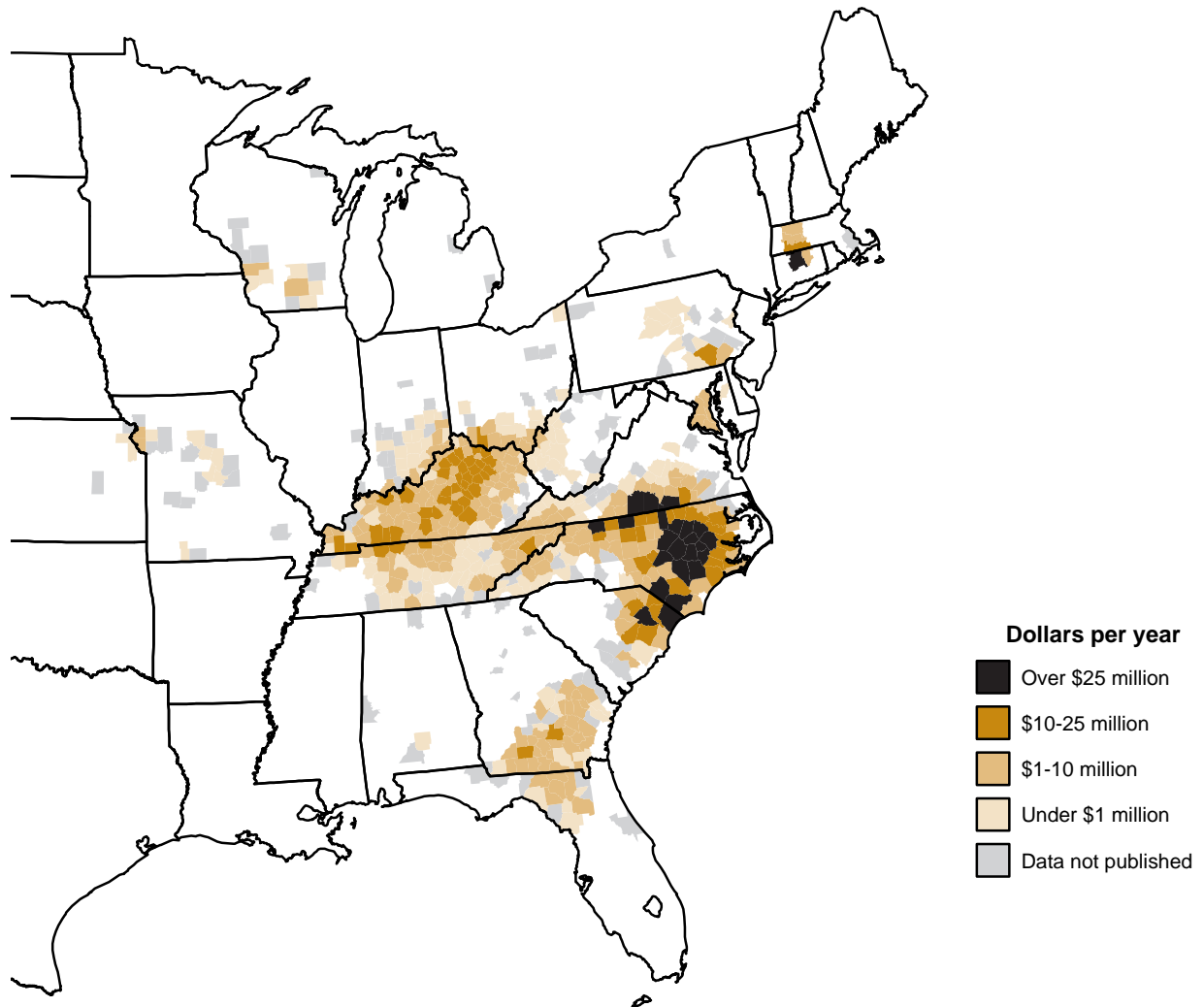
fall as income of growers and quota owners falls. Farm and other real estate values could fall in communities where tobacco is an important source of income. However, as with the national economy, declining spending on tobacco inputs could be partly offset by increased purchases of inputs to expand other farm enterprises. Similarly, injections of income, such as payments to growers or economic development spending resulting from tobacco settlement funds, could cushion the effect on local retail businesses and real estate. If economic development assistance spurs infrastructure improvements, construction jobs could also be created. Further, if the tobacco program were eliminated, regional shifts in production could mean little actual change in the amount of tobacco dollars flowing to the Coastal Plain, Pee Dee-Lumber River, and

Georgia flue-cured regions, where production could expand by up to 40 percent. Thus, the local economic impact on tobacco-growing communities may be less severe than many expect. Another mitigating factor is that a significant portion of tobacco income “leaks” out of the local economy through spending on physical inputs (fertilizer, chemicals, fuel, vehicles, machinery, and other items) manufactured outside the tobacco-growing region and payments to landowners, quota-owners, and migrant workers who live outside the county. The loss of that income will not affect the economy of the tobacco-growing community.

