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Seasonal Employment and Welfare Use in California's Agricultural and Rural Counties

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Policy Research Program

CALIFORNIA POLICY RESEARCH CENTER

UNIVERSITY OF CALIFORNIA

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The views and recommendations in this report are those of the authors and do not necessarily represent those of CPRC or the Regents of the University of California.

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Executive Summary

Welfare debates typically focus on two groups: short- and long-term recipients. Short-term recipients descend into poverty once or twice in their lifetime and need temporary assistance to rebound from their misfortune. Long-term recipients fall into poverty and stay on welfare without working. In this study we consider a third group: seasonal workers who combine work in the summer (May through October) with welfare in the winter (November through April) to make ends meet.

Policymakers generally support providing short-term public assistance, or a "safety net," for those who fall into poverty for a year or two because of loss of a job, separation from a partner, or some other event that creates financial hardship. Long-term recipients present a greater challenge to policymakers because of uncertainty whether recipients' problems stem from circumstances beyond their control, their own irresponsibility, or the pernicious effects of welfare itself.

The welfare recipients we considered experience a seasonal cycle of jobs. These people are job-ready: They work in the summer, when the number of jobs in their area increases, yet rely on welfare virtually every winter, when seasonal jobs vanish. They do not fit the description of either group described above, and the TANF/CalWORKs program does not seem tailored to their situation.

Policy and Research Questions

To discern whether welfare patterns in rural and agricultural areas differ from those in urban areas, and if so, why, we considered five welfare-related questions:

Do welfare caseloads differ in agricultural and rural areas?

Because labor markets in agricultural and rural areas appear to be more seasonal than those in urban and suburban areas, seasonality might affect agricultural and rural county residents' movements onto and off of welfare.

Does the seasonal pattern of welfare usage in California vary by county type?

We used county-level information on welfare entrance and exit to learn whether the seasonal pattern of welfare use varies by county type. Agricultural and rural counties show the greatest seasonal effect.

Does the seasonal pattern of unemployment and employment in California vary by county type?

We show that unemployment and employment in California vary by county type: urban, mixed, rural, and agricultural. We reviewed seasonal variation in the eight economic sectors in the standard industrial classification: agriculture; manufacturing; trade; services; government; construction and mining; transportation and public utilities; and finance, insurance, and real estate.

Are changes in employment by sector related to welfare dynamics?

We confirm the linkage between employment and welfare dynamics, and for the agricultural counties we show that a 4% increase in the demand for agricultural labor leads to a significant decline in welfare caseload and a significant 2–3% expansion in the potential agricultural labor force.

What are the policy implications of seasonal welfare use for time-limited welfare?

The prevalence of seasonal welfare use in agricultural and rural counties means that time limits will affect welfare recipients in these counties differently than they do recipients in other counties: These working families will eventually lose the option of going onto welfare during the annual employment downturn and will be faced with either lowering their standard of living or moving to a new location to find work.

Methods and Data

To discern patterns of welfare behavior in rural and agricultural areas of California, we collected data on the economic, geographic, and demographic characteristics of all 58 counties, such as percent rural population, population density, unemployment rates, and percent farm- and agricultural-services employment. We then devised a four-part economic-demographic county typology.

There are 15 *agricultural counties*, which we define as having at least 11.5% agricultural employment. Counties with less agricultural employment fit into three categories, depending on their level of urbanization. Counties with more than 50% rural population and less than 11.5% agricultural workers are labeled rural. These 17 *rural counties* fall along the state's northwestern, northern, and eastern edges.

The remaining counties—less than 50% rural, with a lower percent of agricultural workers—fall into two groups. Twelve are highly urbanized, with negligible farm employment. These *urban counties* include four southern counties that compose the metropolitan Los Angeles and San Diego regions and seven counties that constitute the San Francisco Bay Area. Sacramento County is also heavily urbanized.

Fourteen *"mixed" counties* remain. Most have 5–11.5% agricultural employment and less than 20% rural population. They are primarily located around the major urban areas, with a few centered on moderate-sized cities (populations 27,000–85,000).

The 12 urban counties account for approximately 73% of the state's population and 71% of its welfare caseload; the 14 mixed counties, respectively 16.5% and 14.7%; the 17 rural counties, 2% and 1.8%; and the 15 agricultural counties, 8.8% of the population but 12.8% of the welfare caseload.

Findings

Welfare and Employment Dynamics by County Type

We found that the variation in welfare patterns across county types is largely driven by differences in their employment patterns: Higher rates of unemployment in the agricultural and rural counties helped explain the higher welfare use in these counties than in urban ones. The substantial seasonality in welfare participation among *agricultural counties* is largely explained by employment seasonality in agriculture and manufacturing. In *rural counties*, the seasonality in welfare use is explained not only by employment in agriculture and manufacturing, but also in the trade, service, and construction and mining sectors.

Welfare Dynamics by County Type

Over the 12-year period of our dataset (July 1985–August 1997), both welfare participation and its annual variability were higher in agricultural and rural than in urban counties. Among the four county types, agricultural counties had the highest percent of the population on aid (10.3%) and almost the highest annual variation (3.8%) in the percent receiving aid. Urban counties had the lowest: 5.7% and 1.4%. Rural counties exhibited the highest variability primarily because of the impact

of summer tourism. Mixed counties fell in between on both measures.

The greater welfare-participation variability in the nonurban counties results largely from their significant welfare-caseload seasonality: more welfare participation in winter than in summer months. This seasonality is most apparent in entry to welfare (the number of cases entering in a given month) and termination (the number leaving that month). We examined these entry/exit dynamics for both the unemployed parent program (U) for families with two parents and the family group program (FG) for families with an absent parent. Both types of cases exhibited seasonality, but it was more pronounced among U cases.

Unemployment Dynamics by County Type

Employment figures also helped explain welfare seasonality in rural and agricultural counties. Like welfare enrollment, unemployment is higher in nonurban counties during the winter months and lower in the summer months. To quantify the seasonal unemployment change by county type, we subtracted the unemployment rate at its lowest annual point from its highest. The decrease was largest for agricultural counties (5.8 percentage points, 17.2% to 11.4%). The decrease for rural and mixed counties was 4.9 and 2.4 percentage points, respectively.

Employment Dynamics by Economic Sector Across County Types

To further investigate the relationship between yearly employment and welfare variability by county type, we turned to 1985–1997 monthly employment data for the eight economic sectors. Employment in two sectors (transportation and public utilities; and finance, insurance, and real estate) as a percent of total employment showed negligible, if any, seasonality across the four county types, even when broken down separately by county. Service-sector employment (including hotels, amusements, and recreation services) also appeared constant when averaged over each county type, except for significant seasonality for Trinity and Mariposa (both have substantial summer tourism).

Government also exhibited substantial employment seasonality among all county types, but in the "wrong" direction: Like welfare participation, government-sector employment was higher in the winter and lower in the summer. The large drop in July and August was primarily due to the loss of summer employment for public-school teachers. This decrease did not affect welfare dynamics.

The manufacturing sector may also contribute to the variability in welfare participation in agricultural and rural counties. Manufacturing employment actually increased during the summer months for each county type: about 1 percentage point for agricultural, mixed, and rural counties, but much less in urban counties.

Seasonal welfare use in *agricultural* counties can apparently be largely explained by the seasonality of their agricultural and manufacturing employment. Summer agricultural employment increased 7.7 percentage points and manufacturing employment about 1.1 percentage points—almost 9 percentage points. In *rural* counties, welfare seasonality can be almost exclusively attributed to employment patterns in the agricultural, manufacturing, trade, and construction and mining sectors. Summer employment in each of these sectors increased by between 1 and 1.3 percentage points—about 5 total percentage points.

Policy Implications and Recommendations

Agricultural and rural counties account, on an annual average, for more than one-seventh of the California welfare caseload. Within this annual caseload, the number of welfare recipients in these two types of counties increases dramatically from the summer to the winter. Strong seasonal variation in the number of welfare cases also characterizes mixed counties, adding to the large seasonal welfare caseload variation for the state as a whole: The total California welfare caseload affected by seasonal factors doubles to well over one-fourth if mixed counties are included with agricultural and rural ones.

