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UNIQUENESS OF AGRICULTURAL LABOR MARKETS

DENNIS U. FISHER AND RONALD D. KNUTSON

Virtually all sizes and types of farms employ farm labor. During the past decade (1999–2009), approximately half of the farm labor force has been made up of unauthorized workers (Hertz 2011). The preponderance of unauthorized workers in the farm labor force has made immigration policy a major issue for agriculture (Senate Judiciary Committee 2011). The focal points of these policy discussions include the extent to which farmers experience labor shortages and the need to streamline the H-2A guest worker program.

From a national perspective, it is commonly thought that a farm labor shortage does not exist. For example, Levine (2009 p.13) concludes that, “In summary, indicators of supply-demand conditions generally are inconsistent with the existence of a nationwide shortage of domestically available farm workers in part because the measures include both authorized and unauthorized employment.”

And yet, during harvest season for fruits and vegetables, there are reports of labor shortages, which are often dismissed as being anecdotal or politically motivated (Horner 2011).

The purpose of this paper is to analyze the unique aspects of farm labor markets that make labor shortages possible in the face of high levels of unemployment, and what appears to be a persistent flow of undocumented workers, largely from Mexico, into the United States. The paper hypothesizes that the hired farm labor workforce comprises at

least three distinctly different subsectors composed of a mix of seasonal workers and non-seasonal (annual) workers. These segments include: (1) fruit and vegetable workers; (2) workers employed on field crop farms; and (3) workers employed in animal agriculture. We further hypothesize that farm labor markets are local, not regional or national. Responsible analysis of how changes in immigration policy will impact stakeholders (workers and their communities, farmers, American citizens, and consumers) will require the use of correct definitions of farm labor markets.

U.S. Farm Workers

It is commonly reported that the national farm labor force is made up of approximately 1.1 million workers, which has been relatively stable for at least the past decade (1999–2009) (Kandel 2008; Hertz 2011). This conclusion is based on the authors averaging National Agricultural Statistics Service (NASS) data collected from employers on the number of farm workers during one week in January, April, July, and October. Therefore, the data do not reflect all individuals who did farm work during each year. The data indicates substantial period-to-period seasonal variability (figure 1). For example, the total number of workers ranged from 802,000 in January 2010 to 1,245,000 in July 2010. Obviously, these national data do not reveal the more extreme seasonal hiring fluctuations that occur in local markets.

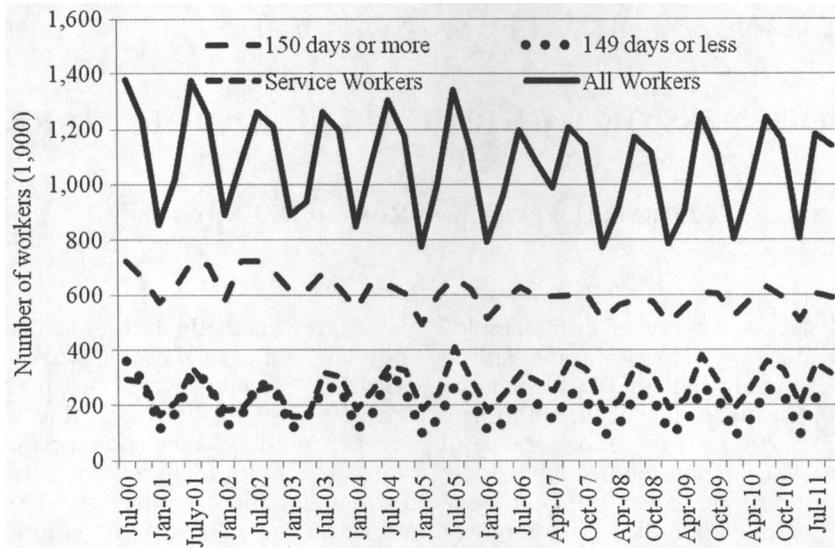
Figure 1 indicates a slight declining trend in the total number of workers employed. Most of this downward trend was accounted for by workers employed for more than 150 days. The number of agriculture service workers experienced a slight upward trend. Agriculture service workers are paid by the

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Source: USDA, National Agricultural Statistical Service, *Farm Labor*, various issues

Figure 1. Trends in number of farm workers employed during one week in each of four months (January, April, July, and October), 2000–2011

work crew leader or contractor who contracts with individual farmers for whom specified farm labor services are performed. Agriculture service workers are also referred to as contract workers.