In contrast to income from tobacco manufacturing, which is concentrated in a handful of cities, income from tobacco farming is more broadly distributed across 568 counties, mostly in the Southeast. Tobacco

Figure 9

Value of tobacco production, by county, 1997

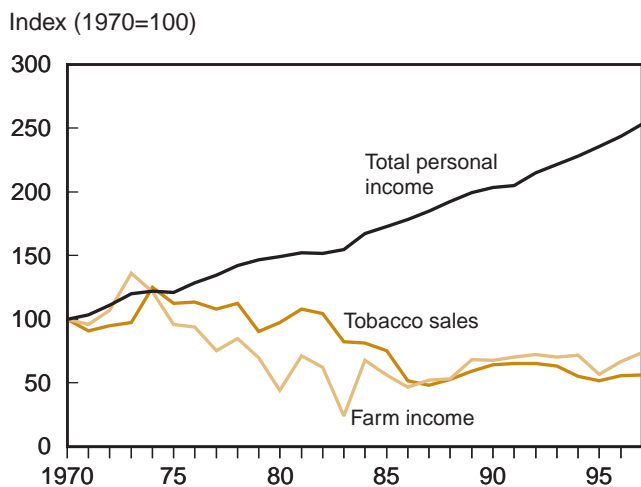


Note: Data were not published for 120 counties to prevent disclosure of individual operations.
 Source: Compiled by ERS from U.S. Bureau of the Census, 1997 Census of Agriculture data.

is grown in most counties of Kentucky, North Carolina, and Tennessee (fig. 9). Other major growing areas, where tobacco is considered to be an important part of both the economic and social fabric of the community, include southern Virginia; the Coastal Plain of South Carolina, Georgia, and Florida; and the southern parts of Indiana, Ohio, and Maryland. The largest flows of tobacco income are in the Coastal Plain of North Carolina. Most of the top 20 counties in 1997 tobacco sales, according to the *Census of Agriculture*, were in this region. Farm sales of tobacco in these counties generally run between \$20 million and \$50 million per year, and several of the counties also obtain significant income from stemming and redrying. Tobacco sales are between \$1 million and \$9 million in most other tobacco-growing counties.

Tobacco has an important historical role in the agrarian past of many southern communities, but its importance declined as other sectors of the economy grew. To illustrate this, we compared growth in tobacco income, as reported by USDA, with growth in total personal income and farm income reported by the U.S. Dept. of Commerce's Bureau of Economic Analysis (fig. 10). Since 1970, total personal income (in constant dollars) earned in the Nation's tobacco-growing counties has risen fairly steadily, with a cumulative increase of nearly 150 percent. Over that same period, tobacco sales have remained fairly constant in nominal dollars (\$2-3 billion), and have declined in constant dollars. Using gross tobacco sales as a proxy for the amount of income brought into the region by tobacco,

Figure 10
Income trend in tobacco-growing counties, 1970-97



Source: Bureau of Economic Analysis data, adjusted for inflation.

we find that the ratio of tobacco sales to total personal income fell from 3 percent in 1970 to 0.7 percent in 1997. There are no data on personal income derived from tobacco farming at the county level, but personal income from all types of farming is available. Farm income (in constant dollars) in tobacco-growing counties fell along with tobacco sales, and the share of all personal income derived from farming in those counties fell from 5 percent in 1970 to 1 percent in 1997 (Gale, 1999).

Most tobacco is produced in or near growing metropolitan areas, whose proximity translates to greater opportunities for nonfarm jobs, rising land values, and a customer base for fruits, vegetables, pick-your-own, or other on-farm businesses, such as paid fishing or hunting. We classified tobacco-growing counties on the basis of their degree of urbanization using a set of Urban Influence Codes developed by ERS (Ghelfi and Parker, 1997). There are 125 tobacco counties located in small metro areas (populations under 1 million), and 185 tobacco counties are adjacent to small metro areas. Counties in or adjacent to small metro areas account for 73 percent of estimated tobacco receipts. These small metro areas are attached to cities such as Richmond and Petersburg, VA; Raleigh, Durham, and Winston-Salem, NC; Lexington and Louisville, KY; and Knoxville, TN. A number of smaller cities, such as Danville, VA; Rocky Mount, Greenville, and Goldsboro, NC; Florence, SC; and Hopkinsville, KY, lie in the heart of tobacco-growing areas. Thirty-five tobacco counties accounting for 5.7 percent of tobacco receipts lie in or adjacent to large metropolitan areas, including Cincinnati, Washington, DC, and Kansas City. A large number of tobacco counties (193) are not adjacent to any metro area, but they account for only about one-fifth of tobacco receipts.

Policymakers are interested in identifying the areas most vulnerable to the loss of tobacco farm income. This report presents two updated measures previously reported by Gale (1994; 1997; 1999), which assess the importance of tobacco farm income to total income in county economies. The first measure is the ratio of tobacco gross income to local personal income:

$$\text{RATIO} = \text{TOBINC} / \text{TLPI}$$

In this report, TOBINC is the county-level value of tobacco production reported in the 1997 *Census of Agriculture*, and TLPI is total labor and proprietors' income by place of work per county for 1997, reported

