Rural Economic Trends Following CRP's Implementation

While the CRP is *not* a community development program, its effort to reduce soil erosion and protect environmentally sensitive resources can affect local economies and populations. By providing a stable source of income to participants, it has been credited with allowing financially vulnerable farm operators to remain on the farm when they might otherwise have been forced to leave in search of other employment (Hodur et al., 2002; Mortensen et al., 1990; Nowak et al., 1990). And, by improving wildlife populations and helping to provide a cleaner and more scenically appealing environment, CRP may have contributed to the quality of life in many rural communities and helped support a growing tourist and recreation industry. On the other hand, by retiring productive farmland, CRP may have reduced demand for certain farm services, undermining the strength of local economies in farm-dependent areas. And, by making it easier for farm operators to retire from farming, CRP may have facilitated population outmigration from farming communities. These same effects can be viewed positively or negatively. For example, CRP may have allowed some isolated rural communities to protect open spaces by slowing sprawl (Johnson and Maxwell, 2001), while other communities might view this as an impediment to much needed growth.[24]

Local adjustments to economic and social shocks are complex and difficult to model. A community's reaction to CRP-induced changes in land use, purchasing patterns, and environmental quality will depend on the size and nature of the local economy and its relationship to regional and national markets, the quality of public and private community leadership, the adaptability of the workforce, and the size of the changes, among other things. Based on analyses of CRP's impact on rural communities over the years, it is clear that the size of the program relative to the local economy is critically important.[25] During its 17 years of existence, CRP has retired land in nearly 2,700 counties and has disbursed over $1.5 billion per year, on average, in direct payments. In the majority of cases, CRP enrollment is too small relative to the local resource base to have much of an effect on local communities. Program impacts should be easiest to detect among communities that were most dependent on the land enrolled in the CRP.

Two measures of CRP's local importance are used in this section (see box, "Measuring the Local Importance of CRP"). The first is the proportion of the area's total cropland enrolled in the CRP. This acreage-based measure is used to evaluate CRP's effect on beginning farmers—a group that is likely to be sensitive to CRP-induced changes in land-use patterns. The second is the size of an area's CRP rental payments relative to local income. This payments-based measure is used to evaluate CRP's effect on population and employment trends. The rental-payments-to-income ratio combines information on the value of the land being retired and the importance of the associated farming activity to the local economy. The higher the ratio, the larger the potential effect of CRP on surrounding communities.

[24] But, as Parks and Schorr (1997) make clear, CRP is of limited value in slowing urban sprawl in fast-growing metropolitan areas where the value of land for development dwarfs its value for agricultural production.

[25] Nearly every published analysis of CRP's community impacts focuses on areas of the country with high CRP enrollment. Analyses which report results for more than one area generally find that CRP's impacts varied with agriculture's importance to the local economy as well as the level of CRP enrollment (Hines et al., 1991; Hyberg et al., 1991; Martin et al., 1988; Otto and Smith, 1996; and Standaert and Smith, 1989).

Measuring the Local Importance of CRP

The measure of CRP's local importance adopted by the 1985 Act is the proportion of each county's total cropland enrolled in CRP. This is a reasonable metric when the primary concern is CRP's effect on farms and farm-related industries. Because we don't want our measure of cropland to be influenced by CRP, we use county cropland from the 1982 Census of Agriculture (4 years before CRP was implemented) as the denominator. The numerator is the average CRP enrollment within each county from 1991 to 1993. After 1990, the annual mean proportion of cropland enrolled in CRP among counties with acreage in the program varied little around the 1991-1993 average of 6.6 percent.

If the primary concern is with broader measures of community well-being, such as the change in county population, then CRP acreage relative to cropland may not be totally relevant. If farming is a minor source of economic activity, high CRP enrollment relative to cropland may have little effect on the local economy. A more direct measure is the local economic importance of resources retired by the CRP. The denominator is total household income received by county residents in 1985, adjusted for inflation. The numerator is the average annual CRP rental payment earned on the county's enrolled acres from 1991 to 1993. The annual mean payment-to-income ratio among participating counties was remarkably stable during the early 1990s at about 0.75 percent. The two measures of CRP's local importance are positively correlated, but they measure different aspects of the program's importance.

Since the focus of this section is on areas most likely to be affected by cropland retirement, only counties in which farm employment comprised more than 5 percent of jobs in 1980 are considered. Furthermore, only counties in the contiguous 48 States that had an urban population of less than 20,000 in 1980 are analyzed.[1] Alaska and Hawaii are unique enough to warrant exclusion, and more populated and economically diverse areas are unlikely to be measurably affected by CRP enrollment. The resulting universe is comprised of 1,481 counties located throughout the country, but concentrated most heavily in the Plains. These counties accounted for 79 percent of land enrolled in the CRP in both 1990 and 2002.

While the selection criteria provide a reasonably homogeneous group of observations for econometric analysis, the resulting counties still exhibit enormous variation in socioeconomic factors. This variability, coupled with the complexity of the economic growth process, invites erroneous estimates due to misspecified models. One approach involves the use of quasi-experimental, or matched-pair, control group analysis (Bohm and Lind, 1993; Reed and Rogers, 2003). Intuitively, if high-CRP (treatment) counties were compared with otherwise identical low-CRP (control) counties, differences in economic performance between the two groups would demonstrate the effects of high CRP enrollment. In reality, the matches are imperfect.[2]

However, the strong association between matched treatment and control counties simplifies statistical modeling by comparing growth processes in similar environments. By minimizing the effects of other growth factors, the effects of high-CRP enrollment should be easier to identify.

To apply this approach, the measures of CRP's local importance were used to identify high-CRP counties which had more than 5,000 acres enrolled in the CRP at some point between 1986 and 1995. Using the acreage-based metric, high-CRP counties had a ratio of CRP enrollment to cropland that exceeded 20 percent. There were 194 high-CRP counties based on 1991-93 enrollments. Using the payments-based metric, high-CRP counties had a ratio of CRP rental payments to total household income that exceeded 2.75 percent. There were 195 high-CRP counties based on 1991-93 rental payments. Fifty-six percent of high-CRP counties were classified as such by both measures.

Each high-CRP county was matched as closely as possible to a similar county which had a low CRP enrollment and payment ratio. Potential matches were restricted to study group counties which were not themselves high-CRP (based on either enrollment or rental payments) at any time during the program's history and which had CRP use measures that were less than 50 percent of the high-CRP county being matched.[3] Unique matches were selected which minimized the "Mahalanobis distances" between the high-CRP counties and all possible combinations of eligible low-CRP counties. The Mahalanobis distance measures the similarity between observations based on a set of key characteristics-the smaller the distance, the more similar the matching, based on the characteristics being examined.[4] Matches were based on county characteristics associated with population, employment, and beginning farmer trends. The aim is to find matched pairs of counties which were very similar before CRP enrollment began, and then compare their development as land is enrolled in the CRP.

For counties with high enrollment to cropland ratios, suitable matches were based on pre-1984 measures of the structure and type of farming in each county; the age, ownership, and off-farm work characteristics of farm operators in each county; and nonfarm characteristics that are related to farm structure, such as the county's population growth, racial mix, employment rate, and manufacturing base. For counties with high rental payments to income ratios, matches were based on pre-1984 measures of population growth, population density, commuting patterns, racial mix, mining employment, and the importance of Federal farm commodity program payments. In addition, contemporaneous measures of land in forest and the presence of natural amenities were included because historical data were not available.

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[1]Farm employment includes members of the farm operator's family employed on the farm as well as hired farm workers, and is from the 1980 Census of Population. An urban population cutoff of 20,000 (to focus on less-diversified economies) was chosen to coincide with the urban adjacency (or Beale) codes created by ERS.