The 2007 Census of Agriculture provides useful data on the distribution of farm labor expenses across states. Most of the leading farm labor expense counties are in California, with a few in Washington and Arizona, two in Florida, one in Pennsylvania, and one in Oregon. These counties accounted for 25% of the total U.S. farm labor bill in 2007. The counties accounting for the next 25% of the total U.S. farm labor bill are found in the states mentioned above, and in states distributed across the United States all the way to the East Coast.

Contract labor expense is concentrated in a few U.S. counties. All leading counties accounting for 25% of the U.S. contract labor expense are located in California. Counties accounting for the next 25% of the U.S. contract labor bill are found in California and Florida. Farms employing 10 or more workers for both more or less than 150 days were concentrated in California, and to a lesser extent in Washington and Florida.

Farm labor expenses accounted for over 40% of the cash farm production expense for farmers in 35 U.S. counties (NASS 2007). As anticipated, many of these counties were

located in California, Florida, Washington, and Oregon. However, some unanticipated counties were in Massachusetts, North Carolina, Hawaii, New Jersey, Ohio, Illinois, Louisiana, and Alaska. The common feature of these unanticipated counties may be the importance of nursery, floriculture, and greenhouse production. One can anticipate that for farmers in these counties, the availability and procurement of farm labor is an important management concern.

Estimates indicate that the share of unauthorized crop workers peaked at about 55% from 1999-2001, and has since fluctuated around 50% (Kandel 2008; Hertz 2011). However, this estimate is believed to be low, which should be expected due to the potential legal implications of employing unauthorized workers (Martin 2011). With about 70% of the farm workers being natives of Mexico (Hertz 2011), it can be assumed that most of these unauthorized workers crossed the border from Mexico. The high percentage of unauthorized workers is attributable to: the relative ease of crossing the border; the demand for workers who are willing to perform back-breaking farm labor; the lack of employment opportunities in their native country; and the relative unwillingness of domestic workers to perform these functions (Knutson and Fisher 2011).

It is a common misconception that most hired farm workers are migratory. Carroll, Saltz, and Gabbard (2009) estimated that from 2007–2009, 67% of the crop workers were settled, meaning that they work at a single location within 75 miles of their home. Hertz (2011) indicates that by 2009, three-fourths of the crop workers were settled. The share of settled workers employed in animal agriculture would be expected to be much higher than the 75% estimated by Hertz (2011) for crop workers, meaning that less than 25% of farm workers are migratory.

In conclusion the predominately settled nature of farm workers is more consistent with multiple smaller labor markets than with a single national labor market or large regional markets, and also has important implications for immigration policy. The longer workers live in one location, the greater is their tendency to become part of the general population. Correspondingly, the greater is the pain and disruption that would be caused by an immigration policy that would send them back to their respective homelands. It is possible that unauthorized workers constitute a major share of the population in some communities.

Characteristics of Agricultural Enterprises

The mix of farm enterprises differs significantly across the United States, and each enterprise requires a unique mix of farm workers. Fortunately, the Agricultural Resource Management Survey (ERS 2011) provides data on the labor use characteristics of farm specialization of whole farms. In 2009 the survey included a very useful breakdown of hours worked by enterprise, and was separated by the operator, operator's spouse, and hired farm workers. ARMS data averaged for 2009 and 2010 was used to analyze farm labor costs and hours used by high-value crops, field crops, and animal agriculture (figure 2).

High-value Crops

High-value crops include vegetables, fruits and tree nuts, and nursery and greenhouse products. High-value crops are concentrated in California (40.3% of U.S. 2007 sales) and Florida (11.4%), Washington (6.4%), and Oregon (3.7%); altogether these states contributed 61.8% to total U.S. 2007 sales.

In 2009–2010, 156,333 high-value crop farms accounted for 7% of U.S. farms, used 52%