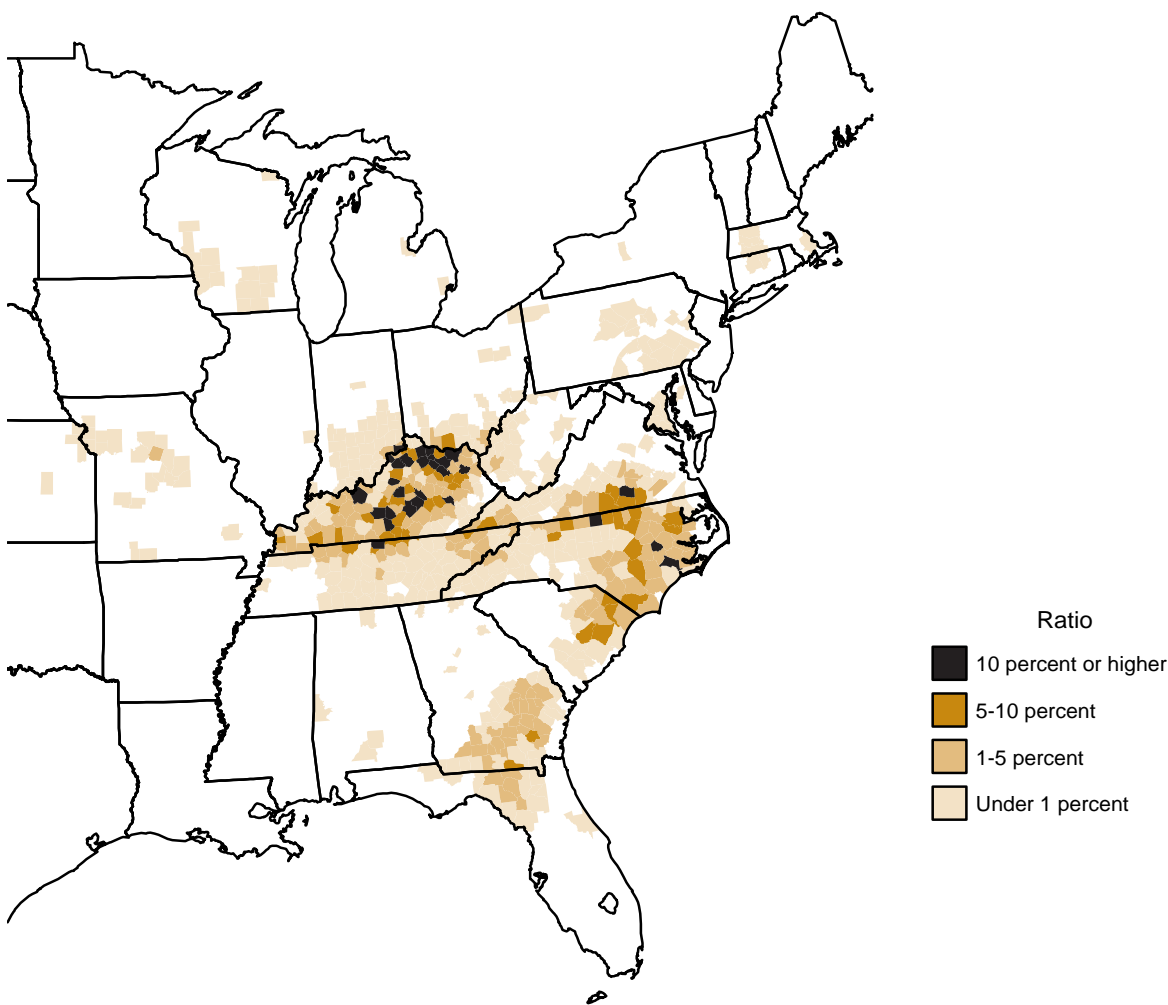
by the U.S. Dept. Commerce, Bureau of Economic Analysis. TLPI measures income earned within a county. It excludes income earned by county residents who commute to jobs in other counties. TLPI also excludes income from dividends, interest, rent, and transfer payments. Gross tobacco income is used to compute this ratio since there are no geographic data on net income earned from tobacco. Gross tobacco income overstates the amount of income earned by tobacco growers, but it is a reasonable measure of the total amount of economic activity related to tobacco in a county. While growers keep only a fraction of gross earnings from tobacco, many of their expenses are paid to local landlords, quota owners, laborers, and local businesses, such as farm supply and equipment

dealers, warehouses, and financial institutions. Note that this measure does not include income from tobacco processing or manufacturing activity, which was covered in an earlier section.

Of 568 counties with tobacco production in 1997, 28 had tobacco-personal income ratios exceeding 10 percent, and 52 counties had ratios of 5 to 10 percent.¹³ Another 135 counties had ratios between 1 and 5 percent, and 353 had ratios under 1 percent (fig. 11).

¹³Data on 1997 tobacco production for 120 counties were suppressed by the *Census of Agriculture* to prevent disclosure of individual farm operations. These counties are not shown in fig. 11, but we estimate that the ratio of tobacco sales to personal income would be less than 1 percent in nearly all of them.

Figure 11
Ratio of tobacco receipts to total local earnings, 1997



Note: Total local earnings refers to total labor and proprietors' income. Shows counties for which market value of tobacco production was reported in the 1997 *Census of Agriculture*.
 Source: Calculated by ERS using data from U.S. Bureau of the Census, 1997 *Census of Agriculture* and Bureau of Economic Analysis, Regional Economic Information System.

This suggests that there are few counties where tobacco farming accounts for a large share of the local economy.¹⁴ Farming, in general, is a relatively small part of local economies in most tobacco-growing areas. Based on the ERS definition of “farm dependency” (counties where farm earnings are 20 percent or more of total earnings), only 28 tobacco-growing counties are farm-dependent.

The counties with the highest tobacco income are not necessarily the most dependent on tobacco. Only a few of the leading tobacco counties in eastern North Carolina and southern Virginia are among the counties with the highest tobacco-personal income ratios. Of the 28 counties with ratios over 10 percent, 22 are in Kentucky, and all but three had tobacco sales of less than \$20 million in 1997. North Carolina had three counties with tobacco-personal income ratios over 10 percent, while Virginia, Tennessee, and Indiana each had one. The most dependent counties accounted for 17 percent of tobacco farms and 12 percent of tobacco production in 1997.

¹⁴The personal income measure (total local personal income) used in the denominator of this ratio includes only income earned within the county. Using total personal income, which includes income earned outside the county (by commuters), transfer payments, dividends, interest, and rent, yields even lower ratios. See Gale (1999) for more discussion of this measure.

Table 13 shows basic economic data for counties in the same four tobacco income ratio classes shown in fig. 11. In 1997, farming provided nearly one-fourth of jobs in the most dependent tobacco counties, much higher than the share in other tobacco counties, indicating a lack of nonfarm alternatives in counties highly dependent on tobacco. Per capita income was also much lower in the most dependent counties, averaging \$15,900, compared with \$23,900 in the least dependent tobacco counties.