[2]Ideally, counties should be similar in every respect except for the amount of CRP-eligible land, with low-CRP counties classified as such because land was ineligible based on environmental sensitivity criteria. Unfortunately, it seems likely that at least some low-CRP counties are such because eligible lands were too productive or too valuable for nonfarm uses to make enrollment in the CRP attractive. To the extent that considerations other than program eligibility led low-CRP counties to enroll fewer acres, our matched-pair comparisons will overstate the impact that CRP enrollment has on socioeconomic trends.

[3]Paired t-tests indicate that the mean values of CRP enrollment/cropland and CRP rental payment/income in high-CRP counties and their matches differ by more than two standard deviations, with a 99-percent level of confidence.

[4]The Mahalanobis distance metric takes the form $d^2(X_T,X_C) = (X_T-X_C)' \Sigma^{-1}(X_T-X_C)$, where X is the vector of selection variables, T is the treatment (i.e. high-CRP) county, C is a possible control county, d is the Mahalanobis distance between the two vectors, and Σ is the variance-covariance matrix of possible control counties (Isserman and Rephann, 1995).

In an effort to focus on areas that might be measurably affected by the CRP, we analyze two groups of counties: (1) nonmetropolitan counties with at least 5 percent of their workforce employed on the farm, and (2) counties considered "high-CRP" based on one of the ratios discussed earlier together with matching "control" counties having relatively low CRP ratios.[26] Figure 3.1 maps the 1,481 counties examined in this section as well as the high-CRP counties, as defined using 1991-1993 average enrolled acreage and rental payments.[27] While some of the effects of retiring agricultural land may be evident quickly, other effects may not be apparent for some time. To capture both short and longrun effects, a series of econometric models is estimated for different time periods to determine if and when local socioeconomic trends were influenced by CRP enrollment. The detailed regression results presented in this section are from the matched sample, which highlights differences between high- and low-CRP counties.

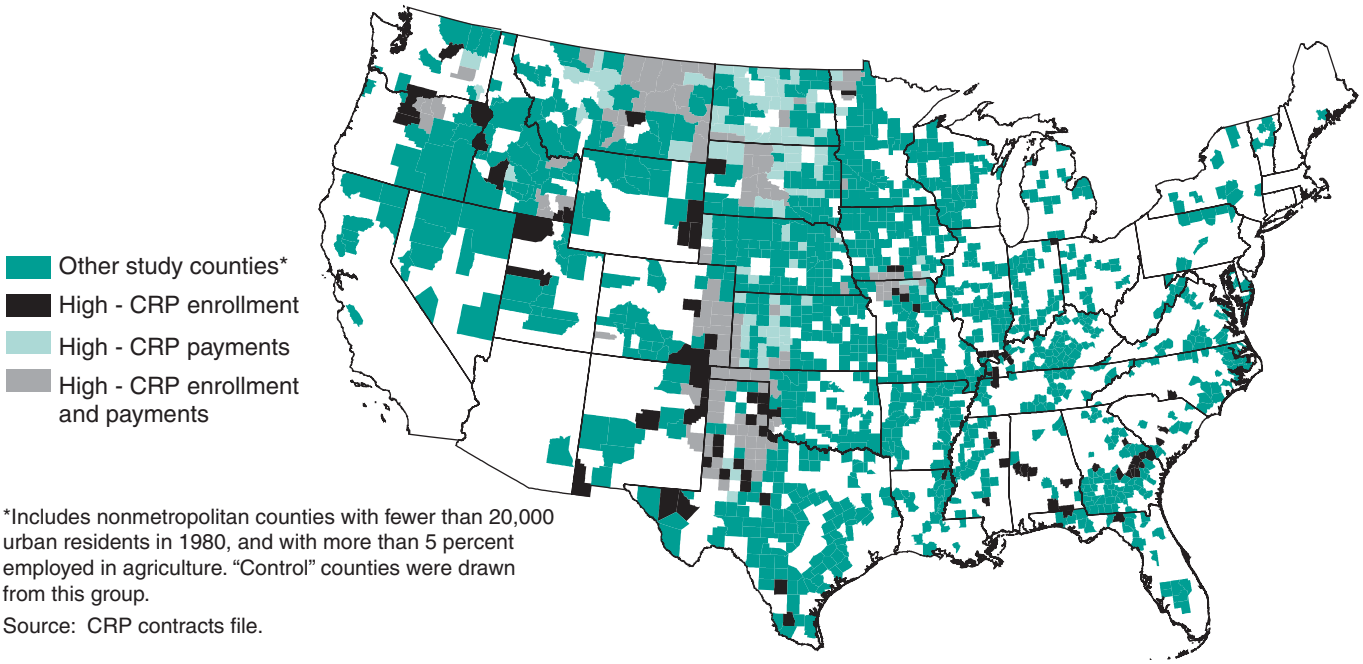
The CRP was initiated during a difficult period for farmers and farming communities. The farm sector was suffering its worst financial crisis since the 1930s when the 1985 Act became law. While agricultural exports, incomes, capital investments, and land values all surged in the 1970s, all of these indicators of financial well-being plummeted during the 1980s. As farmers went out of business, so did many community banks and local merchants. By 1986, when the CRP first began enrolling land, the farm financial crisis was still in full swing, with land values continuing their decline for another year or two (Collender, 1999). As a result, care must be taken to avoid blaming the CRP for the sectorwide problems of the 1980s or crediting the program for the subsequent sectorwide recovery.

To the extent that whole- and partial-farm enrollees use the program in different ways, the program's impact on the broader community may differ.

[26] Research has shown (and economic logic suggests) that the relative size of program impacts is likely to be greatest within small geographic units (Hamilton and Levins, 1998) and that program impacts vary from community to community within a local area (Henderson et al., 1992). Nonetheless, data limitations preclude examining impacts within subcounty units, such as towns and cities.

[27] The program was nearly fully implemented by 1993 and much of the available data ends in 1997. Changes in socioeconomic trends resulting from CRP enrollment in 1993 should be observed by 1997. Had a later period been used to measure CRP's importance, resulting socioeconomic changes in counties with recent enrollments might not be readily apparent in the 1997 data.

Figure 3.1
Counties studied to determine CRP's community impacts



*Includes nonmetropolitan counties with fewer than 20,000 urban residents in 1980, and with more than 5 percent employed in agriculture. "Control" counties were drawn from this group.

Source: CRP contracts file.

To allow for varying impacts, the regression analysis estimates whole- and partial-farm enrollment effects separately.[28] We also include the percentage of CRP payment outflows as a proxy for absentee ownership of CRP land. While we don't consider this a characteristic of the program as much as an indication of landownership patterns, these patterns can influence the impact that CRP has on local communities (see the previous section). When either the type of CRP enrollment or the flow of CRP funds is important to understanding CRP's community impacts, these relationships are fully explored.

[28] While whole- and partial-farm enrollments are highly correlated, the simple correlation coefficient is 0.61 for our acreage-based measure and 0.75 for our payments-based measure. Both of these coefficients are below the level commonly assumed to cause serious multicollinearity problems with estimated regression coefficients (Studenmund, 1997).

Population and Employment

To the extent that CRP enrollment represents a net reduction in the amount of land being cultivated within a local market, demand for agricultural inputs and marketing services would likely fall.[29] At a minimum, this would imply adjustments in the local labor market as resources shift from farm-related activities to other pursuits. Assuming that resources were previously being put to their most profitable use, land-retirement-induced adjustments could dampen the local economy unless new, more profitable opportunities arise. Furthermore, if institutional rigidities slow such adjustments, employment levels could decline even more than shifting demands would suggest. And, since migration patterns are sensitive to employment opportunities, pronounced shifts in a community's economy could also affect its desirability as a place to live and work, and ultimately its population level.