We conclude that the seasonality in welfare receipt is driven by labor-market factors. In agricultural and mixed counties, farm employment is the main cause. In agricultural counties, the changing demand for agricultural labor from winter to summer leads to a reduction in the welfare caseload that could supply 2% to 3% of the total agricultural workforce. Among rural counties the most important economic sectors vary, but are primarily agriculture, manufacturing, trade, service, and construction and mining. In some rural counties, summer welfare-caseload reductions provide a significant fraction of the seasonal workforce in these sectors.

The new TANF legislation and the CalWORKs program emphasize work and time limits for welfare recipients. Although California's time limits do not necessarily remove an entire family from aid, they will substantially reduce the degree to which welfare can provide income for seasonal workers beyond the cumulative time-limit period.

Seasonal workers might cope with—and public-policy decisions address—the impact of CalWORKs time limits in at least four ways.

First, seasonal workers who reach the time limit will stay where they are and find other ways to combine summer employment with winter unemployment. This would almost certainly mean that more families will have annual incomes below the poverty level.

Another possibility is that recipients who reach their time limit might get new, less-seasonal jobs or move elsewhere. But workers often have difficulty moving from either one type of job to another or one location to another. Furthermore, if a large number of seasonal workers do move to other areas, employers in seasonal industries must make up the workforce shortage either by finding laborers elsewhere or bidding up the price of labor.

A third possibility is that policymakers might modify CalWORKs time limits for counties with significant seasonal or persistent unemployment. This would allow seasonal workers to combine welfare with work and have enough income to lift them out of poverty. This approach, however, means that the government would be subsidizing the workforce for seasonal employers, providing incentives for workers to remain in areas with high unemployment rates, and extending families' involvement in a stigmatizing social-welfare program.

A final possibility is that unemployment insurance, or some variant of it, could be extended to seasonal workers. Unemployment insurance is seldom available to these workers, either because their work does not fall under a covered category or because they cannot stay employed long enough to qualify for its benefits. Such insurance would be less stigmatizing than welfare and would involve employers in providing part of the subsidy for its seasonal workers. However, many employers of seasonal labor would probably balk at the expense of such a program.

On the basis of our findings, we urge state and county policymakers to consider adopting the following recommendations:

Conduct a study specifically on the impact of CalWORKs time limits in rural and agricultural areas.

Because the group we have identified spends only about half the year on welfare, cumulative time limits will affect them later than those continuously on welfare. They will eventually be affected, however, and their responses to time limits will have an impact on the local labor market.

Consider expanding unemployment insurance to cover more agricultural jobs and seasonal agricultural employment.

Unemployment insurance covers only some agricultural employment, and its eligibility requirement for steady periods of employment often disqualifies agricultural workers. Expansion of unemployment insurance would reduce seasonal welfare use.

Consider alternative policy approaches to dealing with seasonal welfare use.

In conjunction with welfare administrators in rural and agricultural counties, state policymakers should mount a concerted effort to identify innovative ways to help workers who currently combine welfare with seasonal work. The challenge these workers face is to find ways to continue working during the long winter off-season. Meeting this challenge will require a mixture of supportive services, broader access to job opportunities (perhaps in other geographic areas), and training to enable them to take advantage of these new opportunities.

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Introduction

Welfare debates typically focus on two groups: short- and long-term recipients. Short-term recipients descend into poverty once or twice in their lifetime and need temporary assistance to rebound from their misfortune. Long-term recipients fall into poverty and stay on welfare without working. In this report we consider a third group: seasonal workers who combine work in the summer with welfare in the winter to make ends meet. Seasonal workers go onto welfare because of economic vicissitudes, but unlike short-term recipients, they encounter economic difficulties every year and return again and again to welfare. As with long-term recipients, seasonal workers have a long history of welfare use. But unlike long-term recipients, seasonal workers work every year. Policies designed for the first two groups, such as welfare time limits, do not directly address the needs of seasonal workers and their employment situation.

Policymakers generally support providing short-term public assistance, or a "safety net," for those mothers and children who fall into poverty for a year or two because of loss of job, separation from a partner, or some other event that creates financial hardship. By and large, there is agreement that welfare should provide help to these families because anyone could experience a period when help is needed. The 1996 welfare-reform act's new name for welfare, Temporary Assistance for Needy Families (TANF), emphasized this welfare role.

Long-term recipients present a greater challenge to policymakers because of uncertainty about the cause of recipients' problems (circumstances beyond their control, their own irresponsibility, or the pernicious impacts of welfare itself). Many recipients stay on welfare because of disability, lack of education, poor job opportunities, and because of welfare dependency or a resistance to finding their way off of welfare.

Policy positions on welfare have often depended upon whether policymakers and politicians focused on short- or long-term welfare recipients, without any standard definition of those durations. In the 1980s, researchers found an interesting paradox: The majority of welfare recipients are on for a short time (less than two years), *and* most of the people on welfare at any given time have been on for a long time (eight years or more) without getting a job.[1] This paradox is resolved by realizing that at any particular moment, the majority of welfare "slots" are held by long-term recipients, and the

Long-term recipients present a greater challenge to policymakers because of uncertainty about the cause of recipients' problems.

Time limits were meant to send a message to recipients that welfare should not last indefinitely.

remaining slots are filled by a very large revolving-door group of short-term recipients who rarely make use of the program more than once.

The federal TANF Program and the 1997 California Work Opportunity and Responsibility to Kids (CalWORKs) reform came down on the side of helping short-term recipients. Long-term recipients were limited to no more than five years of welfare during their lifetime, while providing them with some help to get jobs. Time limits were meant to send a message to recipients that welfare should not last indefinitely. Time limits also stimulated welfare agencies to focus on ways to help recipients get jobs through job-readiness, educational, or other support programs.

The welfare recipients considered in this report experience a seasonal job cycle: jobs in the summer and none in the winter. These people are job-ready: They work in the summer, when the number of jobs in their area increases, yet rely on welfare virtually every winter, when seasonal jobs vanish. They do not fit the description of either short-term or long-term recipients, and the TANF/CalWORKs program does not seem tailored to their situation. They do not need to be sent a message about working—they work when work is available—and job-readiness is not a problem for them; welfare time limits are. Although California's time limits do not necessarily remove an entire family from public assistance, they do substantially reduce the degree to which welfare can provide income for seasonal workers after the cumulative time limit is reached. For seasonal workers, time limits will mean that they will eventually face bleak winters with no jobs and diminished welfare support. This report considers the plight of these seasonal workers, and how policymakers could consider changing CalWORKs to address their needs.

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Policy and Research Questions

We considered the following five policy-related questions to discern whether and suggest why welfare recipients in rural and agricultural areas differ from those in urban areas:

Do welfare caseloads differ in agricultural and rural areas?

Because labor markets in agricultural and rural areas might be more seasonal than those in urban and suburban areas, seasonality might affect agricultural and rural residents' movements onto and off of welfare. For this to be true, welfare caseloads would have to be sensitive to labor markets. We summarize the research on how decisions to go onto welfare are sensitive to labor-market conditions, and we review how labor markets differ in agricultural and rural areas. Those studies suggest that welfare recipients in agricultural and rural areas might face problems different from those faced by recipients in urban areas.

Does the seasonal pattern of welfare usage vary by rural, agricultural, urban, and mixed county type in California?

After developing a typology of California counties (agricultural, rural, urban, and mixed), we used county-level information on welfare entrance and exit to determine whether the seasonal pattern of welfare use does indeed vary by county type. We found that agricultural and rural counties show the greatest seasonality. This finding suggests that there are seasonal welfare recipients in these areas who are different from the two primary groups (long-term and short-term recipients) who have been the major concern of most policymakers.

Does the seasonal pattern of unemployment and employment vary by county type in California?

We show that unemployment and employment vary by county type in California, and we consider seasonal variation in the eight individual economic sectors defined by standard industrial classification: (1) agriculture,[2] (2) manufacturing, (3) trade, (4) services, (5) government, (6) construction and mining, (7) transportation and public utilities, and (8) finance, insurance, and real estate. We show that the seasonality of welfare use in agricultural counties can be largely explained by the seasonality of agricultural and manufacturing employment. In rural counties, welfare seasonality can be attributed to employment patterns in the agricultural, manufacturing, trade, and construction and mining sectors (the service sector also matters in two rural counties). This finding suggests that the seasonality of welfare use in agricultural and rural counties is due to the lack of jobs in the winter.