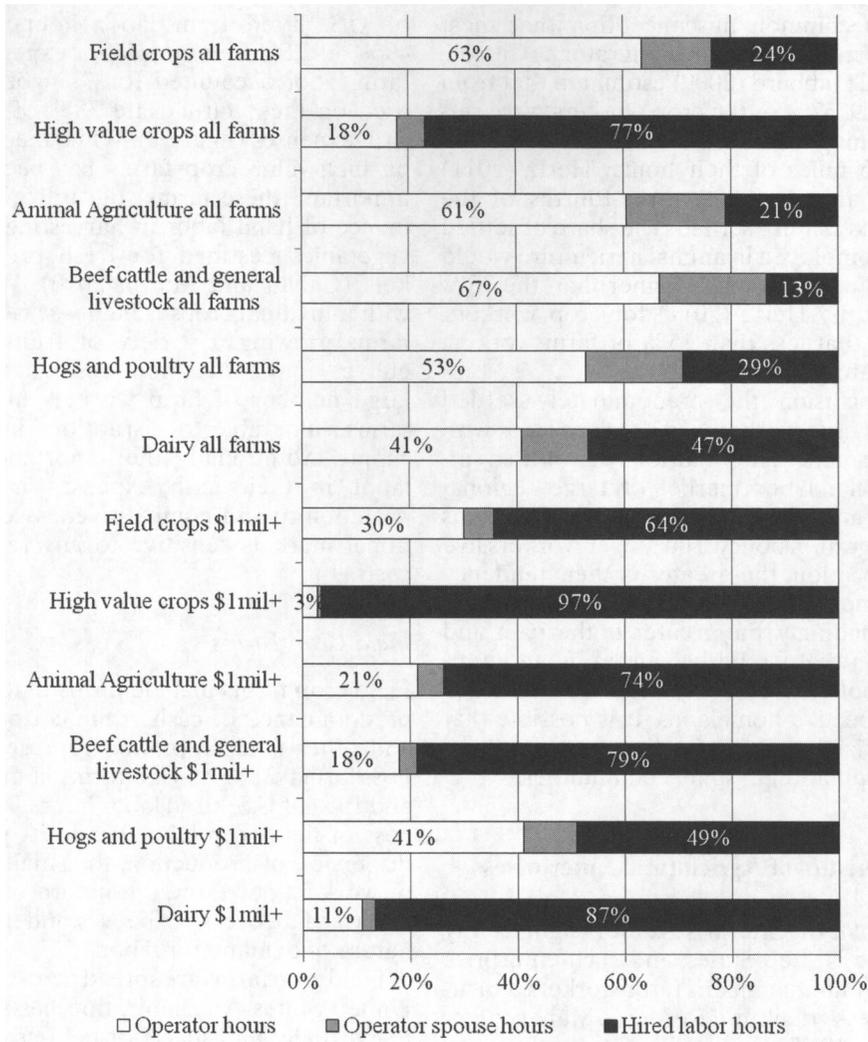
of U.S. hired farm labor hours, and paid 49% of U.S. hired farm labor expenses. Hired farm labor accounted for 77% of the hours used on these farms, and 38% of the farms' cash expenses (figure 2). While mechanization on high-value crop farms has become more important, these farms still utilize a predominance of hand labor in harvesting fruits and vegetables destined for fresh produce markets (Calvin and Martin 2010). While work with individual crops is highly seasonal, larger farms growing a variety of fruits and vegetables may offer non-seasonal work. The large number of farm workers makes these farms vulnerable to disruptions in the labor supply. Additionally, the importance of farm labor in their cash expenses makes their profitability and competitiveness on international markets sensitive to any rise in labor costs.

Field Crop Farms

Field crop farms include farms that produce a predominance of cash grain, cotton, oilseeds, and other field crops, and represent 38% of U.S. farms, 21% of U.S. farm labor expenses, and 19% of U.S. hired labor hours. The uniqueness of field crop labor lies in its geographic dispersion of production, the smaller number of workers per farm, the nature of the work, labor's share of cash expenses, and the seasonal nature of demand for labor.

Field crop farms are spread across the central United States. Mechanization has substituted for virtually all aspects of field crop farming, including the once back-breaking jobs of making hay and picking cotton. For hired farm labor, operating farm equipment requires substantial experience and training. Mechanization, custom services, and a relatively large number of small farms explain why operator labor accounts for 63% of the U.S. labor hours utilized by field crop farms. Hired farm labor averages 7% of these farms' cash expenses compared to 38% for high-value crop farms. On aggregate, field crop farms account for 19% of U.S. hired farm labor hours, and 21% of U.S. cash expenses on hired labor compared to 52% and 49%, respectively, for high-value crop farms.

Given the nature of production and harvesting, most field crop labor is employed on a seasonal basis, and many jobs require substantial skill. A majority of these workers are believed to have been born in the United States (Carroll, Saltz, and Gabbard 2009).



Source: 2009-2010 USDA Agricultural Resource Management Survey. Data extracted by Bob Dubman, USDAERS.