[29] Enrolling land in the CRP does not prevent other land from coming into production. Indeed, if commodity prices rise or agricultural input prices fall due to CRP land retirement, economic theory suggests that agricultural markets should adjust by increasing production, either by bringing additional land into production or by cultivating existing land more intensively. This phenomenon is referred to as "slippage" and would be expected to weaken CRP's economic impacts.

On the other hand, particularly during the early years of the program's operation, CRP rental payments may have helped many financially stressed farm operators stay on the farm. Whether as farmers, retirees, or nonfarm employees, CRP payment recipients may have helped stabilize the economies and populations of some farming communities simply by remaining in the area. By helping stabilize local land markets at a time when farmland values were falling, CRP enrollments may have helped nonparticipating farmers retain their operations. Over time, as CRP fostered increased populations and varieties of wildlife, a more diverse landscape, and a cleaner environment, increased recreational activities may have provided new job opportunities and increased the appeal of some farming communities as places to live.

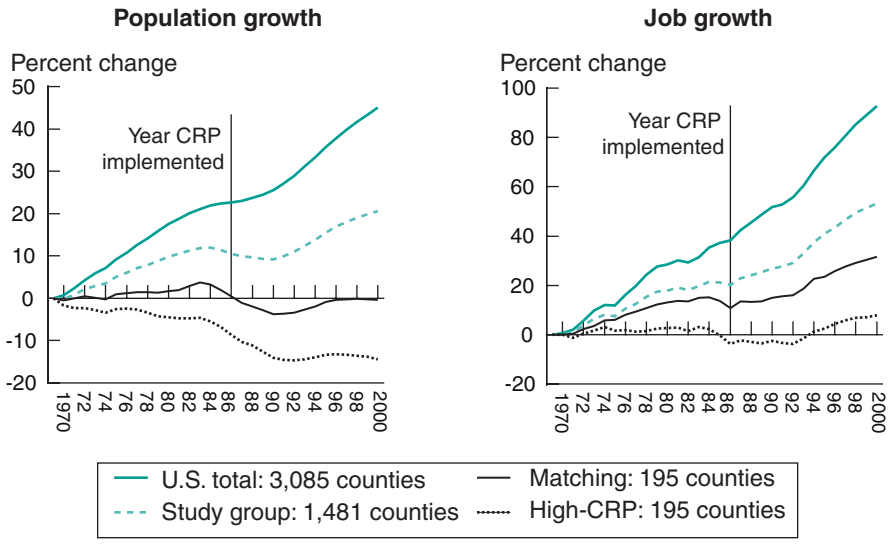
Do high levels of CRP enrollment *systematically* affect rural employment and population trends in the short or the long run?[30] One consideration with any attempt to analyze the relationship between CRP participation and population and employment trends is that CRP enrollment tends to be heaviest in the Plains States, where many counties have a long history of population decline. Changes in technology and sectorwide consolidation have reduced the farm population in these counties, and their remoteness and low population density have discouraged other employers from moving in. Of the 195 high-CRP payment counties analyzed in this section, nearly 3 out of every 4 lost population between 1970 and 1985 (before CRP was implemented).

[30] When analyzing employment trends, we examine changes in the number of jobs rather than changes in the number of employed persons. Throughout this section, we use employment and jobs interchangeably.

Thus, CRP participation is not randomly distributed with respect to economic and demographic trends. Figure 3.2 presents average long-term trends in population and employment for high-CRP counties, their matched pairs, all 1,481 study counties, and all counties in the 48 contiguous States.

Figure 3.2

Average population and employment growth trends, 1969-2000



Note: The CRP program started enrolling land in 1986, with enrollment reaching a stable level of 33 million acres by 1990.

Source: ERS analysis of BEA income and employment files.

It is clear that, as a group, high-CRP counties have long been prone to population loss and anemic employment trends. Their problems accelerated in the early 1980s, but farming communities nationwide were also experiencing population and employment problems. The policy issue is whether high enrollment in the CRP has made local economic conditions worse or better than they otherwise would have been. That is, counties with unusually high levels of CRP enrollment do worse, on average, than other rural counties, but it is unclear whether CRP enrollment contributed to this situation or merely reflects the greater appeal CRP has to eligible landowners in poorly performing economies.

County population and employment change are closely, but not directly, linked, since commuting patterns change, people enter and exit the labor force depending on the availability of jobs, and retirees migrate without corresponding effects on employment. Nonetheless, employment and population tend to rise and fall together and we use the same model to explain variation in both population and employment trends. Four basic groups of explanatory variables are used in the analysis: (1) prior-change measures of both employment and population; (2) economic measures, which generally relate more to employment change than population change; (3) quality of life/amenity measures, which primarily affect population change; and (4) demographic measures, which may affect both population and employment change. These measures and the modeling techniques are discussed more fully in Appendix A.

Figure 3.2 not only shows that high-CRP counties have been weak economic performers for the past 30 years, but they have done worse, on average, than the matching (low-CRP) counties. This reflects the limitations of the matched-pairs approach when the counties of interest are unique. In an effort to highlight counties that are most likely to be affected by the CRP,

we have isolated a disproportionate number of counties having few residents and small, relatively undiversified economies. Few counties with low CRP-payment-to-income ratios exhibited such extreme characteristics. As a result, the matching procedure reduces differences between high-CRP counties and the other counties studied, but it does not eliminate them. Regression analysis that analyzes patterns among all the study counties and between high-CRP counties and their matched pairs is used to correct for the differences in initial socioeconomic conditions.

The traditional growth model takes the form:

$$\log (J_{i,t} / J_{i,1985}) = f(CRP_i, \mathbf{X}_i)$$

where $J_{i,t}$ is the number of jobs in county i at time t greater than 1985, CRP_i is the local importance of CRP (i.e., the proportion of county cropland enrolled or the ratio of CRP rental payments to income) in county i during 1991-1993, and $\mathbf{X}_i$ is a vector of county i's pre-1985 socioeconomic and amenity characteristics hypothesized to influence local job growth.

For the matched-pair analysis, the difference in job-growth trends between high-CRP counties and their matches were estimated as a function of differences in explanatory variables between matched pairs of counties. That is:

$$(\log (J_{Tt}) - \log (J_{Ct}))_i = f((CRP_T - CRP_C)_i, (\mathbf{X}_T - \mathbf{X}_C)_i)$$

where J_{Tt} is the ratio of jobs in high-CRP county i at time t relative to jobs in 1985, J_{Ct} is the identical ratio for jobs in the low-CRP county uniquely matched with i, $(CRP_T - CRP_C)_i$ is the difference between CRP's local importance in high-CRP county i (the treatment county) and its matching low-CRP county (the control county), and $(\mathbf{X}_T - \mathbf{X}_C)_i$ is a vector of the differences between each explanatory variable in high-CRP county i and its match. This approach examined whether differences in development trends between high-CRP counties and their matches could be accounted for by differences in pre-CRP socioeconomic factors and CRP's local importance.[31] The rationale for adopting this econometric approach is discussed in Appendix A.

Between the matched-pair and study data sets, the different measures of CRP usage, and other variations as discussed in Appendix A, we have 20 different estimates of the relationship between CRP use and population and employment trends. This approach allows us to assess the consistency of the matched-pair estimations. Given that estimated coefficients can change from one model to the next, consistent estimates provide some confidence that the absence of statistical significance can be interpreted as "CRP has no effect," even though we do not know the probability of a Type II or false negative error. Since the absence of evidence is not evidence of absence, this approach helps to corroborate the findings from the matched-pair analysis.

The results, reported in table 3.1, report the sign of the CRP coefficient with respect to changes in population and employment over the short and long run. To determine whether there is any evidence that a meaningful relationship might exist, we report the number of times the coefficient is significant at the 80-percent level of confidence—far lower than is typically used to reject the null hypothesis. For those who want stronger proof that identified

[31] When parameters are estimated without a measure of CRP's local importance, the constant term measures the marginal effect on job growth trends of being classified as a high-CRP county. When CRP's local importance is included as an explanatory variable, the constant term is constrained to equal zero.