We show that unemployment and employment vary by county type in California, and we consider seasonal variation in the eight individual economic sectors defined by standard industrial classification.

Are changes in employment by economic sector related to welfare dynamics?

Using multivariate statistical techniques, we confirm the linkage between employment and welfare dynamics. For the agricultural counties, we show that a 4% increase in the demand for agricultural labor leads to a decline in welfare caseload and a small but significant expansion (2–3%) in the potential agricultural labor force. A marginal expansion of this size can contribute significantly to wage stability because it substantially fills the increased seasonal demand for labor. This analysis shows how welfare has helped to support an experienced seasonal labor force for the agricultural sector, and it suggests a number of policy questions regarding welfare receipt and participation in the agricultural labor force.

What are the policy implications for time-limited welfare?

The prevalence of seasonal welfare use in agricultural and rural counties means that time limits will affect welfare recipients in these counties differently than in other counties. Families that work in the summer and go

The prevalence of seasonal welfare use in agricultural and rural counties means that time limits will affect welfare recipients in these counties differently than in other counties.

onto welfare in the winter are neither short- nor long-term recipients. They are working families for whom annual downturns in the economy make year-round employment in their areas nearly impossible. Time limits mean that they will eventually lose the option of going onto welfare during the annual downturn. At this point they will be faced with either lowering their standard of living or moving to a new location.

Welfare Caseloads in Agricultural and Rural Areas

Interaction of Welfare and Labor-Market Dynamics

A primary path onto or off of welfare is a change in a household's attachment to the labor force, in income, or in the need for income. Families often enter welfare when a household head loses his or her job, a family breaks up and loses its primary wage earner, or the addition of a child requires an increased income. Families usually leave welfare when the head of the household gets a job, when marriage (or some other domestic arrangement) brings an earner into the household or makes it possible for the formerly single parent to get a job, or when children leave home. Attachment to the labor force and income, in turn, normally depend on the local demand for labor.

A long tradition of studies of aggregate welfare caseloads demonstrates that caseloads respond to economic conditions.[3] It has been harder finding linkages between individual behavior and labor-market conditions because of data limitations, even though it seems intuitively obvious that the local demand for labor should matter.[4] Recent work, however, has shown that employment conditions affect welfare participation decisions for individuals and households.[5] These studies provide strong evidence for the importance of economic variables for welfare dynamics, but because they typically involve such large geographic areas (entire states) and aggregate data (monthly or annual caseloads), the nuances of local labor markets are obscured (especially the differences among urban, agricultural, and rural labor markets).

Recent work, however, has shown that employment conditions affect welfare participation decisions for individuals and households.

Differences in Welfare and Employment Dynamics by County Type

Other research has suggested that the welfare-receipt patterns and the economies of rural and agricultural areas differ from those of urban and suburban areas.[6] Cumulatively, the studies demonstrate not only the importance of labor-market factors for welfare receipt in general, but also key differences found in non-metropolitan areas: a greater prevalence of welfare receipt, the impact of natural resource-based employment (e.g., in agriculture, forestry, mining, etc.) on welfare use, and a clear seasonal pattern of employment. What previous studies did not provide was a detailed picture of the *seasonal link* between welfare receipt and resource-based employment across different kinds of counties. This is what we sought to examine.

Seasonal Employment and Welfare Use in California

We used data about California counties to study welfare dynamics in its urban, mixed, agricultural, and rural areas. California, with about 12% of the nation's people, has a

welfare population that makes up about 20% of the national welfare population. In 1997, on average over 2.3 million people each month received welfare, including over 325,000 in agricultural counties alone.

In part, the total welfare population owes its size to that of the state population, currently about 34 million. The combined total population of the 15 California counties we classify as agricultural (3.1 million in 2000) is larger than the entire population of each of 19 states; the combined population of the 17 counties we classify as rural (715,000 in 2000) is about the same or larger than the populations of several states: Alaska, North Dakota, Vermont, and Wyoming.[7] And in part, the state's total welfare population owes its size to that of the California economy. The value of agricultural production in California alone is larger than that of the four predominantly agricultural states of Iowa, Kansas, Missouri, and Nebraska combined.

By using 12 years' worth of monthly California welfare and industry employment data (July 1985–August 1997), our study provides much greater detail over time on the impact of local labor markets on welfare participation than past studies have. With our fourfold county typology, we are able to show how counties with different kinds of economies have different welfare patterns.

In what follows, we first develop our county typology. We then describe aggregate welfare and employment dynamics in each county type. These results strongly suggest that rural and agricultural counties have significant seasonal dynamics that distinguish them from urban counties. Finally, we devise two statistical models, both of which independently demonstrate the strong link between employment cycles and welfare cycles. We conclude by drawing some policy implications from these results and making several recommendations to policymakers.

These results strongly suggest that rural and agricultural counties have significant seasonal dynamics that distinguish them from urban counties.

Classification of Counties

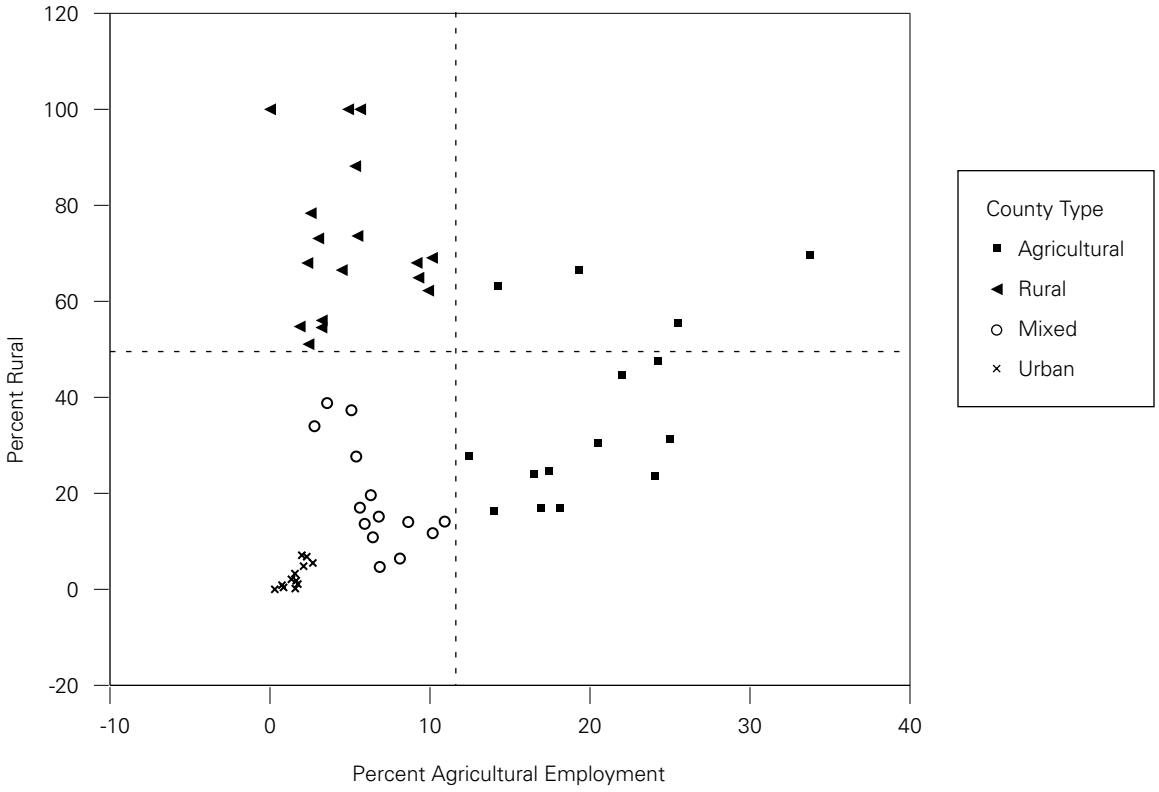
At the heart of our investigation is an analytically powerful way to classify counties. There are many ways to do this, but we focused on economic and geographic characteristics because there are reasons to believe they are especially important for welfare dynamics. Economic characteristics matter because they determine the types and number of jobs that are available. The role of geography is less clear, and there is a long-standing debate about what makes rural areas different from urban ones. Nevertheless, there is ample empirical evidence that welfare receipt and welfare dynamics differ between rural and urban areas. Probably the major geographic factors affecting welfare recipients are the limited choices of jobs in nonurban areas and the dependence on labor markets that are subject to greater seasonal fluctuations than those in urban areas.

