Farm Size and Community Quality: Arvin and Dinuba Revisited

Michael N. Hayes and Alan L. Olmstead

A comparative analysis of Arvin and Dinuba, California, suggests that many factors besides differences in farm size contributed to Arvin's retarded community development. Rather than being closely matched communities, the two towns had developed within significantly different economic, demographic, and geographic settings. Goldschmidt's hypothesis that large farms accounted for differences in community quality may still be correct; but, because of methodological flaws, his study of Arvin and Dinuba offers little support for this assertion.

Key words: agricultural history, community development, farm size.

Controversy about the economic efficiency and the negative social ramifications of large farms has been a continuing theme in agricultural economics. The single most important work describing the deleterious effects of large farms on community development is Goldschmidt's seminal contribution, Small Business and the Community. Published in 1946 by the Senate Special Committee to Study Problems of American Small Business, this work is known to many as the Arvin-Dinuba Study.\(^1\) Its objective was "to ascertain the economic and social effects of size of farm enterprise upon the social life of the community and certain social attitudes of its population" (USDA "Records of Walter R. Goldschmidt," 83/290/66). Reviewing data for 1940 compiled by the Agricultural Adjustment Administration for twenty-five rural communities in Madera, Kern, and Tulare counties in California, Goldschmidt selected Arvin (Kern) and Dinuba (Tulare). The two towns' underlying demographic, economic, and geographic characteristics supposedly were similar, except that the average farm size differed significantly. Average farm size around Arvin was 497 acres; around Dinuba it was 57 acres.\(^2\) The study's principal conclusion was that the "quality of social conditions is [negatively] associated with scale of operations; that farm size is in fact an important causal factor in the creation of such differences, and that it is reasonable to believe that farm size is the most important cause of these differences" (Goldschmidt 1946, p. 114).

From its inception, Goldschmidt's work has been the focus of political and academic controversy. It caused a furor as many California newspapers, farm organizations, and politicians attacked both Goldschmidt and his findings. Representative Albert Elliott and Senator Sheridan Downey repeatedly attacked the report in Congress, and Downey wrote a book arguing that the towns were totally unsuitable for comparison because Arvin had not yet had time to develop (Kirkendall 1964, p. 209). The ensuing exchange of vitriolic personal attacks did little to clarify the issues.\(^3\)

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1 The study has recently been republished as part of a larger volume (Goldschmidt 1978).

2 Goldschmidt never defines the boundaries of either study area, and thus how he generated farm sizes of 497 and 57 acres is not clear. No a priori basis exists for defining the Arvin area; relatively minor boundary adjustments result in enormous changes in the average farm size (USDA, BAE, 83/199, 83/290/66, Department of Water Resources). This analysis uses the average farm sizes and study area sizes most commonly cited by Goldschmidt.

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In the academic arena, scholars from several disciplines have praised the Arvin-Dinuba study. Gates has characterized Goldschmidt’s study as a “classic” and accepted its conclusion without reservation (p. 178). LeVeen and Stavins described the study as the most important to date on the effects of industrial and family farming on rural community development (p. 52). A chorus of rural sociologists have echoed this sentiment, and studies of farm structure commonly begin with at least a perfunctory reference to Goldschmidt’s pioneering work (Small Farm Viability Project; Nuckton, Rochin, and Gwynne; Carter et al.). Goldschmidt, in 1972 testimony before the Senate Subcommittee on Monopoly, stated that in twenty-six years of scrutiny, “Nobody [has] pointed to inaccuracies in the data, to failures of analysis, or to the evidence that I was said to disregard” (1972, p. 3321). In a more recent evaluation, Goldschmidt wrote that agribusiness interests “deprived the study of the opportunity for rational examination; they changed the arena of discourse from one of judicious review of the facts...to one of propaganda involving diverse irrelevancies” (Kirkendall 1979, p. 504).

Indeed, much of the criticism leveled at Goldschmidt’s work has not focused on the facts or his use of them. However, the same charges can be leveled at many of those who have cited the study favorably. After almost forty years of controversy, Goldschmidt’s work has not received the “rational examination” he requested. The purpose of this paper is to provide that examination and determine whether or not Goldschmidt’s data and method support his conclusions.

First, the paper examines the five “fundamental criteria” Goldschmidt used to compare the two communities. The conclusions are that the two study areas were not sufficiently alike to support Goldschmidt’s own standards for comparative analysis. His thesis that large farms spawn undesirable towns may be correct; but, because of methodological flaws, the study offers little support for this view. Numerous other factors than farm size might have accounted for the observed social differences. Next, the paper considers why the two areas differ in farm size and argues that distinctive local conditions provided strong economic incentives for the growth of larger farms around Arvin. This finding has important implications for Goldschmidt’s conclusions.