Figure 2. Hours worked by farm enterprise and labor source

Animal Agriculture

Animal agriculture is highly diverse and geographically distributed throughout the United States. Animal enterprises account for 55% of all U.S. farms, 30% of U.S. farm labor expenses, and 29% of U.S. hired farm labor hours. Hired farm labor expenses account for 9% of animal agriculture farms’ cash expenses. Therefore, the profitability of animal agriculture farms is less sensitive to increases in labor costs than that of high value crop farms. The labor characteristics have some similarities to field crops. The operator is the major contributor to the labor force. Most jobs are

non-seasonal, so most farmers in this category do not have access to the H2-A guest worker program.

When animal agriculture is broken down into three subsectors, the unique aspects of each become evident. These subsectors include beef and general livestock; hogs and poultry; and dairy. With the exception of large beef feedlots, beef and general livestock are widely dispersed geographically, with many small farms and a small number of large ranches. In 2009-2010, the beef and general livestock subsector included 1.1 million farms representing 49% of all U.S. farms, 12% of all U.S. hired farm labor expenses, and 13% of

all hired farm labor hours. Most of the labor was provided by the operator and spouse on all but the largest feedlots and ranches. Therefore, hired farm labor accounted for 7% of these farms' cash production expenses (ERS 2011).

Hogs and poultry have become predominantly contract integrated on 77,000 farms. In 2008, contracts covered 90% of poultry production and 68% of hog production (MacDonald and Korb 2011). In addition, production tends to be concentrated geographically in the Corn Belt, Arkansas, and the Eastern Seaboard states. The operator and spouse supplied 71% of the labor, which left 29% as hired farm labor. When combined with high feed costs, labor expenses were only 10% of total cash expenses. These farms accounted for 4% of all U.S. farms, 5% of U.S. farm labor expense, and 4% of U.S. hired labor hours.

Aside from high value crops, the dairy subsector is the most labor-intensive of the enterprises studied; it represents 2% of all U.S. farms, but accounts for 12% of all U.S. hired farm labor hours and labor expenses. Cows must be milked twice or three times a day, seven days a week, and 365 days annually. While the dairy farm operator and spouse made the largest labor contribution to these operations, 47% of the labor hours were hired, and accounted for 13% of their cash expenses. Many of the jobs on dairy farms require substantial training and experience. Therefore, dairy farms are more susceptible to disruptions in the labor supply than to rising labor costs.

Farms with \$1 Million-plus Sales

Farms with \$1 million or more in sales reveal a significant shift toward hired labor and away from operator and spousal labor. Hired labor for beef and general livestock increased from 13% for all farms to 74% for farms having \$1 million-plus sales. The corresponding values for dairy were 47% to 87%: for field crops 24% to 64%; for high-value crops 77% to 97%; and for hogs and poultry 29% to 49%. Despite the increased dependence on hired farm workers, hired farm labor expenses as a percentage of total cash expenses increased by less than 2 percentage points across all enterprises.

These larger farms are more dependent upon a large number of farm workers than their smaller counterparts, but their profitability is only slightly more vulnerable to the cost of labor. Larger farms may be better equipped to offer employment packages and to compete for available workers. However, their larger

size may make them more susceptible to a disruption in the labor supply.

Farm Labor Markets and Labor Shortages

The unique nature of the various agricultural enterprises implies that labor supply and demand conditions differ significantly. Also, the county-by-county differences in the density and characteristics of labor utilization suggest that hired farm labor supply and demand conditions differ substantially in California's farm labor-intensive counties from those in many other states. Labor supply and demand conditions have critical time and place dimensions dictated, for example, by weather conditions. Labor shortages occur when insufficient farm workers are available to harvest a farmer's crop when it is ready. From the workers' and the farmers' perspectives, labor surpluses and shortages are local and not determined by looking at national unemployment rates.

Some analysts find it difficult to rationalize the existence of shortages of hired farm labor with unemployment rates that have exceed 8% for extended time periods (Levine 2009; Knutson and Fisher 2011). This may occur because of: insufficient attention to the local nature of labor markets; the skills required; the willingness of the domestic labor supply to perform farm labor; the workers from outside the local supply area may not be available. The availability of unemployment compensation for an extended time period removes the incentive for some workers to seek farm employment. Others may not be able to do physically demanding farm work. Unemployed farm workers in an area of labor surplus may not find it financially feasible to relocate their family to areas of labor shortage. While some farm labor jobs require specialized skills, almost all are physically demanding and must be performed in a difficult environment. Considering these unique conditions, analysts must delineate the dimensions of farm labor markets to analyze the impacts of policy changes on stakeholders, starting with workers, farmers, and communities.