Table 3.1—Summary of CRP's estimated population and employment impacts

	Sign of CRP coefficients:			
	Positive		Negative	
	All	Significant	All	Significant
Population change				
1985-1992 (short term)	13	0	7	1 (0)
1985-2000 (long term)	17	4 (0)	3	0
Change in the number of jobs				
1985-1992 (short term)	0	0	20	11 (7)
1985-2000 (long term)	19	5 (3)	1	0

Note: The data refer to the sign and statistical significance on the CRP regression coefficient in 20 different versions of the growth model. A series of traditional growth models, using all 1,481 study counties and a series of difference-in-difference models, using the 195 matched pairs, allow the functional form and independent variables to vary. In each case, the dependent variable is the log of the ratio of population or jobs at the end of the period relative to 1985 (when matched pairs are analyzed, the dependent variable is the difference in the population or jobs log-ratio in high- and low-CRP counties). Statistical significance is based on a 2-tailed t-test at the .20 level with the number in parentheses significant at the .10 level.

Source: Economic Research Service, USDA.

relationships are less likely due to pure chance, the number of significant coefficients at the 90 percent level is reported in parentheses.

The results of the 20 regressions are broadly consistent. They provide no convincing evidence that CRP had a statistically significant negative effect on county population changes in either the short or long run. In fact, the results suggest that CRP may actually have been weakly associated with gains (or reduced losses) in population between 1985 and 2000, since most estimates suggest a positive relationship between CRP and population change. However, the coefficients representing the effects of CRP on population change were small and statistically insignificant at the 90-percent level of confidence. Thus, our conclusion is that the CRP did not tend to systematically reduce county population. This, of course, does not imply that no county lost (or gained) population because of its enrollment in the CRP. But high levels of enrollment in the CRP did not have a discernible *systematic* effect on population trends in rural communities once other factors were taken into account.

There is evidence that CRP was associated with job loss in the short run. All coefficients were negative, and in 7 of 20 cases the coefficient was statistically significant at the 90-percent level of confidence. However, this negative relationship did not persist over the longer period. Apparently, if negative effects existed, they were short-lived. Most models reported a positive relationship between CRP and employment growth over the long run. Since there was little evidence of a shortrun loss in population associated with CRP participation, it suggests that local economies were generally able to adapt to any loss in jobs associated with the CRP.

Table 3.2 presents the key results of a series of regressions on differences between high-CRP counties and their matched pairs. The first group of results (i.e., the "constant term") indicates that high-CRP counties had a significantly lower rate of job growth between 1985 and 1992. The second group of results shows whether differences in the size of the CRP payments-

Table 3.2—CRP's association with population and employment trends, 1985-2000

	Matched pairs[1]		Matched pairs/no mining[1]	
	Beta	Adj. R^2	Beta	Adj. R^2
Constant term[2]				
1985-1992 population change	-0.0099	0.32	-0.0032	0.40
1985-2000 population change	-0.0106	0.45	0.0198	0.48
1985-1992 employment change	-0.0293**	0.27	-0.0309**	0.32
1985-2000 employment change	0.0037	0.35	-0.0184	0.29
CRP payments/income ratio[3]				
1985-1992 population change	0.0011	0.39	0.0006	0.48
1985-2000 population change	-0.0011	0.50	0.0017	0.53
1985-1992 employment change	-0.0020	0.33	-0.0007	0.43
1985-2000 employment change	0.0014	0.38	0.0045*	0.37
CRP enrollment/county acreage ratio[3]				
1985-1992 population change	0.0000	0.39	-0.0001	0.48
1985-2000 population change	0.0023	0.49	0.0006	0.55
1985-1992 employment change	-0.0027*	0.34	-0.0028**	0.45
1985-2000 employment change	0.0009	0.38	0.0001	0.36

* and ** indicate the regression coefficient is statistically different from 0 at the .05 and .01 level of significance, respectively. Beta represents the standardized regression coefficient for the CRP variable. Adjusted R^2 indicates the portion of variation explained by the regression.
[1]See "Measuring the Local Importance of CRP" for a discussion of the matching process. There are a total of 195 high-CRP, low-CRP matched pairs; when counties with more than 5 percent employed in mining in 1980 are excluded, this number drops to 190.
[2]The model explains the difference in population and employment trends in high- and low-CRP counties as a function of the difference in socioeconomic variables between matched pairs of counties. The constant term is the equivalent of a dummy variable indicating membership in the high-CRP group.
[3]When the difference-in-difference equations include a continuous variable measuring CRP usage, the constant is constrained to equal 0.

Source: ERS calculations using data from the 1980 Census of Population, the 1982 Census of Agriculture, the Bureau of Economic Analysis, and FSA's CRP Contracts file.

to-income ratio had a significant impact on county trends. Here the results differ depending upon whether mining counties are included in the analysis or not. With mining counties excluded, job growth between 1985 and 2000 was positively related to CRP use.[32] The third group of results shows whether differences in the proportion of cropland enrolled in the CRP are related to differences in county trends. It appears that the relative size of CRP enrollment had a consistent, statistically significant, negative effect on job growth between 1985 and 1992, but little effect over the longer period. In general, excluding mining counties produced stronger and more consistent results. Therefore, the remainder of our analysis of changes in population and employment trends excludes counties with over 5 percent employed in mining in 1980.

The results of the analyses of changes in the number of jobs over 1985-1992 were somewhat puzzling. The consistent significant relationships involved the CRP acreage/total cropland acreage measure and the simple difference in employment change between the high CRP counties and their matches. There was little evidence that a very high ratio of CRP *payments to income* was associated with job loss in the short run, and the regression coefficient was positive in the long run. One possible explanation is that CRP-related job losses occurred in small agricultural services centers. Counties with the highest CRP-payment-to-income ratios have very low populations, and are almost exclusively involved in farming and lacking in nonfarm businesses. However, counties with the highest proportions of *land* in CRP may still include small towns that could be adversely affected by declining sales of farm inputs and services.

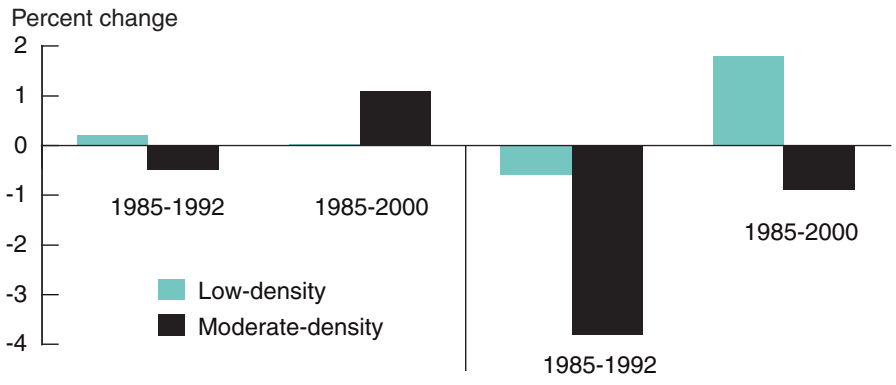
[32] Mining employment was very volatile during the study period with employment increasing rapidly in some areas and decreasing rapidly in others. As a result, neither a continuous variable measuring the proportion of local jobs in mining nor a dummy variable for mining counties was effective at capturing mining's impact.

To investigate this issue further, we focus on the matched-pair data set as these counties all have relatively low population densities.[33] We have no direct measure of the presence of small agricultural centers in these counties, but more densely settled rural counties are likely to have one or more small towns. By including a population density-CRP interaction term in the regression, we can measure CRP's differential impact on local communities as county population density varies.