Real local earnings and employment also grew more slowly in the most dependent counties than in other tobacco counties, a further sign that adjustments to loss of tobacco income will be particularly difficult in those regions. Counties with a tobacco-personal income ratio of 10 percent had average total employment growth of 7.5 percent between 1991 and 1997, much lower than the 14- to 15-percent average employment gains in counties that were less dependent on tobacco. Personal income growth also lagged behind in the most dependent tobacco counties. Not only do the most dependent tobacco counties have the poorest alternatives to tobacco, but many of them are also among the most likely to lose tobacco farms and income. A number of highly dependent counties are in the Piedmont flue-cured and eastern Kentucky regions, where production costs tend to be higher, yields lower, and farms smaller and with less potential for expanding production. These counties appear to be the most vulnerable to declining tobacco sales.

Table 13—Economic characteristics of counties by degree of tobacco reliance

		Tobacco-personal income ratio ¹				
		All tobacco counties ²	10 percent or higher	5-10 percent	1-5 percent	1 percent or less
Counties	Number	568	28	52	135	233
Share of tobacco farms, 1997	Percent	100	17	21	40	22
Share of tobacco production, 1997	Percent	100	12	25	45	18
Farm share of local personal income, 1997	Percent	3	25	11	6	2
Per capita personal income, 1997	\$1,000	23.0	15.9	18.1	18.5	23.9
Total employment growth, 1991-97	Percent	14.3	7.5	14.0	15.6	14.1
Real personal income growth, 1991-97	Percent	3.5	2.4	4.0	3.7	3.3

¹Ratio of total value of tobacco production to total personal income per county, 1997.

²Categories do not always add to totals because tobacco-personal income ratios could not be computed for 120 counties for which tobacco production was not published in the *1997 Census of Agriculture*.

Source: Calculated by ERS using data from *1997 Census of Agriculture* and Bureau of Economic Analysis, Regional Economic Information System.

Transitional Assistance

While the impacts of a declining tobacco industry on the economy as a whole are modest, many individuals, businesses, and communities will face difficult adjustments in the short run. Assistance to affected individuals, businesses, farms, and communities is justified on two counts: (1) compensation for capital losses (of economic rents), and (2) transitional assistance to help individuals and communities make the switch to non-tobacco employment. A buyout of tobacco quotas is an example of compensation for capital losses. Financial assistance for retraining, farm diversification, or economic development programs are examples of transitional assistance.

Legislative proposals for comprehensive tobacco legislation offered in 1998 proposed giving economic development grants to States for agricultural and economic development in tobacco-producing counties. Among the proposals were education grants for tobacco farmers and their dependents, a \$500 million worker retraining program for workers employed in manufacturing, wholesaling, or warehousing tobacco; block grants to States for development of agricultural alternatives; on-farm diversification; risk management; and off-farm economic development in tobacco-growing areas. While none of these bills was passed by Congress, several tobacco States are considering spending portions of their tobacco settlement funds on

transitional assistance and economic development. North Carolina will set aside 50 percent of funds received from the Phase I tobacco settlement to fund a nonprofit foundation that will assist tobacco communities. An additional 25 percent of settlement funds will go to a trust fund for tobacco growers, allotment holders, and workers in tobacco-related businesses. Virginia also set aside 50 percent of its settlement proceeds for tobacco growers and communities and established a commission to oversee spending of the funds. Other tobacco States may also set aside a large portion of settlement funds for growers, quota owners, and tobacco communities. In addition to Phase I spending, a Phase II settlement provides \$5.15 billion for growers and allotment holders to compensate them for declining tobacco purchases resulting from the Phase I settlement. With so much money available, States are carefully considering how to spend it effectively to help growers and communities.

Discussion of transitional assistance can be aided by listing the various groups and their likely responses to a decline in the tobacco industry. We will briefly discuss the types of assistance relevant to each category. Different levels of Government, private foundations, financial institutions, or private business are already providing some assistance. The groups in need of assistance can be broadly categorized as in table 14 using a scheme originally developed by Reaves and Purcell.

Table 14—Adjustment strategies and assistance needs for tobacco farms, workers, and communities

Group	Strategy	Needs
Farmers, manufacturing and other workers	Stay in tobacco; expand operation, raise productivity; bear increased risk (if tobacco program is eliminated)	Financing for land and capital acquisition; research on alternative uses; risk-reducing mechanisms; market and price information; market power
	Identify and market alternative crop or commodity	Technical and marketing information; financing
	Seek alternative off-farm employment	Rural job creation; training and skill development; job information and search skills
	Retire	Financial planning
Tobacco communities	Encourage new agricultural enterprises (attract processor; open farmers market; encourage agricultural tourism; promote local purchases by retailers and restaurants)	Assistance in market evaluation; grants/loans for farmers market facility, advertising, and promotion
	Develop or attract nonfarm industry	Grants or loans for infrastructure development and business start-up; aid for local schools and colleges

Source: ERS modification of framework developed by Reaves and Purcell.

Helping Farmers Who Stay in Tobacco

Many farmers will choose to continue growing tobacco as their primary activity. Age, size, and efficiency of the operation, financial status, availability of alternatives, and preferences will influence the decision. Specifically, if the tobacco program were eliminated, low-cost producers with capacity for expansion in the Coastal Plain, Pee Dee-Lumber River region, Georgia, Florida, and central and western Kentucky would be most likely to stay in the industry. In the short run (5-10 years), many less efficient farms with low debt and poor alternatives to tobacco may also continue growing tobacco until their assets are worn out. Farmers who remain in tobacco farming could be assisted in several ways. Research that develops better production technologies could improve farm efficiency. Additional research on alternative uses for tobacco plants as a protein source or for pharmaceutical use could boost demand for the crop if viable products emerge. Those who expand their tobacco acreage will need access to new capital for acquisition of land, facilities, and technology. In the absence of a tobacco program, farmers will face greater fluctuations and uncertainty in prices and returns, and many observers are concerned that greater market power of the relatively few purchasers of tobacco leaf would place farmers at a disadvantage. Many in the industry anticipate that farmers would begin producing on contract for manufacturers (as is done in some foreign leaf markets) if the tobacco program were eliminated. Farmers may need means of reducing revenue risk, such as revenue insurance, forward contracts, or hedging. Growers will also need information about prices and market conditions. Oversight of market relations between growers and buyers and assistance in evaluation of grower contracts may be warranted.