To develop a meaningful typology combining economic and geographic factors, we collected data on the 58 counties' economic, geographic, and demographic characteristics, such as percent rural population, population density, unemployment rates, and percent farm and agricultural-services employment. We then used factor analysis and other data-reduction techniques to recognize groups of counties with similar characteristics.[8]

We placed California's 58 counties on a plot of percent rural by percent agricultural

Figure 1

California County Typology by Agricultural Employment and Urbanization



Sources: Authors' calculations based on the U.S. Department of Commerce (1992) and the U.S. Bureau of Economic Analysis (1993).

Note: The geographic distribution shown in Figure 2 is drawn from these calculations.

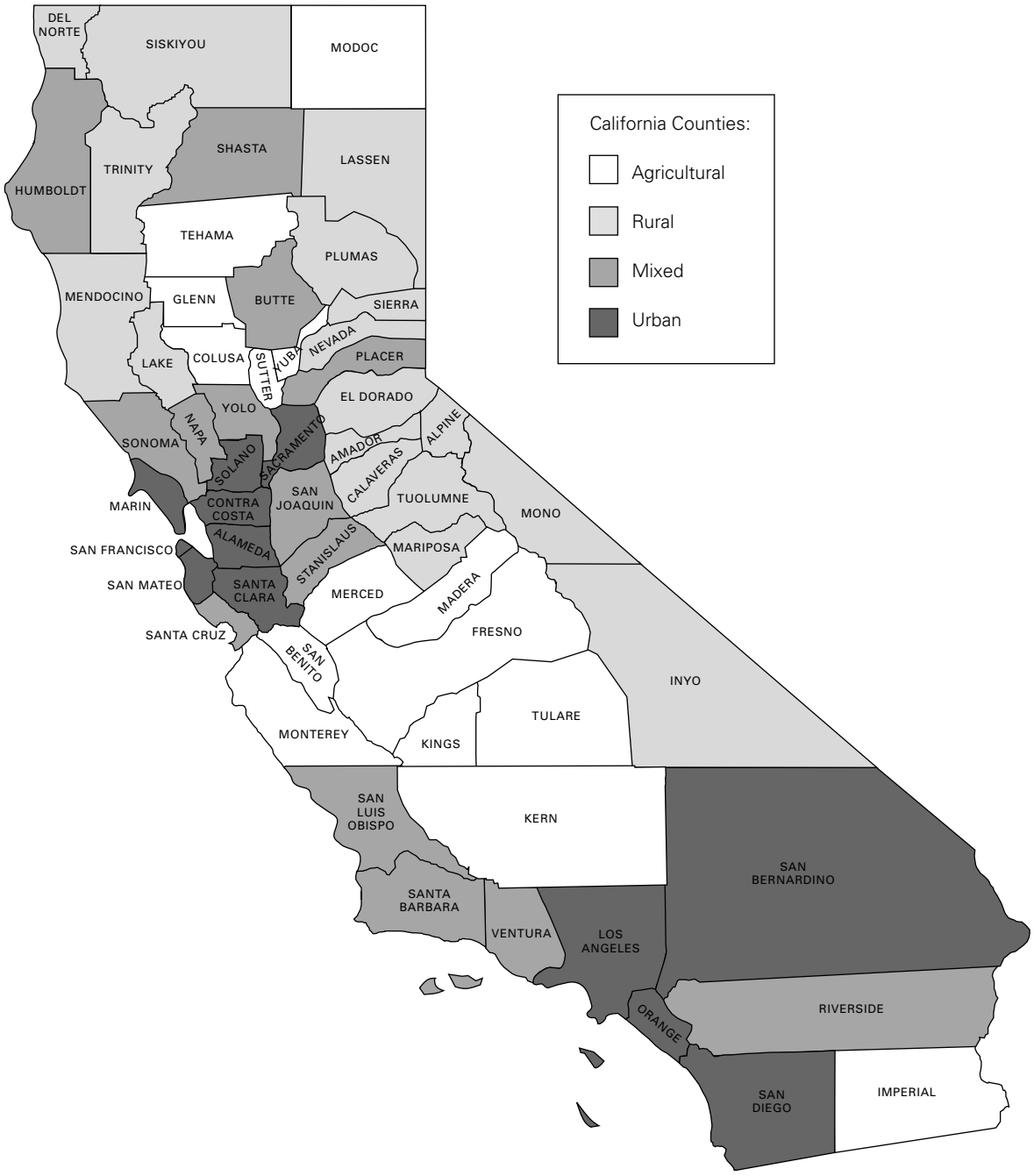
(farm- and agricultural-services) employment.[9] This produced four clusters of counties (Figure 1). We designated as agricultural the 15 counties with more than 11.5% agricultural employment (to the right of the vertical dashed line on Figure 1). Their geographic distribution can be seen in Figure 2. They are, not surprisingly, predominantly in California's heavily agricultural Central Valley.

Counties with less than 11.5% agricultural employment were designated rural, mixed, or urban, depending on their level of urbanization. Those counties with more than 50% rural population (above the horizontal dashed line on Figure 1) and less than 11.5% agricultural workers were labeled rural. These 17 rural counties fall along the northwestern, northern, and eastern edges of the state.

The remaining counties are less than 50% rural and have low levels of farm and agricultural workers. They fall into two groups. The 12 counties in the lower left-hand corner of Figure 1 are all highly urbanized, with negligible farming employment. These urban counties include four southern counties that compose the metropolitan Los Angeles and San Diego regions and seven counties that constitute the San Francisco Bay Area. Sacramento County in the Central Valley, where the state capital is located, is also heavily urbanized.

Figure 2

California County Typology: Geographic Distribution



The residual category, "mixed," consists of the remaining 14 counties. Most of these counties have between 5% and 11.5% agricultural employment and less than 20% rural population. They are primarily located around the major urban areas, although a few stand alone and are centered on moderately sized cities with populations between 27,000 and 85,000.

The 12 urban counties accounted for approximately 73% of the state's population and 71% of its welfare caseload. The 14 mixed counties made up approximately 16.5% of the population and 14.7% of the welfare cases. The 17 rural counties contained 2% of the population and 1.8% of the welfare caseload. The 15 agricultural counties contained 8.8% of the population and a disproportionately large share of the welfare caseload: 12.8%.

Welfare and Employment Dynamics by County Type

Using our classification typology, we found systematic differences in welfare and employment dynamics across county types. Both the level and annual variability of welfare use were higher in agricultural and rural counties than in urban ones. The greater variability in welfare participation among the nonurban counties was largely due to significant seasonality in those counties' welfare caseloads: Welfare use increased during the winter months and decreased during the summer months in the agricultural and rural counties.

We found systematic differences in welfare and employment dynamics across county types. Both the level and annual variability of welfare use were higher in agricultural and rural counties than in urban ones.

After establishing that different county types had distinct welfare patterns, we found that differences in employment patterns across county types largely accounted for the variation in welfare patterns. Specifically, higher unemployment rates in the agricultural and rural counties helped explain the higher welfare use in these counties compared with urban ones. The substantial seasonality in welfare participation among agricultural counties is largely explained by employment seasonality in the agriculture and manufacturing sectors. In rural counties, the seasonality in welfare use is explained not only by employment in agriculture and manufacturing, but also by employment in trade, service, and construction and mining.