Statistically, we want to determine whether the relationship between the CRP payment-to-income ratio and population or job trends changes as population density varies. Because agricultural service centers may have been losing out to larger centers during this period, we also include an interaction term (percent employed in agriculture multiplied by population density) to reflect any tendency for population or employment loss to be greater in more densely settled agricultural areas over the study period. The results of these analyses (see appendix table A.4) indicate that CRP did not systematically affect population trends in either low or moderate population density counties, but the negative effect of CRP on the number of jobs in the county was larger in more densely settled rural counties than in thinly settled counties.

Figure 3.3 shows the estimated impact that CRP had on population and employment change in our selection of moderate- and low-density rural counties as the difference in the ratio of CRP payments to income between low- and high-CRP counties increases from 0 to 4 percent. For low-density counties (those with fewer than two persons per square mile), CRP appears to have made little difference for population change in either the short or long term. For higher density rural counties (those with more than nine persons per square mile), the effect of a 4-percentage- point increase in the ratio of CRP payments to income on county employment growth was significant in the short run, but effects dissipated over time as local economies adjusted. We interpret these results to mean that CRP had its most negative

Figure 3.3
CRP's effect on population and job trends, by population density



Note: Bars represent predicted changes in population and employment due to an increase in the ratio of CRP payments to income. Predictions are determined by computing estimates with the CRP-payments-to-income ratio set to zero in both low- and high-CRP counties, recomputing estimates with the ratio set to 4 percent, and comparing the two estimates. Low- and moderate-density counties have fewer than 2 and more than 9 persons per square mile, respectively. The impact on population change is not statistically different from 0 at the .10 level.

Source: Economic Research Service, USDA.

[33] This analysis was also replicated for all counties remote from major cities and lacking towns of 2,500 or more. Analysis of these totally rural counties provided generally consistent results and for expositional ease will not be presented.

effects on jobs in counties with agricultural service centers, but that these net effects were largely confined to the short term.

These results are consistent with Martin et al.'s (1988) projections that CRP would negatively affect farm dependent communities in Oregon with small subregional agricultural supply centers. They expected farm dependent communities that were too small to support such centers ("low density" in our terminology) to be either unaffected or positively affected by CRP enrollments. Our results and the earlier forecasts by Martin et al. focus on small isolated farming economies. Larger, more diversified economies are less likely to be significantly affected by CRP's impact on demand for farm-related goods and services.

Thus far, we have tested for population and employment impacts as total CRP payments vary. However, whole-farm enrollments may have a different impact on population and employment than partial-farm enrollments. There is also a concern that any positive impacts CRP might have on the local economy would be weakened if CRP participants live elsewhere. To investigate these issues, we divide CRP enrollment into its various components and examine the relationship between these components and local population and employment trends.

It is often suggested that whole-farm CRP participation might be associated with lower county population growth. However, we found little evidence of this when we repeated the general analyses of population change using measures of both partial- and whole-farm participation. Coefficients for whole-farm participation were more likely to be negative than coefficients for partial-farm participation (particularly for population change between 1985 and 2000), but none of the whole-farm coefficients were statistically significant. For both partial- and whole-farm participation, CRP tended to have a negative association with employment change in the short term, but a positive association in the longer term. Our conclusion is that whether participation involved whole or partial farms has not made an important difference in population and employment trends.

Using a similar approach to distinguish CRP payments going to local residents from CRP payments going to absentee landowners, we examine whether CRP was more negatively related to population and employment growth when payments went outside the county. In this case, there were consistent if usually small differences (table 3.3). Where payments stayed within the county, CRP participation was more likely to be associated with growth. To the extent that payments went outside the county, CRP participation was more often associated with reductions in population and jobs. It is difficult to separate cause from effect here. CRP payments are more apt to contribute to local growth when the recipients are local. At the same time, areas prone to population loss and with few job opportunities may tend to have more absentee ownership. A third possibility is that absentee ownership itself (independent of CRP participation) leads to slower economic growth and outmigration. None of these explanations is completely satisfactory, however. They suggest a dampening of growth that would persist or even gain in importance in the long term. To the contrary, the negative relationship between outside payments and local growth, strong in 1985-1992, largely disappeared in 1985-2000.

Table 3.3—Summary of absentee CRP-landowner analyses

	Sign of coefficients							
	Positive		Negative		Positive		Negative	
	All	Significant	All	Significant	All	Significant	All	Significant
	CRP payments in county				*CRP payments out of county*			
Change in population								
1985-1992	6	0	2	0	0	0	8	0
1985-2000	8	1	0	0	4	0	4	0
Change in number of jobs								
1985-1992	4	0	4	**1***	0	0	8	**3**
1985-2000	6	**4**	2	1	3	0	5	0
Total (out of 32)	24	**5**	8	**2**	7	0	25	**3**

*Numbers in bold indicate that at least one coefficient was significantly different from zero at the .10 level.
Note: Counties with over 5 percent employed in mining in 1980 were excluded. The data refer to the sign and statistical significance of the in-county CRP payments and the out-of-county CRP payments regression coefficients in 8 different versions of the growth model, where the functional form and the list of independent variables vary across models. In each case, the dependent variable is the log of ratio of population or jobs at the end of the period relative to 1985 (when matched pairs are analyzed, the dependent variable is the difference in the population or jobs log-ratio in high- and low-CRP counties). Statistical significance is based on a 2-tailed t-test at the .20 level.

Source: Economic Research Service, USDA.

Given anecdotal evidence and the widespread belief that high levels of CRP enrollment have contributed to a decline in the population of nearby communities, it is somewhat surprising that we could find no convincing evidence linking the CRP to these declines.[34] As with any statistical analysis, it is possible that there are factors we did not account for that, if included, would have shown that CRP had an effect (either positive or negative) on population trends in some rural counties. However, given the breadth of factors incorporated into our models, this seems unlikely. A second explanation may have more credence. Our analysis is conducted at the county level (the smallest unit for which appropriate data are available), whereas much of the anecdotal evidence being reported concerns cities and towns. It is likely that the percentage of cropland enrolled in the CRP is much higher within small geographic areas than it is for the associated county as a whole. Therefore, individual towns may be affected as land is taken out of production and jobs shift elsewhere within the county.

High CRP participation was associated with lower net gains (or higher net losses) in jobs, but this pattern was largely confined to more densely settled rural counties—ones that typically have small agricultural centers—and did not persist in the long run (1985-2000). Apparently, the economies in these areas were able to generate alternative sources of employment over time. In general, more densely settled rural areas have been less prone to population and job loss than more thinly settled areas. CRP participation has not been a factor in low-density areas that have had the greatest problems with population loss.

[34] For example, in "Montana Town's Boys Are Its Last Gasp of Hope," Blaine Harden of *The Washington Post*, blamed CRP for depopulating small farming communities. The National Grain and Feed Association makes a similar claim in its 2001 white paper on farm policy issues.

Farm-Related Businesses

Our analyses of aggregate employment trends in high-CRP counties suggest that CRP generally had a small impact on employment which dissipated over time. Even so, the removal of a significant amount of cropland from production is likely to have had a major effect on one segment of the local economy—local farm-related businesses. Businesses supplying local farms with inputs and marketing services—farm machinery and input suppliers, grain elevators, and local trucking establishments, for instance—may have faced cutbacks that were masked in our analyses of overall employment change. There is ample literature arguing that the CRP reduces input use and, by implication, would reduce employment in businesses serving crop producers (Abel et al., 1994; Hyberg et al., 1991; Standaert and Smith, 1989; Taylor, 1988). And our analysis does show that CRP's impact on jobs appeared to be strongest in counties that were likely serving as local agricultural service centers where farm-related employment would have been relatively important.