Nontobacco Agriculture

Growing alternative or supplemental crops is another strategy where tobacco farmers may need assistance. This strategy is often referred to as “diversification,” or “supplementation.” Most tobacco farms are already diversified, particularly flue-cured farms. Earlier in this report, we noted that 44 percent of burley farms reported selling only tobacco, while 31 percent had sales from two commodities, 15 percent sold three, and 21 percent sold four or more (table 8). Flue-cured farms were more diversified. Only 18 percent of flue-cured farms sold only tobacco, while 42 percent reported sales from 4 or more different enterprises in 1996.

In a 1995 survey of 529 tobacco farmers by Altman et al., half indicated that they were interested in trying other on-farm ventures to supplement tobacco income, and 58 percent said they had tried to learn about on-farm alternatives to tobacco. Land-grant universities, extension, State departments of agriculture, and non-profit foundations have been assisting farmers in identifying and adopting viable alternatives that can provide high (and stable) returns per acre. Other field crops generally do not satisfy this requirement, but cotton has been a popular alternative in the Coastal Plain area. North Carolina has successfully diversified its agriculture by expanding its hog and poultry industries. The poultry industry is expanding in Kentucky as well. In looking for tobacco alternatives, much attention has been given to other high-value per acre, labor-intensive enterprises, such as vegetables, specialty crops, and direct-marketing strategies. Our analysis of FCRS/ARMS data found that very few tobacco farms had vegetable, fruit, or horticultural enterprises in 1995-96. There were not enough sample farms with these enterprises to provide statistically reliable results (see table 9).

Development of a local market for alternative enterprises is a key to success. When Altman et al. asked farmers about barriers to supplementing tobacco income, the leading response (along with “nothing is as profitable as tobacco”) was “few processing plants connecting farmers to consumers.” Similarly, 60 percent cited “no places to sell new products.” The volume of produce grown in a tobacco area is frequently too small to interest wholesalers or grocers. A coordinated effort may be needed to bring in a processing plant or develop other markets in conjunction with an alternative crop. There have been a number of unsuccessful efforts to develop farmers markets, cooperatives, and relationships with local grocery chains, so efforts should proceed cautiously. Some observers have credited North Carolina’s active agricultural marketing program for the State’s recent development of a highly diversified agricultural sector.

Tobacco diversification initiatives may need assistance in carefully evaluating the economic impacts on local commodity markets. When tobacco farmers switch to alternatives, the increased supply of the alternative commodity can push down local prices, resulting in lower returns than expected and harming local farmers who already grow the commodity. For example, vegetable growers have opposed proposals to assist tobacco farmers in switching to vegetables, because

this would push down prices and the assistance would give an unfair advantage to the former tobacco growers. The small market for specialty and niche crops, such as ginseng, ostriches, and Asian vegetables, can become quickly saturated, driving down prices and returns.

Another barrier to tobacco supplementation or diversification frequently identified by farmers is “lack of capital available for new businesses,” cited by 60 percent in the Altman et al. study. This is relevant for farmers seeking to start a new on-farm enterprise, as well as those seeking to start a nonfarm business. Studies of rural capital markets have found that capital is generally available, but bankers tend to be cautious about lending money for new, unfamiliar enterprises. Lenders look for a well-thought-out business plan that includes careful assessment of prospects for processing and marketing alternative products before they will grant credit. That means that the lack of outlets for alternative products can reinforce the lack of capital access. It should also be pointed out that new, risky ventures are generally financed with equity capital, rather than debt. While borrowed funds may be accessible in rural areas, venture capital for small on-farm diversification projects may be difficult to access.

Economic Development Strategies

Communities can take a number of approaches to developing nontobacco agriculture. Most strategies target high-value-per-acre activities that include on-farm processing or provision of services (pick-your-own, agricultural tourism, on-farm recreation), or marketing strategies that yield a high margin to the grower (farmers markets, roadside stands, direct sales to retailers or restaurants, community-supported agricultural cooperatives).¹⁵ Local governments or organizations can aid in market development by working to attract a processing plant to the community, acquiring grants or loans for construction of a farmers market facility, or coordinating and/or sponsoring advertising or promotion in nearby urban areas. Local organizations may also aid the local dissemination of market and technical information developed by Federal agencies or land-grant universities.

Cities where tobacco manufacturing is important have successfully developed other industries, most prominently, banking and medical services and research, that

¹⁵Gale (February 1997) provides more details about direct farm-marketing strategies.

have reduced their dependence on tobacco. Textile, apparel, and other low-wage, low-skill manufacturing have historically been important in many of the smaller communities where tobacco is grown, but those industries are declining. The region has long relied on attracting manufacturing facilities as an approach to economic development. Many experts in economic development criticize this approach as too costly in State and local tax concessions and infrastructure, and argue instead that encouraging start-up of small, locally owned businesses leads to more sustainable development and places less fiscal pressure on local and State governments. Many communities have built industrial parks to attract business, while others have relied on small business incubators. Nonagricultural development may require investment in infrastructure (telecommunications, highways, water, and sewer) and in local educational institutions, as well as aid to new businesses. Assistance in the form of guaranteed and direct loans, grants, and technical assistance is available through the U.S. Department of Agriculture’s Rural Business-Cooperative Service and Rural Utilities Service, the U.S. Department of Housing and Urban Development’s Community Development Block Grants, the U.S. Department of Commerce’s Economic Development Administration, the Small Business Administration, the Tennessee Valley Authority, and the Appalachian Regional Commission.