Welfare Dynamics by County Type

To examine differences in welfare dynamics by county type, we relied on county caseload data collected by the California Department of Social Services.[10] These monthly data span a 12-year period from July 1985 to August 1997. Because our focus was on the average county within a county type, our statistics (such as welfare participation by county type) are simple averages rather than weighted averages that take into account the different populations of each county.[11]

Over the 12-year period of our data set, both the level and annual variability of welfare participation were higher in agricultural and rural counties than in urban ones.[12] These statistics are summarized in Table 1.[13] Among the four types of counties, agricultural counties had the highest percent of the population on aid (10.3%) and almost the highest annual variation (3.8%) in the percent receiving aid. Urban counties had the lowest percent of the population receiving aid (5.7%) and the lowest yearly variation (1.4%). Rural counties exhibited the highest variability primarily because

Table 1

Level and Variability of Welfare Participation and Unemployment by County Type, 1985–1997 (averaged)

	Level		Variability	
County Type	**Percent on Welfare**	**Unemployment Rate**	**Variation of Percent on Welfare**	**Variation of Unemployment Rate**
Agricultural	10.3	14.0	3.8%	20.0%
Rural	7.1	9.6	4.6%	26.0%
Mixed	6.6	8.1	2.6%	13.6%
Urban	5.7	5.5	1.4%	9.1%

Source: Authors' calculations based on data from the California Department of Social Services and the California Employment Development Department (2000).

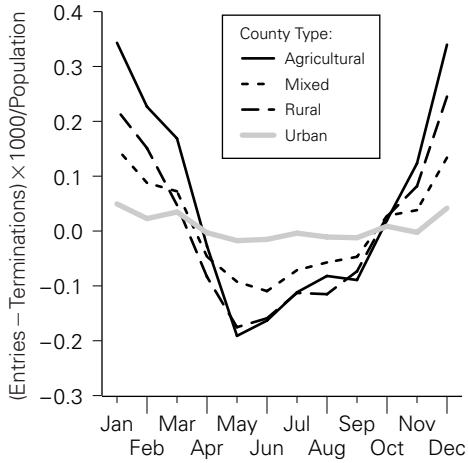
of the impact of summer tourism. Mixed counties fell in between on both measures.

The greater variability in welfare participation among the nonurban counties is largely a result of their significant welfare-caseload seasonality. These counties experience more welfare participation in the winter months than in the summer months.[14] This seasonality is most apparent when considering the dynamics of entry to welfare (the number of cases entering in a given month) and terminations (the number of cases leaving in a given month). We examined these dynamics for both subprograms of California's welfare program: the unemployed parent program (U) for families with two parents, and the family group program (FG) for families with an absent parent, usually a father.[15] Both types of cases showed seasonality, but it was more pronounced among U cases.

Figure 3 plots the average of the net number of new cases (entries minus terminations) divided by population (in thousands) for U cases by calendar month and county type. The vertical axis is the net number of new cases per 1,000 population. Figure 3 clearly shows the much greater seasonal variability in nonurban counties compared with urban counties. The net effect of this variability was a comparatively large drop in the caseload in nonurban counties over the summer and a large increase during the winter. The line for urban counties was almost flat (ranging from zero to 0.05), while the line for agricultural counties ranged from −0.20 to 0.35. Rural

Figure 3

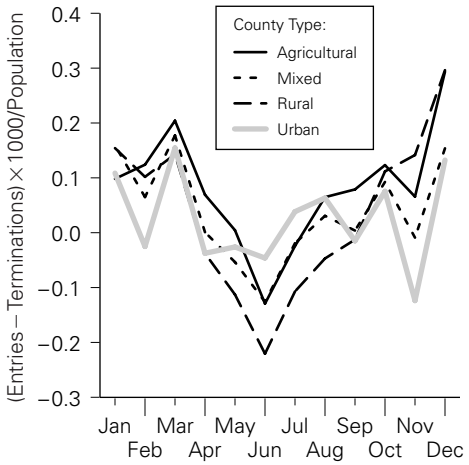
Net New Cases (U Cases) by County Type and Calendar Month, 1985–1997 (averaged)



Source: California Department of Social Services. *Public Welfare in California* Statistical Series (July 1985 to October 1997).

Figure 4

Net New Cases (FG Cases) by County Type and Calendar Month, 1985–1997 (averaged)



Source: California Department of Social Services. *Public Welfare in California* Statistical Series (July 1985 to October 1997).

counties showed almost as much variability as the agricultural counties, and mixed counties were, as might be expected, in between urban counties and agricultural/rural counties.

The same plots for FG cases are shown in Figure 4. With only one parent available to work, there has always been much less workforce participation in the FG cases than the U cases, so we would expect them to be much less sensitive to employment conditions. Figure 4 depicts the monthly changes in the net number of new cases (entries minus terminations) divided by population for nonurban and urban counties. As we would expect, the variation in these series was less than in the U cases, but the pattern was similar. Although there was substantial variability for urban counties, it did not seem to be seasonal, whereas the variability for agricultural counties clearly was. Seasonality also existed for both mixed and rural counties, but it was greater for rural counties.

Unemployment was higher in nonurban counties during the winter months and lower in the summer months, corresponding to the seasonal pattern of welfare participation.

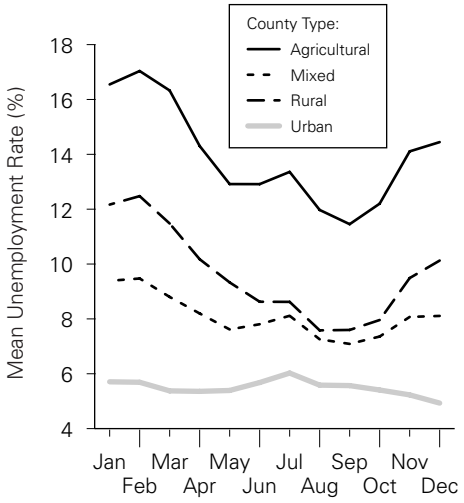
Unemployment Dynamics by County Type

Can the differences in welfare dynamics by county type be explained by differences in employment dynamics? We used monthly labor-force data by county from 1985 to 1997 to begin to answer this question.[16] As shown in Table 1, there was a strong positive relationship between the levels of unemployment and welfare participation: Both the level and variability of unemployment and welfare participation were lowest for urban counties, highest for agricultural counties, and in between for rural and mixed counties. This relationship is expected, given that an increase in unemployment is likely to increase the welfare caseload, and a decrease in unemployment is likely to decrease the welfare caseload. There was also a strong positive relationship between annual variability of both unemployment and use of aid. In counties where more people cycled on and off unemployment, more people also cycled onto and off of welfare.

Employment numbers also helped explain the seasonality of welfare dynamics in rural and agricultural counties. As shown in Figure 5, unemployment was higher in nonurban counties during the winter months and lower in the summer months, corresponding to the seasonal pattern of welfare participation shown earlier. To quantify the amount of seasonal change in unemployment by county type, we subtracted the unemployment rate at its lowest point in the year from its highest point in the year. From February to

Figure 5

Unemployment Rate by County Type and Calendar Month, 1985–1997 (averaged)



Source: California Employment Development Department. *Employment by Industry Data 1988–2000.*

September, the change in unemployment was highest for agricultural counties: a 5.8 percentage-point change, from 17.2% to 11.4%. The change in unemployment for rural and mixed counties was 4.9 and 2.4 percentage points, respectively.

Employment Dynamics Across County Types

To further investigate the relationship between yearly employment and welfare variability by county type, we used 1985–1997 monthly employment data for the eight economic sectors: agriculture; manufacturing; trade; services; government; construction and mining; transportation and public utilities; and finance, insurance and real estate. Policymakers need to know which economic sectors drive welfare dynamics in order to tailor policies accordingly. It is therefore important to move from aggregate employment to employment by industry. For example, if employment in the tourist sector is highly seasonal and a large share of total employment, policymakers can work with tourist-industry employers to devise policies that provide employment to tourism workers in the off-season.[17]

For employment within a specific industry to help explain welfare seasonality, that industry's employment rate must also exhibit seasonality. In addition, because people are more likely to leave welfare when they are employed, the seasonal employment pattern must be the reverse of the pattern for welfare participation: Employment must be higher in the summer months and lower in the winter months. To assess whether an industry's employment helped explain welfare seasonality, we plotted each industry's average employment (as a percent of the civilian labor force) for the 12-year period by calendar month.

Table 2 summarizes the extent to which each economic sector helped explain seasonal welfare participation in each county type. For each sector and county type, the table includes the difference in the percent employed between the summer month with the most employment and the winter month with the least employment.[18] Table 2 also shows how strongly an employment sector influences welfare variability ("Little," "Some," or "A Lot").

Two of the eight economic sectors—the transportation and public utilities sector and the finance, insurance, and real estate sector—showed negligible, if any, seasonality across the four county types, even when broken down separately by county. Employment in these two sectors (as a percent of total employment) remained essentially constant over the course of the year, and for this reason we do not present any figures for these two sectors in the following analysis.