Unfortunately, data limitations hindered our ability to assess CRP's industry-specific impacts. Confidentiality concerns make it difficult to access data on jobs by industry in small local economies.[35] The Census of Population has limited industry detail and is only available every 10 years, making it unsuitable for our purposes. Data for wage and salary workers are available annually from three sources: County Business Patterns (CBP), the Bureau of Labor Statistics' Covered Employment and Wages (CEW) data, and the Bureau of Economic Analysis' Regional Economic Information System (REIS). For all three, however, publicly released data are incomplete due to data suppression.[36]

The only county-level information available on detailed industries was CBP data on the number of establishments with at least one employee.[37] Since the number of establishments may decline due to industry consolidation as well as unfavorable business conditions, these data need to be treated cautiously. In particular, it is inappropriate to interpret a decline in establishments as necessarily indicating that employment declined. As firms consolidate into fewer establishments industry employment may not be affected. But at any point in time, the pattern of business closures among counties is likely to reflect, albeit imperfectly, differences in the business climate from one county to the next. To set the analysis of farm-related establishments in context, information on total nonfarm establishments and employment has been included here as well.

Farm-related enterprises were defined as agricultural services, farm suppliers, and most food processors relating to crops (see table A.4 in Appendix A). Since they would likely be less affected by CRP, establishments devoted exclusively to livestock, such as meat processors and veterinary services, were excluded from our count of farm-related establishments. In 1975, the first year for which data were available, on average there were 12 farm-related establishments serving high-CRP counties compared with about 15 in the other study counties. However, farm-related establishments constituted a larger proportion of *all* nonfarm establishments in high-CRP counties (10 percent) than in other study counties (5 percent) because high-CRP counties have less nonfarm activity.

[35] To protect confidentiality, industry data on employment and wages are not released for counties where the number of establishments is small or where there is one dominant employer.

[36] ERS has arranged to obtain unsuppressed CEW and REIS data for counties in States that give the Bureau of Labor Statistics permission to share the data (all but about 5 States have done so for 2000 data). However, ERS is only now receiving these data and was unable to use them for this report.

[37] In 1998, this data series switched from the Standard Industry Classification System to the North American Industry Classification System, so time-series comparisons can be made only up to 1997.

Table 3.4—Changes in nonfarm establishments and jobs, 1975-1997

Establishment type and period	High-CRP[1]	Low-CRP	All study counties
	Annualized growth rate (percent)		
Farm-related establishments			
1975-1985	-0.7	-0.2	-0.6
1985-1992	-1.1	-1.5	-1.3
1992-1997	-0.6	-0.2	-0.1
All nonfarm establishments			
1975-1985	0.7	1.2	2.0
1985-1992	-0.5	0.0	0.5
1992-1997	1.0	1.3	1.8
All nonfarm jobs			
1975-1985	0.7	1.2	1.9
1985-1992	0.4	1.3	1.6
1992-1997	2.2	2.4	2.8
1997-2001	0.6	1.0	1.1

[1]High-CRP counties have an average CRP rental-payment-to-income ratio for 1991-93 exceeding 2.75 percent. Of the 1,481 study counties, 195 were high-CRP by this definition. Low-CRP counties were selected from the study counties because of their similarity to high-CRP counties, but with relatively low payments-to-income ratios.

Source: Establishment data are from County Business Patterns and excludes public sector establishments. Job counts are from the Bureau of Economic Analysis REIS data file.

Rural counties have had a persistent loss of farm-related establishments since 1975 (table 3.4). The rate of loss was somewhat higher during 1985-1992 than either before or after. This period included some very difficult years for agriculture as well as a national economic recession. According to these data, the rate of loss of farm-related businesses was at least as great in low-CRP and other study counties as in the high-CRP counties during this period. But given their greater share of economic activity in high-CRP counties, the loss of farm-related businesses may have had a greater impact on employment in high-CRP counties.

From 1992-1997, the rate of loss in farm-related establishments was greater in high-CRP counties than elsewhere. This trend is masked somewhat in the overall trends because the total number of nonfarm establishments and the total number of nonfarm jobs both increased over this 5-year period. Thus, while the local economies in high-CRP regions are not strong by any measure, they have been able to replace the loss of farm-related establishments over time. The adjustment process may not have been easy for those involved, but the trends suggest that CRP's net impact was small given the consolidation trends buffeting farm-related industries over the past 25 years or more.

In addition to its impact on demand for farm inputs and services, CRP can affect population and employment through its impact on farming opportunities.

Beginning Farmers

Within the context of rural community development, the ability of young and beginning farmers to successfully acquire control of the assets needed to create viable businesses is important in farm-dependent areas. The continuing rise in the average age of farm operators suggests that young families may be unable or unwilling to stay in (or migrate to) communities that are heavily dependent on agriculture for jobs. The average age of farm operators increased one full

year between 1992 and 1997 to 54.3 years. The rise in the average age of farmers reflects both the paucity of young operators entering farming and the aging-in-place of established farmers (Gale, 1993). From 1982 to 1997, the number of principal farm operators under 35 years of age fell 58 percent, while the number at least 65 years of age rose by over 25 percent**.**

Of course, beginning farmers don't have to be young. For purposes of qualifying for USDA targeted farm loan programs, the Agricultural Credit Improvement Act of 1992 defines a beginning farmer as an individual or entity who has owned or operated a farm or ranch for not more than 10 years.[38] While age and years of experience are highly correlated, beginning farmers come from all age cohorts. And whether young or not, beginning farmers can bring much needed vitality to farming communities. With few employment alternatives, if farming cannot support a stable population, many farming communities fear that depopulation is inevitable. Between 1982 and 1987, the proportion of farmers who had operated their farm for less than 10 years declined from 38 to 32 percent before stabilizing at 30 percent in the 1990s. The higher proportion of "short-tenure" farm operators when compared with young farmers may reflect the movement of older farm operators from one farm to another in response to urban sprawl, intergenerational transfers, the purchase of farms for retirement or as a lifestyle, and a host of other reasons. These farm location changes may involve inter-county migration in some instances, but in others they may simply reflect a reshuffling of available farmland.

Because the quantity of land is essentially fixed, one hypothesis is that land enrolled in the CRP reduces the supply of land available for agricultural production, putting upward pressure on farmland rental rates and purchase prices. This places beginning farmers, who may have limited financial resources, at a competitive disadvantage for control of available farm assets.[39] On the other hand, during much of the period we examine, CRP was enrolling less productive soils which may not have provided sufficient economic returns to support a viable farm operation.[40] When coupled with county enrollment limits, the decline and eventual elimination of commodity program land diversion requirements, and the ability to bring previously uncultivated land into production, it may be that CRP's impact on the availability of productive soils was too small to have much of an impact on local farmland markets.

The competitive position of beginning farmers is likely to be particularly sensitive to how land is enrolled in the CRP. Partial-farm enrollments are more likely composed of small plots of land that would not have been available for lease or purchase in the program's absence. These enrollments may have no direct effect on the availability of farmland for rent and could actually benefit beginning farmers who have such land enrolled in the program. Whole-farm enrollments, on the other hand, are more likely to involve tracts large enough to support viable operations. We therefore examine the impact of whole- and partial-farm enrollment on beginning farmers as well as examining CRP's overall impact.

As discussed earlier, our general approach is to examine the relationship between the ratio of CRP enrollment to total cropland and beginning farmer trends for various groups of counties. We have identified 194 "high-CRP"

[38] The Census of Agriculture has not explicitly requested information on beginning farmer status. However, it has requested information on the age of the senior operator and the length of time he/she has operated any part of his/her current farm. We use under 35 years of age (i.e., young) and under 10 years on the current farm (i.e., short-tenure) as proxies for beginning farmers.

[39] An analysis of Montana farm operator opinions about whether the CRP should be expanded showed that young operators were less likely to support expansion than were older farm operators, other things being equal (Saltiel, 1993).

[40] Highly erodible land is found across the productivity spectrum (Heimlich, 1989). However, the compensation system used until 1990 discouraged owners of more productive land from enrolling in the CRP.