Many economic disciplines have given considerable attention to defining markets. Industrial organization economists must define markets to evaluate the extent of competition and/or the existence of monopoly power (Handy and Stafford 1981; Marion 1985; Vukina and Leegomonchai 2006; Key and MacDonald 2008). A good entry point to the

market-defining literature is Reilly's (1931) development of the law of retail gravitation, in which he posits an economic model for determining the limits or breaking points between shopping areas based upon the willingness of consumers to travel. Kaplow and Shapiro (2007) examine the pattern of imports and exports across ever-expanding boundaries to determine the point(s) at which consumers are no longer attracted to a center of economic activity. Like the work of Riley, this model and its derivatives, explained by Kaplow and Shapiro, can be applied to imports of labor into an economic center of employment activity. Defining a labor market should consider: the geographic market area governed by where workers come from and where they work; skill levels of jobs and workers; availability of migrant workers who are willing and able to travel, and; the availability of worker housing.

Buccola, Li, and Reimer (2011) made an important contribution to labor market analysis by systematically studying the supply of labor to Oregon nurseries, including the sensitivity to wage rates, the minimum wage, and Mexico border apprehensions as a proxy for border crossings. However, utilizing state boundaries as a proxy for a labor market is not a substitute for careful *ex ante* market definition.

National and/or state-wide analysis is useful for examining the movement of workers into or out of farm work and interactions with rural employment. It is not as useful, however, for analyzing labor shortages and/or surpluses that occur in local markets where conditions are likely to be quite different. The larger area analysis does not identify where local labor surpluses or shortages will occur, or the time required for farmers and workers to respond to local market conditions.

Farmers' preferences would be for authorized workers obtained through a functioning guest worker program. The current H-2A program does not fit this requirement because of delays in obtaining H-2A authorization (Knutson and Fisher 2011). The practical issues related to labor shortages were best illustrated by the testimony of Horner (2011), a Georgia blueberry grower who found that 90% of the 67 workers hired over the course of a year were unauthorized. Horner testified to making a decision to apply for H-2A approval to hire approved workers. After following the prescribed advertising procedures, only 13 workers accepted jobs, 6 worked for 3 days or less, 2 worked for more than 2 weeks, and none finished the harvesting season. The lessons from

the experience of Horner (2011) and analysts such as Rosson (2012) include: the supply of authorized workers who were willing and able to work was not available; the H-2A program could not deliver the needed workers despite high levels of unemployment, and; unauthorized worker employment was essential to avoiding local labor shortages. Under these circumstances, the application of an E-verify requirement would complicate the labor shortage issue. This was apparent when the Georgia legislature threatened to impose an e-verify requirement on farm workers (McKissick and Kane 2011; Horner 2011).

Local labor market conditions are critical to both farmers and workers. Workers require enough work to supply necessary income, and farmers need enough workers at the right time and place to harvest their crops. A surplus of labor is costly to workers, and a shortage of workers is costly to farmers. In any year, shortages and surpluses will occur in local areas. From the workers' and farmers' perspectives, surpluses and shortages are local and always costly.

Conclusions and Implication for Research Strategy and Data Collection

Studies analyzing national data have concluded that there is little evidence of a national farm labor shortage (Levine 2009; Martin 2007). Many assume that given the high rate of unemployment, local workers will step up to fill farm jobs. At the same time, equally credible farmers and researchers have confirmed that labor shortages exist and become acute and costly when the labor supply is disrupted (Horner 2011; Rosson 2012). How are these diametrically opposed views possible? First, there is a belief that farm labor is mobile across the United States. Therefore, it is believed that the farm labor market is national and that any shortages will be rectified if higher wages are offered. Second, most data are available on a national basis, and little information is available from secondary sources for examining the local nature of farm labor markets.

Our analysis indicates that the labor shortage issue is much more complex than previously thought. We have demonstrated that each of the agricultural enterprise subsectors has different labor requirements. Also, local markets have unique supply and demand conditions and relationships due to a wide range of conditions, including biological, weather,

required skills, and labor mobility. New data and research must focus on farm labor markets as they exist, not as the currently available data directs. An accurate view of farm labor markets is essential to creating immigration policy options and evaluating their consequences.

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