Economic Development Assistance

Some farmers and other tobacco workers may seek off-farm jobs as an alternative to tobacco. Obviously, creating new jobs locally can encourage this strategy, but people displaced from tobacco work may need upgraded skills to qualify for jobs. Farmers and workers may need help in developing skills and education through community colleges, trade schools, GED course work, or other training programs. This assistance will be most needed in the most tobacco-dependent counties of central Kentucky and the Piedmont flue-cured region. Most tobacco communities have access to community or technical colleges, many of which have programs linked with specific local industries to develop skills needed by those industries. Improved skills and education may also qualify tobacco growers and workers for jobs outside their community. Proposals directed at retraining and education have included education grants to tobacco farm families and job retraining assistance modeled on the Department of Labor’s Trade Adjustment Assistance Program for displaced workers.

The U.S. Department of Commerce sponsors a trade adjustment assistance program that provides technical assistance to businesses, which could be a model for assisting tobacco-related businesses. Another model for assisting economic development in tobacco communities is the Community Adjustment and Investment Program. This program provides credit through a partnership between USDA's Rural Business-Cooperative Service and the North American Development Bank to businesses in U.S. communities that have experienced significant job losses due to changing trade patterns with Canada and Mexico after passage of the North American Free Trade Agreement.

Some tobacco-reliant communities may respond to the loss of tobacco income by seeking to develop other agricultural enterprises. Others may target nonfarm development, and many will pursue both strategies. A host of governmental and other organizations could potentially play a role in development of tobacco communities, including State and local governments, USDA's Rural Development mission area, Federal economic development agencies, HUD's Community Development Block Grants, Cooperative Extension, universities, community and technical colleges, private foundations, and other alliances of farmers and busi-

nesses. Many of the entities listed above are already assisting tobacco communities. Some groups are working together in formal and informal alliances to plan for transition to nontobacco development. In 1998, a coalition of growers, public health interests, and State government representatives recommended the establishment of a new Federal commission, two regional farming community foundations, and a network of tobacco community councils to oversee tobacco transition assistance. Such a structure might bring more unity and synergy to tobacco community development efforts. Alternatively, USDA's Rural Development mission area might foster the development of a less formal regional compact. This has been done in other parts of the country to address region-specific problems. One example is the Northwest Timber Adjustment Initiative, which provides funding and technical assistance to timber-dependent communities in the Pacific Northwest that have been affected by changes in Federal land use policies. Other examples are the Delta Compact and the Colonias Initiative, which bring together governments and nongovernmental organizations to address the needs of poor areas in the Lower Mississippi Delta and the region along the Mexican border.

Conclusion

This report has presented information about the economic importance of tobacco and the likely economic impact of decline in the tobacco industry. Its aim is to inform policymakers, community and business leaders, farmers, and others who are concerned about the economic effects of antismoking policies.

Loss of tobacco income and jobs will have little noticeable long-term effect on the U.S. economy as a whole, but there will be difficult transitions for many farmers, workers, businesses, and communities. In the long run, workers, land, and capital released from tobacco-related activity will be shifted to other sectors, but there will be difficult transitions in the short run for workers with specialized skills and those with few alternative opportunities. Tobacco growers, manufacturers, and leaf dealers will be adversely affected, as will many small retail establishments that rely on

tobacco sales for a large share of their income. The Southern United States, where tobacco is grown and manufactured, will experience negative impacts, especially in the Piedmont area of Virginia/North Carolina and Appalachian burley-growing regions. In these regions, farms tend to be small, production costs are high, and relatively few alternatives are available. Elimination of the tobacco farm program would lead to dramatic changes in the structure of tobacco farming. Declining cigarette production will lead to the loss of high-paying jobs, but cities where tobacco manufacturing is important are experiencing healthy growth in other sectors.

A variety of different types of transitional assistance could aid workers, farmers, and communities in adjusting to a smaller tobacco industry. Much assistance is already available, but a coordinated effort to address the special problems of tobacco growers and their communities may be helpful.

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Appendix 1: The Tobacco Farm Program

The basic provisions of the current Tobacco Program that governs flue-cured and burley tobacco were implemented with the 1938 Agricultural Adjustment Act to ensure a steady and reliable supply of high-quality tobacco while minimizing income fluctuations for growers. Growers of each type of tobacco vote in a referendum every 3 years to determine their participation in the program. An affirmative vote makes growers subject to USDA rules and regulations applicable to that type of tobacco. Since its inception, flue-cured growers and burley growers have participated in the program every year but one. The program has two basic elements: (1) a support price that sets an effective minimum price, and (2) quotas that restrict the amount of tobacco that may be marketed. The program tends to enhance income to growers. It also stabilizes the market so that prices, income, and production fluctuate much less for tobacco than they do for other agricultural commodities.

After harvesting and curing their tobacco, farmers transport their leaf to a warehouse to be sold. The leaf is set out on the warehouse floor, where each pile or bale is inspected and given a grade. The grade determines the loan rate (support price) it is eligible for, since each grade has a different rate.¹ The auctioneer and buyers move across the warehouse floor, bidding on individual lots of leaf. Tobacco that fails to sell at a price exceeding its grade loan rate is either retained by the farmer or turned over to the cooperative in exchange for a nonrecourse loan equal to the grade loan rate less applicable fees. Grower-owned cooperatives purchase, manage, and store the tobacco until it can be resold. This process is funded by loans from the USDA's Commodity Credit Corporation. The loans are repaid, with interest, when the tobacco is sold. The No-Net-Cost provision, introduced in 1982, requires that all costs of the tobacco program be borne equally by tobacco growers and buyers. Each year, growers and buyers are charged an assessment to cover the costs incurred by the cooperatives in carrying out the price support program. The only costs to the government are modest administrative expenses.

¹The grade, or quality, is determined by the leaf's placement on the stalk, color, and other characteristics.