Table 2

Difference in Employment Between Summer Month with Highest Employment and Winter Month with Lowest Employment, by Economic Sector and County Type, 1985–1997 (averaged)

County Type	Agriculture	Manufacturing	Trade	Construction & Mining	Service	Transportation & Public Utilities	Finance, Insurance & Real Estate	Government
Urban	0.2%	0.4%	–1.0%	0.4%	0.8%	–0.1%	0.0%	–1.1%
Mixed	2.3% Some	1.0% Some	–0.7%	0.6%	–0.4%	0.3%	–0.1%	–1.8%
Agricultural	7.7% A Lot	1.1% Some	–0.9%	–0.3%	–0.5%	0.3%	–0.1%	–2.3%
Rural	1.2% Some	1.0% Some	1.3% Some	1.1% Some	–0.8% Little	0.3%	–0.1%	–2.0%

Source: Authors' calculations based on data from the California Employment Development Department (2000).

Note: Shaded cells are sectors with little seasonal variability (less than 1%). In unshaded cells, the potential impact of an economic sector on welfare variability is indicated by "Little," "Some," or "A Lot."

Service-sector employment also appeared flat when averaged over each county type, but further examination revealed significant seasonality for Trinity and Mariposa counties. The service sector includes employment in hotels, amusements, and recreation services. Both Mariposa (where Yosemite National Park is located) and Trinity have substantial summer tourism.

Employment dynamics in a fourth sector, government, also exhibited substantial seasonality. However, as the minus signs indicate, the seasonal pattern was inverse rather than direct: Employment in the government sector, like welfare participation, was higher in the winter months and lower in the summer months. The large drop in government employment among all four county types during July and August was primarily due to the loss of employment for public-school teachers in those months. This decrease did not affect welfare dynamics.

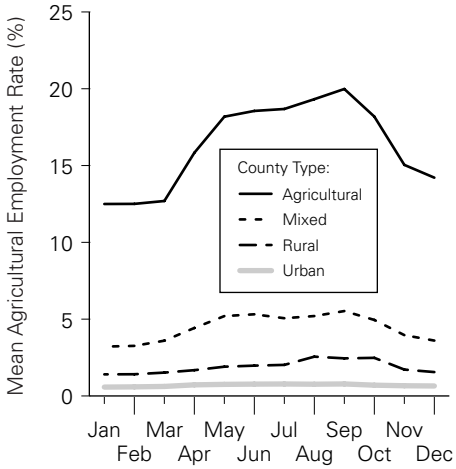
Mixed and agricultural counties exhibited significant seasonality in agriculture and manufacturing.

Employment in the remaining four sectors (agriculture, manufacturing, trade, and construction and mining) can help explain the seasonal welfare participation in nonurban counties, as summarized in Table 2. For rural counties, employment was significantly higher in the summer months than the winter months in all four sectors. Mixed and agricultural counties exhibited significant seasonality in agriculture and manufacturing.

Figure 6 displays agricultural employment by county type. The substantial seasonality in agricultural employment explains a significant amount of the variability in welfare caseloads for agricultural counties. To quantify the impact of seasonality on agricultural employment by county type, we calculated the difference in agricultural employment

Figure 6

Agriculture Employment by County Type and Calendar Month, 1985–1997 (averaged)



Source: California Employment Development Department. *Employment by Industry Data 1988–2000.*

between its lowest and highest points in the year. With a rise of 7.7 percentage points (from 12.1% to 19.8%), change in agricultural employment from January to September was highest for agricultural counties. The seasonal change for mixed, rural, and urban counties was 2.3, 1.2, and 0.2 percentage points, respectively. This change in agricultural employment from summer to winter for agricultural and mixed counties was the highest among the eight economic sectors.

The second employment sector that may contribute to the variability in welfare participation in agricultural and rural counties is manufacturing, covering both durable and nondurable goods. There was an increase in manufacturing employment during the summer months for each county type. The seasonal change in manufacturing employment was approximately 1 percentage point for agricultural, mixed, and rural counties, and a much smaller amount for urban counties.

Manufacturing, trade, and construction and mining helped explain the seasonality of welfare participation in rural counties. Employment in these sectors was higher in summer months than in winter months. Construction and mining employment increased by 1.1 percentage points in rural counties in the summer, and 0.6 percentage point in mixed counties. It showed a negligible increase in urban counties and a negligible decrease in agricultural ones.

Trade employment (which includes wholesale and retail) decreased in the summer for all counties except rural ones, where it increased by 1.3 percentage points. Because retail trade employment includes employment in eating and drinking places, food stores, and general merchandise, one would expect it to be responsive to seasonal tourism.

A closer look at rural counties indicates that their employment dynamics varied. For example, Mono County alone accounted for all the variation in employment in the construction and mining sectors for rural counties because of significant seasonal mining activity there. Mariposa and Trinity counties have seasonal service sectors owing to summer tourism. In five rural counties the number of the employed was largely attributable to agriculture, and in three by the manufacturing sector. Within the rural counties, we classified six subtypes: agriculture and trade (Del Norte and Lake); agriculture and manufacturing (Lassen, Mendocino, and Siskiyou); service (Mariposa and Trinity); construction and mining, and trade (Mono); nonfarm/

This change in agricultural employment from summer to winter for agricultural and mixed counties was the highest among the eight economic sectors.

In rural counties, welfare seasonality can be attributed to seasonal employment in the agriculture, manufacturing, trade, and construction and mining sectors.

nonagriculture mixed (Amador, Calaveras, Plumas, and Tuolumne); and counties with no employment seasonality (El Dorado, Inyo, and Nevada).

In summary, the seasonality of welfare use in agricultural counties can apparently be largely explained by the seasonality of agricultural and manufacturing employment. During the summer months, mean agricultural employment increases 7.7 percentage points and manufacturing employment by about 1.1 percentage points—a total increase in employment of almost 9 percentage points. In rural counties, welfare seasonality can be attributed to seasonal employment in the agriculture, manufacturing, trade, and construction and mining sectors. Employment in each of these sectors increased during the summer months by between 1 and 1.3 percentage points—a total increase in employment of about 5 percentage points. Service-sector employment also had some effect in two rural counties (Mariposa and Trinity).

Linking Employment Dynamics To Welfare Dynamics

The data presented in the preceding section suggest a strong link between employment and welfare dynamics, but they do not provide the degree of proof that multivariate statistical methods can provide. In a separate paper we have developed two statistical models of welfare entries and terminations for both families with an absent parent (FG cases) and two-parent families with one or more unemployed parents (U cases).[19] One model uses *aggregate county data*, and the other—an event-history model of terminations for FG and U recipients—uses *individual-level data*[20] (on employment and welfare participation) for the counties. Both models are briefly described in the appendix.

Here are our main findings from these models:

- Both the aggregate-level statistical model and the individual-level model data showed that a substantial amount of the variation in entries and exits could be explained by the ups and downs of employment.
- Employment status had a greater effect on welfare participation for two-parent families (U cases) than for single-parent families (FG cases).
- In agricultural counties, seasonal agriculture-sector employment had a large, significant effect on both entries and exits for two-parent cases and on exits for single-parent cases.
- In rural counties, seasonal retail employment helped explain variation in welfare exits for both single- and two-parent cases and variation in entries for two-parent cases. In rural counties, employment in other sectors also helped explain both entries and exits for two-parent cases.
- The average welfare recipient in either a rural or agricultural county had both more and shorter welfare spells than the average welfare recipient in an urban county. A person in an agricultural or rural county is therefore more likely than a person in an urban county to go onto welfare in a given

Employment status had a greater effect on welfare participation for two-parent families than for single-parent families.