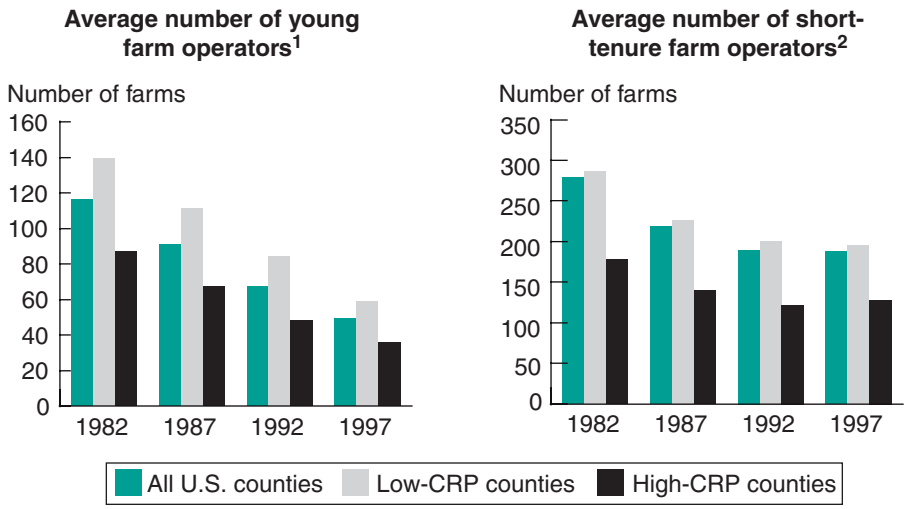
counties based on the proportion of cropland enrolled in the program. Figure 3.4 details beginning farmer trends for high- and low-CRP counties and for the United States as a whole.[41]

On average, high-CRP counties have fewer farms than low-CRP counties (presumably because of the former's concentration in the Plains), so it is not surprising that they also have fewer young and short-tenure farmers. On average, all counties experienced declines in the number of beginning farmers from 1982 to 1997, with low- and high-CRP counties following very similar trends to the United States as a whole.

A series of econometric models was estimated to determine the relationship between CRP enrollment and trends in the numbers of young and short-tenure farm operators. In addition to the ratio of acres enrolled in the CRP to acres of cropland (with CRP enrollment first estimated in the aggregate and then split into its whole- and partial-farm components), these models included other independent variables measuring the county's farm sector, economic, and demographic characteristics. The latter two categories of variables are identical to those in the population and employment models; the farm sector variables are discussed more fully at the end of Appendix A. Trends were measured over the years 1982-1997, spanning the years before the program began to the latest year for which Census of Agriculture data is available, as well as changes between each Census, (1982-87, 1987-92, and 1992-97). The principal results from a series of "difference-in-differences" equations based on 194 matched pairs of counties are reported in table 3.5.

Looking at trends from 1982 to 1997, it appears that there is no statistically significant relationship between the ratio of aggregate CRP enrollment to cropland and changes in the number of beginning farmers. However, when

Figure 3.4
Beginning farmer trends, 1982-1997



1 Young farm operators are principal farm operators under 35 years of age.
2 Short-tenure operators have operated their current farm for less then 10 years.

Source: Census of Agriculture and CRP Contracts file. Low-CRP counties have less than 12.5 percent of their cropland enrolled in the CRP. High-CRP counties have more than 20 percent of their cropland enrolled in the CRP.

[41] The 1,481 study counties are actually split among 3 groups: high-CRP counties (where CRP enrollment makes up more than 20 percent of cropland), low-CRP counties (where the CRP/cropland ratio is below 12.5 percent), and a middle group. For expositional ease, we ignore the middle group since it includes counties that are considered high-CRP based on other measures of the program's local importance, such as the ratio of CRP payments to income.

Table 3.5—CRP's association with young and short-tenure farm operator trends[1]

	Aggregate CRP model		Disaggregated CRP model		
Dependent variable	CRP/cropland Beta	R^2 (adj.)	Whole-farm Beta	Partial-farm Beta	R^2 (adj.)
Young farmers' growth rate					
1982-1997	0.105	0.28	**-0.217[a]**	**0.274****	0.30
1982-1987	-0.097	0.37	**-0.384****	**0.149[a]**	0.39
1987-1992	0.098	0.12	0.073	-0.030	0.11
1992-1997	**0.266****	0.23	0.051	**0.226***	0.23
Short-tenure farmers' growth rate					
1982-1997	0.029	0.28	**-0.386****	**0.295****	0.30
1982-1987	**-0.248****	0.35	-0.141	-0.145	0.35
1987-1992	**0.229****	0.16	0.104	0.134	0.16
1992-1997	**0.216****	0.21	**-0.259***	**0.467****	0.28

[1]Young farm operators are principal farm operators under 35 years of age. Short-tenure operators have operated their current farm for less then 10 years.

Note: Analysis of difference in trends between 194 high-CRP counties and their matching low-CRP counties. Results are first reported for the ratio of total CRP acreage to county cropland. The analysis is then redone with whole- and partial-farm payment ratios replacing the aggregate measure. Beta represents the standardized regression coefficient with the intercept constrained to equal zero. [a], *, and ** indicate that the regression coefficient is different from zero at the 10-, 5-, and 1-percent level of significance, respectively. Adjusted R2 indicates the portion of variation explained by the regression.

Source: Calculated from the Census of Agriculture, the CRP Contracts file, and the 1980 Census of Population.

CRP participation is divided into whole- and partial-farm enrollment, a striking pattern emerges. Beginning farmer trends are negatively associated with whole-farm enrollments and positively associated with partial-farm enrollments. Furthermore, when 1982-97 is broken into 5-year increments, *statistically significant* coefficients are always negative for whole-farm enrollments and are always positive for partial-farm enrollments. The partial-farm effect is strong enough to make the coefficient for total CRP enrollment positive in three of the four instances when statistically significant results were found. The only exception was 1982-1987, when sector-wide financial problems led to deteriorating beginning farmer trends.

But what is the root cause of these patterns? Does whole-farm enrollment reduce the availability of farmland to the detriment of beginning farmers or does the absence of beginning farmers encourage landowners who no longer wish to farm their land to enroll as much land as possible in the CRP? While we don't have a definitive answer, the farm financial crisis of the 1980s likely had a particularly large impact on young and beginning farmers in areas of the country with less productive soils. Since rental rates were low in these areas and returns to farming were not particularly promising, enrollment in the CRP program may have been unusually high. If so, high CRP enrollment, particularly in the form of whole farms, was the result of unfavorable farming conditions which also discouraged new entrants.

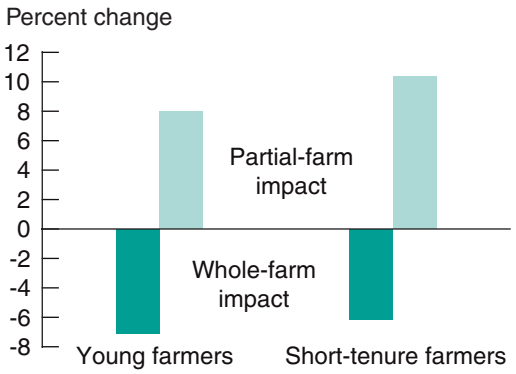
During the period when CRP enrollments were highest, higher CRP enrollment, particularly when accomplished though partial-farm enrollments, appears to slow the local decline in the number of beginning farmers based on our comparison of high- and low-CRP counties. This could be because partial-farm enrollment provided all participants, including beginning farmers, with some much-needed financial assistance. On the other hand, if local economic conditions and agricultural opportunities were encouraging, demand for farmland by both established and beginning farmers would be

high, increasing its rental value. Whole-farm enrollments would be less appealing in such markets, but partial-farm enrollments of marginal land would still be attractive since CRP enrollment reduces risk. Thus, CRP enrollment could be determined by demand for farmland by young and beginning farmers rather than affecting that demand.