The annual flue-cured and burley price support is the level for the preceding year adjusted by changes in the 5-year moving average of prices (two-thirds weight) and the cost of production index (one-third weight).² The Secretary of Agriculture can change the support price between 65 and 100 percent of the calculated adjustment. The price support level for each type of tobacco is applied to each grade within that type. Grade loan rates are based on recent trends in market prices, loan holdings, and the shares of particular grades received under loan. The weighted average of various loan rates must equal the overall support level for each kind of tobacco. Other tobacco types have slightly different procedures for setting price supports.

The quota is the quantity of tobacco leaf that can be marketed by a grower during a given marketing year. The total quota for a given type of tobacco is set and then divided among individual growers in proportion to the quota they either own or rent. Quotas are set in such a way as to balance supply with anticipated demand and to prevent build-up of large stocks by the tobacco cooperatives. The quota is set by a formula that includes the manufacturers' purchase intentions, plus the 3-year average exports, plus an adjustment to maintain a preset stock level. The resulting figure can then be raised or lowered up to 3 percent by the Secretary of Agriculture. After the quota is set, it is adjusted by each grower over or under marketings from previous years. Brown (1995) points out that changes in demand for tobacco tend to be reflected by changes in quota (due to the inclusion of purchaser intentions and stock levels in the formula), while the price support tends to be more rigid from year to year, reflecting rising production costs.

Quotas were originally set based on historical production in the 1930's. Burley growers can lease or transfer quota to other growers, but quotas cannot be transferred across county lines (except for burley tobacco in Tennessee). Flue-cured growers cannot lease and transfer quota. Quotas may also be transferred by (1) selling or renting land which has been assigned a tobacco allotment or quota, (2) leasing quota to a grower in the same county as the original allotment (except for flue-cured), or (3) selling the quota to an active tobacco grower in the same county.

²Costs include general variable costs, but exclude costs of land, quota, risk, overhead, management, marketing contributions or assessments, and other costs not directly related to tobacco production.

Appendix 2: Tobacco-Growing Regions

Regional differences in tobacco farms are important, due to the differences in topography, soils, types of tobacco that can be grown successfully, and nonfarm economic opportunities in various regions. Flue-cured tobacco has been classified into four types, each associated with a different region. The Piedmont (type 11) encompasses the area along the North Carolina/Virginia border. The Coastal Plain (type 12) of eastern North Carolina accounts for the greatest share of tobacco sales. The Pee Dee-Lumber River (type 13) includes the southern part of eastern North Carolina and eastern South Carolina. The Georgia (type 14) region includes Georgia and northern Florida. USDA identifies only one type of burley tobacco (type 21), grown throughout Kentucky, much of Tennessee, and neighboring States. Other cigar, chewing, and smoking tobacco types are also grown in these regions, but production is much smaller, and detailed survey data on these types are not available. Other types of tobacco are grown outside this region in southern Maryland, Pennsylvania, Alabama, Wisconsin, Missouri, and the Connecticut River valley, but production is small and concentrated in a small geographic area.

This study analyzes 1995 Farm Costs and Returns (FCRS) and 1996 Agricultural Resource Management Survey (ARMS) data from a sample of farms that are representative of each of the tobacco regions. The FCRS survey for 1995 included 131 Kentucky and 104 Tennessee burley tobacco farms. (As appendix fig. 2 shows, burley is also grown in several neighboring States, but the survey included only farms from Kentucky and Tennessee.) The 1996 ARMS survey included 71 tobacco farms from the Piedmont Virginia/North Carolina region, 87 from the North Carolina Coastal Plain, 60 from the Pee Dee-Lumber River region, and 42 from Georgia. The text of this report includes discussion of a number of tobacco farm characteristics based on these sample surveys. In the remainder of this appendix, we use these data to describe differing characteristics of tobacco growers in Kentucky, Tennessee, and the four flue-cured regions.

Burley farms tend to be much smaller and burley growers have limited alternative economic opportunities. Production, yields, and reliance on tobacco are generally much lower in Tennessee than in Kentucky. Few of Tennessee's tobacco farmers rely on farming for living expenses. FCRS data show that net farm income aver-

aged \$3,800 per year for Tennessee tobacco farmers in 1995, and 30 percent of operators said they were retired. Tennessee farms averaged 123 acres, with only 3.6 acres of tobacco. By comparison, Kentucky tobacco farms averaged \$13,100 in net farm income, and only a few farmers in the FCRS sample said they were retired. Kentucky burley growers had larger acreage than Tennessee growers, but their farms were still relatively small. Kentucky farms averaged 170 acres, with 5.9 acres in tobacco. Tobacco generated 60 percent of the value of agricultural production on Kentucky tobacco farms and 40 percent on Tennessee farms. As discussed in the text of this report, alternative enterprises in the burley region cannot generate earnings comparable to those of tobacco, so tobacco's share of net earnings is probably much greater. According to our analysis of FCRS data for 1995, the mean acreage of nontobacco farmers in the burley region is similar to that of tobacco farmers, but nontobacco farmers earn far less net income from farming.

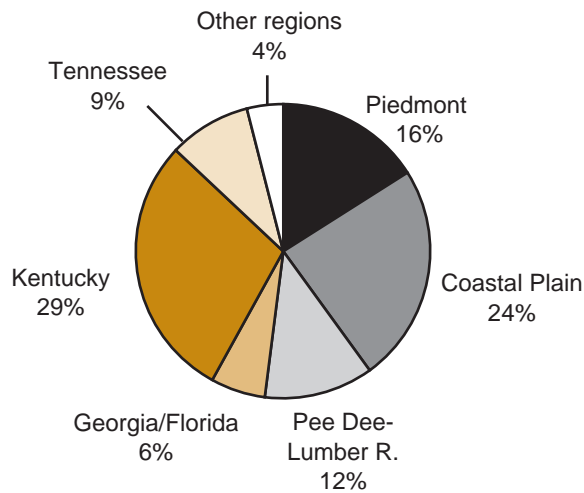
In general, tobacco farms in flue-cured regions are much larger and more diversified than burley farms. The Piedmont region is more similar to burley regions than are the other flue-cured regions. Piedmont farms are smaller than farms in other flue-cured regions, but they are still considerably larger than burley farms. Piedmont tobacco farms averaged 292 acres in 1996, with 29.6 acres of tobacco. About 30 percent of flue-cured farms are in the Piedmont region, but they account for only 23 percent of flue-cured production. Piedmont farmers are highly dependent on tobacco income, which accounted for nearly 90 percent of their total value of agricultural production in 1996. Tobacco accounted for about half of gross value of production for the agricultural sector of the Piedmont region in 1996, despite the fact that only 11 percent of farms grew tobacco. The topography and more extensive nonfarm land use in the Piedmont region makes expansion of farms difficult there.