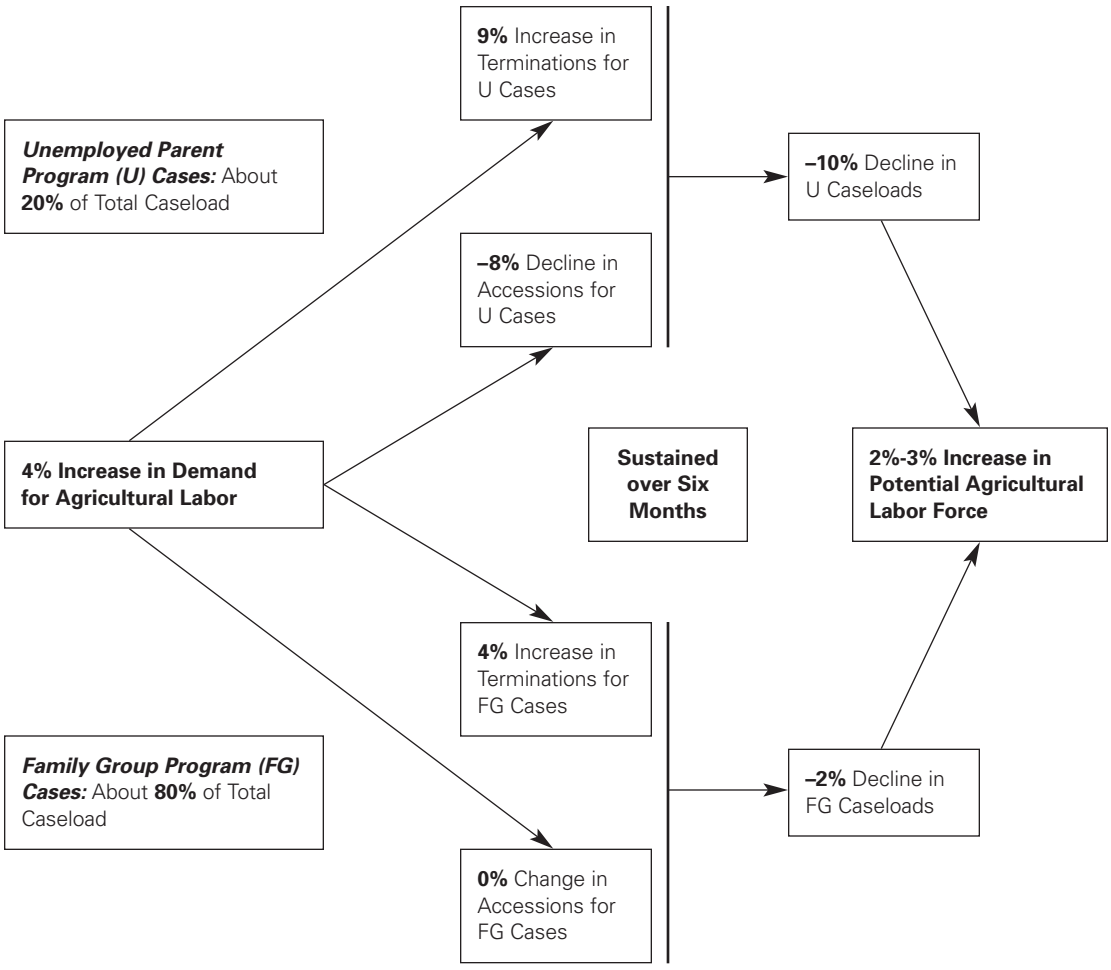
year; however, once on welfare, the person is more likely to exit before an urban recipient who began welfare at the same time.

The results obtained using these different models point to the same conclusions, providing us with substantial assurance of strong links between employment and welfare.

These estimations[21] have some important implications. Figure 7 illustrates the impact on the U and FG caseloads of a 4% change in the agricultural employment rate and the resulting effect on the labor available for the agricultural labor force. The data in this figure are calculated from the models described in the appendix and the data about the variation in agricultural employment and the distribution

Figure 7

Impact of a 4% Increase in Demand for Agricultural Labor on Welfare Caseload and the Potential Agricultural Labor Force



This small rise in the number of available workers prevents an upward pressure on the price of agricultural labor by helping to meet the increased seasonal demand.

of single- and two-parent cases in California counties.

The figure begins at the left-hand side by assuming a 4% increase in the demand for agricultural labor. (In fact, as we showed in Table 2 and Figure 6, the change from peak to trough is about 8%, but this amounts to an average increase of about 4% over six months.) This change affects both the U and FG caseload, but the U cases (20% of the caseload) are more affected. Terminations of U cases increase by 9%, and entries to welfare decline by 8%. Over the course of six months, this leads to a decline in two-parent caseloads of about 10%. The FG cases (80% of the caseload) are less affected, but terminations for these cases still increase by 4%. Entries, however, do not seem to be affected. The net result is that single-parent caseloads decline by about 2%.

With the seasonal decline in both the U and single-parent FG caseloads, the potential agricultural labor force expands by including those who are no longer on welfare, an increase that represents 2% to 3% of the agricultural labor force. This small rise in the number of available workers prevents an upward pressure on the price of agricultural labor by helping to meet the increased seasonal demand. Although this accounting, or mechanical, analysis does not take into account the possibility that those leaving welfare might enter nonagricultural employment, it does offer a sense of how welfare may be providing a seasonal addition to the agricultural labor force and sustaining this part of the workforce in the off-season.

Agricultural or rural counties account, on an annual average, for more than one-seventh of the California welfare caseload.

Policy Implications and Recommendations

Agricultural and rural counties account, on an annual average, for more than one-seventh of the California welfare caseload. Within this annual caseload, the number of welfare recipients in these two types of counties increases dramatically from the summer to the winter. Strong seasonal variation in the number of welfare cases also characterizes mixed counties, adding to the large seasonal welfare caseload variation for the state as a whole: The total California welfare caseload affected by seasonal factors doubles to well over one-fourth if mixed counties are included with agricultural and rural ones.

In summary, the seasonality of welfare use in agricultural counties can be largely explained by the seasonality of agricultural and manufacturing employment. In agricultural and mixed counties, agricultural employment is primarily responsible for this seasonality. In agricultural counties, the increased demand of about 8% for agricultural labor from winter to summer leads to a reduction in the welfare caseload that supplies 2% to 3% of the total agricultural workforce. Among rural counties, the predominant sectors vary, but primarily are agriculture, manufacturing, trade, service, and construction and mining. In some rural counties, reductions in the welfare caseload between the winter and the summer supply

a significant fraction of the workforce in these sectors.

Coping with Time Limits

The TANF legislation and the CalWORKs program emphasize work and time limits for welfare recipients. Although California's time limits do not necessarily remove an entire family from aid, they do substantially reduce the degree to which welfare can provide income for seasonal workers beyond the five-year cumulative time-limit period. There are at least four ways in which seasonal workers might cope with—or public-policy decisions address—the impact of time limits.

One possibility is that the seasonal workers will stay where they are and simply find other ways to combine summer employment with winter unemployment. This will almost certainly mean that more families will have annual incomes below the poverty level.

Another possibility is that these people might get new jobs with less seasonality or move elsewhere. This might happen for some workers, but workers often have difficulty moving from either one job to another or one location to another.[22] Furthermore, if a large number of seasonal workers do move to other areas, then employers in seasonal industries must either find their workforce elsewhere or bid up the price of the labor they need.

Still another possibility is that welfare time limits might be modified in those areas with significant seasonal or persistent unemployment. This would allow seasonal workers to combine welfare with work and probably to have enough income to lift them out of poverty. This approach, however, means that the government will be subsidizing the workforce for seasonal employers and that it will be providing incentives for workers to remain in areas with high unemployment rates. It will also extend people's involvement in a stigmatizing social-welfare program.

Still another possibility is that welfare time limits might be modified in those areas with significant seasonal or persistent unemployment.

A fourth possibility is that unemployment insurance, or some variant of it, could be extended to seasonal workers. Currently unemployment insurance is seldom available to these workers, either because their work does not fall under a covered category or because they cannot stay employed long enough to qualify for unemployment-insurance benefits. An unemployment-insurance scheme would be less stigmatizing than welfare, and it would involve employers in providing part of the subsidy for its seasonal workers through the traditional experience rating method of funding unemployment insurance. Unfortunately, many employers of seasonal labor would probably balk at the expense of such a program.

Recommendations

On the basis of our findings, we urge state and county policymakers to consider adopting the following recommendations:

Conduct a special investigation into the impact of welfare time limits in rural and agricultural areas.

Because the group we have identified spend only about half the year on welfare,

A fourth possibility is that unemployment insurance, or some variant of it, could be extended to seasonal workers.