When average CRP enrollment in 1991-93 is regressed against trends in the number of farmers (or beginning farmers) along with the other explanatory variables, statistically significant negative coefficients are consistently found for 1982-87 farm trends. For subsequent periods (1987-92 and 1992-97), the coefficients were positive. This is consistent with the view that the farm financial crisis of the 1980s encouraged CRP enrollment when the program became operational in 1986. Once established, heavy CRP enrollments then helped stabilize farm sector trends from 1987 to 1997.

To get a clearer idea of the relationship between CRP and beginning farmer trends *assuming the direction of causality goes from CRP participation to beginning farmer trends*, we use the estimated regression coefficients to calculate what would have happened to the growth rate of young and short-tenure farmers in the average low-CRP county had CRP enrollments been higher. Between 1991 and 1993, low-CRP counties had an average 4.8 percent of their cropland enrolled in the CRP: 1.6 percent as whole-farm enrollments and 3.2 percent as partial-farm enrollments. How might beginning farmer trends for these counties have differed if they had CRP enrollments comparable to the high-CRP counties? Figure 3.5 provides estimates of the growth rates for young and beginning farmers in the average low-CRP county between 1982 and 1997 if CRP enrollment had been at the high-CRP mean (26.8 percent of cropland: 11.1 percent in whole-farm and 15.7 percent in partial-farm enrollments).[42]

Figure 3.5
Estimated impacts of high levels of CRP enrollment



Note: Estimates represent the expected change in the growth rate of beginning farmers between 1982 and 1997 in the typical low-CRP county if the ratio of CRP enrollment to cropland increased to levels typical of high-CRP counties (i.e., increasing from 4.8 percent to 26.6 percent). Total CRP impacts are not significantly different from 0 at the .10 level.

Source: Economic Research Service, USDA.

Increasing the percentage of cropland enrolled as partial farms by 12.3 percentage points (to 15.7 percent) would have reduced the decline of young farmers by 8.5 percent in the average low-CRP county between 1982 and 1997. The impact on short-tenure farmers would have been nearly as great, resulting in a slower decline between 1982 and 1997. On the other hand, increasing the percentage of cropland enrolled as whole farms by 9.5 percentage points (to 11.1 percent) would have had the opposite effect on the rate of change of young and short-tenure farmers. While swings in CRP

[42] The measure of cropland used in this analysis is from the 1982 Census, so ratios greater than 25 percent are possible without requiring a waiver of the county enrollment cap if previously uncultivated land was brought into crop production after 1982.

usage of this magnitude are unusual, they may represent the experiences of high-CRP counties.

This analysis suggests that total CRP enrollment is not a major factor explaining declines in the number of beginning farmers in farm-dependent communities. Negative consequences associated with whole-farm enrollments are counteracted by the positive consequences associated with partial-farm enrollments. Absentee ownership of CRP land did not appear to affect beginning farmer trends.[43] Furthermore, relative to the consequences of technological advances, market trends, and other Federal policies, the impact of CRP on beginning farmer trends appears to be minor.

Summary and Caveats

Previous attempts to estimate CRP's socioeconomic impacts have relied on: (1) deterministic models of the local economy, most often based on input/output models; (2) surveys of program participants and local government officials; and (3) econometric analyses of similar types of programs. While each of these approaches is useful and can add valuable insight into the adjustment processes rural counties go through as they accommodate policy shocks, none can accurately evaluate what happened in response to changes in CRP enrollment. Input/output models are useful for predicting the local economic response to policy shocks *ex ante*, but they do not reflect actual *ex post* adjustments. Surveys of knowledgeable observers can provide a wealth of information about the local adjustment process, but respondents are seldom in a position to evaluate the simultaneous impacts of all changes affecting their communities. And econometric analyses of similar programs can provide hints about what might happen as land is enrolled in the CRP, but since program characteristics inevitably differ, the applicability of the results is always open to question. To our knowledge, this is the first systematic attempt to econometrically model the impact that CRP has had on rural counties nationwide based on observed data.

By looking at actual changes in socioeconomic indicators within a broad cross-section of rural counties, we have been able to identify the extent to which variation in CRP enrollment appears to be associated with several measures of community well-being. When statistical relationships were found, they tended to be most significant in the short run, with impacts dissipating over longer periods of time. Furthermore, our results suggest that the relationship between CRP enrollment and community well-being varies depending on community characteristics. For some types of rural counties, CRP appears to be associated with growth (or slower decline), while CRP seems to have the opposite effect in other areas.

This study has focused on areas of the country that are most likely to be affected by shifts in agricultural land uses—rural counties with at least a modest proportion of the workforce employed in agriculture. To isolate any potential impacts the CRP has, we further narrowed our attention to counties in which CRP enrollments or CRP payments were unusually large relative to the local cropland base or economy. Relying on fairly simple single-equation models to explain variations in growth trends and the difference in growth trends between high-CRP counties and matched "control" counties,

[43] When regressions were estimated to determine if the prevalence of absentee CRP landowners affects beginning farmer trends, no statistically significant relationships were found for young farmer trends, and only weak, inconsistent relationships were found for short-tenure farmer trends over 1982-87.

we found generally consistent results. With respect to population change, there is no convincing evidence that a high ratio of CRP payments to income has a negative effect, but it may have a weak positive impact in sparsely populated areas of the country over the long run. A high ratio of cropland enrolled in the CRP appeared to dampen job growth in counties likely to have small agricultural centers (isolated rural counties with moderate population density). But these negative effects were largely confined to the short run. No statistically significant evidence was found suggesting that whole-farm enrollments had a differential impact on population and employment trends.

It seems clear that participation in the CRP is itself a function of community well-being in addition to any impact program participation may have on nearby communities, so causality is difficult to infer. While the logic backing up the presumption that CRP enrollment had an effect on employment (whether or not employment prospects had any effect on CRP participation) is generally accepted in the economic literature, no such consensus exists for the relationship between CRP enrollment and beginning farmer trends.

We found that whole-farm enrollments are associated with more rapid decline in the number of beginning farmers while partial-farm enrollments are associated with slower declines relative to what would have occurred in CRP's absence. But since whole- and partial-farm participation are likely to be strongly related to trends and characteristics of the local farm and nonfarm economies, the underlying cause of the CRP-beginning farmer relationship is far from clear. In fact, the causality could easily be that the number of new and young farmers affects the amount of whole- and partial-farm enrollment, rather than the reverse. In areas where agricultural and off-farm work opportunities are good, demand for farmland by young and beginning farmers could encourage more partial-farm enrollments. In areas where agricultural prospects are not good, the dearth of beginning farmers could encourage whole-farm enrollments. To the extent that this is the case, CRP participation is not the driving force behind beginning farmer trends, but is merely an outgrowth of those trends. But whether a driving force or not, our analysis suggests that the net result is that aggregate CRP enrollment is not a major factor explaining declines in the number of beginning farmers between 1982 and 1997.

Thus, based on our analysis of socioeconomic trends in rural counties before and after CRP was implemented, it does not appear that high levels of enrollment had a permanent affect on county growth prospects. This does not mean that no business or community was hurt by the CRP. Indeed, our results suggest that businesses in small agricultural service centers may have experienced sharp reductions in demand as farmland was retired. As a result, high-CRP regions of the country may have experienced a disproportionate loss of local businesses and employment in farm-related industries. And, individual cities and towns may have faced difficult adjustments as CRP enrollment in their areas removed large amounts of cropland from production. But rural economies, even those in undiversified farm-dependent areas, appear to have been resilient enough to adapt to shifting demands and opportunities. CRP had few systematic overall effects discernible at the county level, and those that we found were small, on average, and short lived.