The Coastal Plain is the major flue-cured tobacco production area, accounting for 41 percent of flue-cured farms and 44 percent of production. The soil and climate in this region are well suited to tobacco production, and the topography permits large-scale farming operations. Tobacco growers in this region averaged 419 acres in total, with an average of 42.8 in tobacco. Agriculture is more diversified in the Coastal Plain than in other regions. Tobacco accounted for only 20 percent of agricultural production in the region, and 30 percent of Coastal Plain farms grew tobacco in 1996.

Farms in the Pee Dee-Lumber River region are even larger than those in the Coastal Plain region. They averaged 586 acres, with 47.2 acres in tobacco. About 16 percent of flue-cured producers reside in the Pee Dee-Lumber River region and produce about 20 percent of the crop. This region is somewhat more dependent on tobacco than is the Coastal Plain region. Nearly half of the farms in the Pee Dee-Lumber River region raise tobacco and half of the region's value of agricultural production stems from flue-cured tobacco. The region's tobacco farmers are moderately dependent on tobacco production, with tobacco accounting for 66 percent of the region's total agricultural production value. Tobacco farmers in this region stand out from other regions in two aspects. On average, the region's tobacco farmers are younger than other tobacco producers, and they tend to have higher educational levels (see p. 21). These factors may make it easier for them to adjust to changing financial conditions as changes occur in tobacco programs.

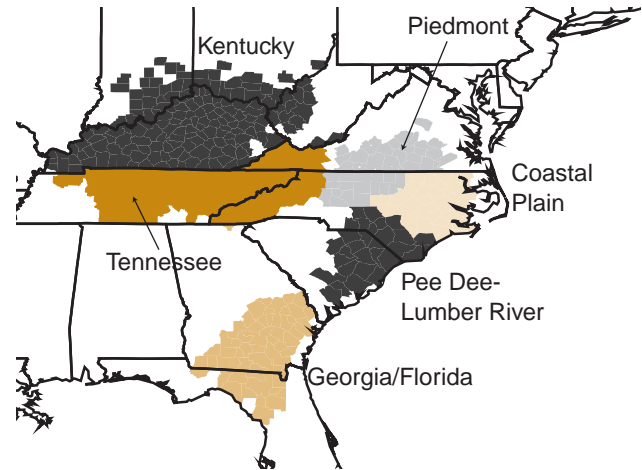
Georgia's flue-cured tobacco production region is the most agriculturally diverse. Only 14 percent of the region's agricultural production is derived from tobacco. Therefore, this region's agricultural economy is not as susceptible to negative impacts from declining tobacco demand as that in the other regions. Tobacco is raised by one out of four farmers in this region, with tobacco accounting for nearly 40 percent of these tobacco farmers' agricultural value of production. Therefore, most of Georgia's tobacco farmers will see some effects from the falling tobacco demand. Georgia tobacco farms are large, averaging 676 acres, with 32.8 tobacco acres. In 1996, this region accounted for only 12 percent of flue-cured production, but the region's share would likely increase if production were not restricted by marketing quotas. Some analysts have speculated that producers in this region might attempt to grow two tobacco crops per year if tobacco quotas did not restrict their production.

Appendix figure 1

Tobacco cash receipts by region, 1994-96

Source: Calculated by ERS using data from U.S. Bureau of the Census, *1977 Census of Agriculture*.

Appendix figure 2

Major tobacco-growing regions

Source: Economic Research Service, USDA.

Appendix table 1—Selected characteristics of tobacco production regions

Region	Geographic location ¹	Within tobacco type		Within each region		Average farm size ³	Average tobacco acres
		Tobacco production	Tobacco farms	Tobacco share of all production ²	Tobacco share of all farms		
		-----Percent-----				---Acres---	
Burley, 1995		100	100	NA	NA	154	5.1
Kentucky	Kentucky, southern Indiana, Ohio, West Virginia	87	65	37	51	170	5.9
Tennessee	Tennessee, western North Carolina, southwest Virginia	13	35*	7	21	123	3.6
Flue-cured, 1996		100	100	NA	NA	442	38.3
Piedmont	Virginia/North Carolina border	23	30	51*	11	292	29.6
Coastal Plain	Eastern North Carolina	44	41	20	30	419	42.8
Pee Dee-Lumber River	Southeast North Carolina, eastern South Carolina	21	16	49	49	586	47.2
Georgia	Georgia, northern Florida	12	13	14	26	676	32.8

*Coefficient of variation is between 25 and 50 percent, indicating low reliability of the estimate.

NA=not available.

¹Survey farms were located in these States only: Kentucky, Tennessee, Virginia, North Carolina, South Carolina, and Georgia.

²Tobacco share of value of all farm production in region.

³Average acres operated per farm.

Source: ERS analysis of 1995 Farm Costs and Returns Survey for burley tobacco and 1996 Agricultural Resource Management Study for flue-cured tobacco. Coefficients of variation (C.V.'s) of estimates are less than 25 percent unless indicated otherwise. The C.V. is computed by dividing the estimate's standard error by the estimate and multiplying by 100. Lower C.V.'s indicate more reliable estimates.