Policymakers should consider expanding unemployment insurance to cover more agricultural jobs and to cover seasonal agricultural employment.

cumulative time limits will affect them later than those who are on welfare continuously and their responses to time limits will affect the local labor market. We recommend a special study of welfare recipients in rural and agricultural areas to determine how time limits affect them and what their responses to time limits might be.

Consider expanding unemployment insurance to cover more agricultural jobs and to cover seasonal agricultural employment.

Unemployment insurance covers only some agricultural employment, and its eligibility requirement of steady periods of employment before being eligible to apply often mean that agricultural employees cannot avail themselves of it. We recommend that state policymakers consider the feasibility of expanding unemployment insurance to cover more agricultural workers.

Consider alternative approaches to dealing with seasonal welfare use.

In conjunction with policymakers in rural and agricultural counties, state policymakers should try to identify innovative ways to help workers who currently combine welfare with seasonal work. Unlike many urban welfare recipients, for whom the challenge is to find ways to introduce them to the world of work, seasonal welfare recipients are already working every year during the summer. The challenge facing them is trying to find ways to continue working during the winter. Meeting this challenge will require a mixture of supportive services, broader access to job opportunities (perhaps in other geographical areas), and training for these new opportunities.

APPENDIX

Aggregate and Individual-Level Models Linking Welfare Use to Employment Patterns

Our aggregate and individual-level models linking welfare use to employment patterns were guided by a theory of welfare entrances and exits. Our theory considers entrances and exits from welfare to be the result of a probabilistic process among the relevant at-risk (of needing welfare) population in which different subpopulations have different chances of entering or exiting welfare. These chances depend upon employment conditions, benefit levels, and other factors that are known to affect welfare use.

Based on our theory, we developed an aggregate-level statistical model for explaining welfare entries and exits (or accessions and terminations) by examining cross-sections of the county population at monthly intervals. The model included lagged dependent variables (which enabled the estimation of the delayed impact of welfare status), current and lagged values of independent variables (such as employment in various sectors), and corrections for various statistical problems. This model showed that a substantial amount of the variation in entries and exits could be explained by the ups and downs of employment. As expected, employment had a greater effect on welfare participation for cases of families with two parents (U cases) than on cases of families with one parent (FG cases). In agricultural counties, agriculture-sector employment had a large, significant effect on both entries and exits for U cases and on exits for FG cases. In rural counties, retail employment helped explain variation in welfare exits for both FG and U cases and variation in entries for U cases. Employment in other sectors also helped explain both entries and exits for U cases in rural counties.

With the individual-level data—a 10% sample of welfare recipients in all California counties—we prepared an event-history model for terminations from welfare.[23] In our model, the probability of leaving welfare (the exit rate) is a linear function of the explanatory variables of age, county employment variables, the length of receipt of aid, calendar-month fixed effects, and county fixed effects.[24] The results from the individual-level data largely mirrored those from the aggregate-level data: A substantial amount of the variation in entries to welfare and exits from it could be explained by the ups and downs of employment. We also found that the average welfare recipient in either a rural or agricultural county had both more and shorter welfare spells than the average welfare recipient in an urban county. A person in an agricultural or rural county is therefore more likely than a person in an urban county to go on welfare in a given year; however, once on welfare, the person is more likely to exit before an urban recipient who began welfare at the same time.

NOTES

1. Bane and Ellwood (1983, 1994).

2. "Agriculture" combines farm employment with agricultural services, forestry, and fisheries employment.

3. See, for example, Bluestone and Sumrall (1977); Albert (1988); Congressional Budget Office (1993); U.S. Council of Economic Advisers (1997); Ziliak et al. (1997); Blank (1997); and Brady and Wiseman (1997).

4. See, for example, Fitzgerald (1995); Harris (1993); and Sanders (1992).

5. See, for example, Hoynes (1996).

6. See, for example, Fuguitt, Brown, and Beale (1989); MaCurdy, Mancuso, and O'Brien-Strain (2000); Lichter, Johnston, and McLaughlin (1994); Rural Policy Research Institute (1999); O'Neill, Bassi, and Wolf (1987); Rank and Hirschl (1988); Fitzgerald (1995); Porterfield (1998); Jensen, Keng, and Garasky (2000); Findeis and Jensen (1998); Tickamyer (1992); Taylor, Martin, and Fix (1997); and Hoffmann and Fortmann (1995).

7. The 14 counties classified as mixed have a combined population that is greater than the separate populations of 40 different states. Meanwhile, the combined population of the 12 counties classified as urban is about 20% larger than that of any other state, according to the 2000 census.

8. Our typology is not the only way to classify counties. The U.S. Department of Agriculture (USDA) has developed two widely used county typologies: Beale Codes and Economic Research Service (ERS) economic function types. Beale Codes classify counties along a rural-urban continuum. The economic function types of the ERS classify counties according to their major industry. Our typology combines the geographic approach of the Beale Codes with the economic approach of the ERS function types. To a very large extent, our classification system accords with the USDA's. The typologies agree where we would expect them to agree. The greatest differences between our typology and the USDA's are that ours is much less likely to classify counties as metropolitan, and has a less stringent requirement for calling a county "agricultural." (The ERS definition of a "farming-dependent" county requires that farming contribute a weighted annual average of 20% or more of total labor and proprietor income during 1987–1989 [Cook and Mizer, 1994].)

9. The percent rural figures are from the U.S. Bureau of the Census, *Census of Population and Housing, 1990* (U.S. Department of Commerce, 1992), where rural areas are defined as all areas except places of 2,500 or more population incorporated as cities, villages, and towns. The percent farm- and agricultural-services employment figures are for 1993 (U.S. Bureau of Economic Analysis).

10. The data used for this and other welfare analysis at the aggregate level are from the California Department of Social Services series *Public Welfare in California*. This series provides monthly information by county on total aid payments, number of children and people receiving aid, and number of cases, exits, and entries.

11. We combined Sutter and Yuba counties in our data set because some industry data were unavailable for each county separately until 1994. We excluded from our data set the two counties with the smallest populations, Alpine and Sierra, because a large portion of the variability in their welfare and employment rates is driven by idiosyncratic factors that are averaged out over very small populations. During the period of our data set, Alpine's population never exceeded 1,200, while Sierra's population never exceeded 3,400. The county with the third-smallest population, Mono, always had at least 8,800 people.

12. Welfare participation, or percent on aid, is calculated as the total number of people on aid divided by the population.

13. The variability numbers (coefficient of variation: standard deviation times the mean) measure the amount of variation in the percent of the population on aid in a year. They are calculated as the average across all years of the standard deviation for welfare participation within a year.

14. We defined summer months as May through October and winter months as November through April.

15. FG cases constituted, on average, more than four-fifths of the welfare caseload in each county type over the period covered by our data set. The proportion of the welfare caseload made up of U cases ranged from about one-seventh in urban counties (13.8%) to one-fifth in agricultural counties (19.6%). Compared to other states, California's caseload contains a disproportionate share of two-parent families. Only 7% of the national caseload consisted of these families in 1996, but more than half (54%) were in California (U.S. House of Representatives, *Green Book*, 1998). Within both the FG and U welfare subprograms, some cases are child-only cases, cases in which adults (usually parents) are excluded from the household size calculation used to determine welfare benefits. In our analysis these cases are not distinguished from cases with aided parents, because we believe adults associated with both types of cases face similar economic incentives.

16. California Employment Development Department (2000).

17. The industry data are collected by the California Employment Development Department (2000). These monthly, county-level data are for industries classified by the Standard Industrial Classification (SIC) code.

18. For each county type, employment is averaged across all counties of that type for each month, and the difference is taken between the highest summer month and the lowest winter month.

19. Brady et al. (2000).

20. California Work Pays Demonstration Project (1997).

21. A more technical treatment of how these estimates were obtained can be found in Brady et al. (2000).

22. President's Council of Economic Advisers (1990).

23. California Work Pays Demonstration Project (1997).

24. *Calendar-month fixed effects* represent all those factors that affect the receipt of welfare and that are the same for each county but may vary from one month to the next. For example, the overall performance of the economy might affect all counties equally but vary from month to month. *County fixed effects* represent all those factors that affect the receipt of welfare and that remain the same for each county over time. For example, the administrative practices of the county welfare department might remain fixed over time but vary from county to county.

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