Comparative Standards

Goldschmidt established five “fundamental criteria” for the selection of Arvin and Dinuba. They are

“that the two communities
“(1) be sufficiently similar in size so that they could be expected to support similar institutions;
“(2) have similar and, if possible, reasonably diverse agriculture;
“(3) have existed for enough years to allow time for the development of social institutions;
“(4) not be confused with extraneous advantages, such as mineral deposits; and, of course,
“(5) that the farm size be significantly divergent.”
(Goldschmidt 1946, pp. 9–10.)

Thus, a comparison of Arvin and Dinuba should show that they were similar in age and size, supported a similar agricultural mix, and were blessed with similar mineral and physical endowments. These are the control variables which in Goldschmidt’s model are sufficiently alike to allow differences in community quality to be attributed solely to differences in farm size. However, an examination of these variables raises serious problems.

Community Size

The 1940 census shows that 4,042 people lived in the unincorporated “town” of Arvin and that 3,790 people resided in Dinuba. However, the total census area labelled “Arvin” had 4,673 people, while the census area for Dinuba had 7,667 people (Goldschmidt 1946, p. 12). With a 1940 population 1.6 times that of Arvin, it is not surprising that Dinuba supported a greater variety and higher quality of social institutions. By 1944, when Goldschmidt made his own estimates of the two populations using a survey distributed to every tenth household, noticeable demographic changes apparently had taken place in Arvin. He reports 6,236 people in Arvin and 7,404 in Dinuba (1946, p. 37). About one-half of the Arvin respondents to Goldschmidt’s survey had arrived in the community after 1940, and the region’s population had increased by 33% in four years. By contrast, there had been little turnover in the Dinuba population which, by Goldschmidt’s account, had declined by 263 (1946, pp. 12, 37). Given that much of Arvin’s population increase came during the war years when building materials were scarce, one would expect that the town’s physical development might lag behind its population growth.
Goldschmidt’s own observations support this view. In a letter to Marion Clawson (28 April 1944), Goldschmidt noted that “the expansion has been very great [in the Arvin area] in the last two years, and wartime restrictions have prevented similar expansion in community life” (USDA, “Records,” 83/287/48).

Agricultural Base

In 1940, the Arvin area produced $2.44 million of agricultural output on 41,771 acres, while the Dinuba area produced $2.54 million of commodities on 28,152 acres (Goldschmidt 1946, pp. 25–27). The 1940 output value per productive acre in Arvin ($58.41) was only two-thirds of the value in Dinuba ($90.22). Arvin’s lower figure reflects a less intensive crop mix. If the differences in crop mix and per acre output value came primarily from farm size, one might assert that the potential agricultural bases were similar. However, this is a dubious assertion if other factors, such as geography or water costs, accounted for per acre revenue differences. This issue is examined later in the paper.

Community Age

Dinuba was formally incorporated in 1906, but Goldschmidt dated its existence from the first settlement in 1888. On the other hand, Arvin was not incorporated until 1969; Goldschmidt placed its origin between 1910 and 1914, referring to the arrival of a small colony of grain farmers. Almost all of the community developments in Dinuba listed by Goldschmidt occurred before 1915; similar institutions in Arvin began to develop in the late 1930s (Goldschmidt 1946, p. 100).

Goldschmidt fails to note that Dinuba’s early development was tied to the promotional schemes of the Southern Pacific Railroad. When the Southern Pacific built its second trunk line through the valley in the 1880s, it spaced depots at uniform intervals. The railroad then transferred the land around these stations to the Pacific Improvement Company, a subsidiary designed to encourage community development. This firm platted towns centering on the stations and actively promoted immigration. Dinuba was the first of these planned communities (Preston, pp. 146–47). There was no comparable railroad sponsorship for Arvin. From its start as a depot, Dinuba had far better transport facilities than Arvin. Dinuba was a main line regular passenger stop until the early 1940s. During its formative years, as many as seven passenger trains a day stopped there (Southern Pacific Company). By contrast, Arvin was on a spur line that did not carry passengers.

Arvin’s later community growth reflected, in part, the later economic development of the surrounding countryside. The area of improved land around Arvin mushroomed in the late 1930s and 1940s, with irrigated acreage more than doubling between 1936 and 1941 (USDA, “Maps,” 83/199). Goldschmidt observed that about 17,000 acres of Arvin area land came into “intensive production” between 1937 and 1943. One conclusion is inescapable: Arvin’s economic base was booming in the years immediately preceding the time of Goldschmidt’s study. By comparison, Dinuba’s productive acreage was relatively stable. According to Goldschmidt, all of the “good lands” in the area had gone into intensive cultivation well before 1944, thereby precluding any expansion (1946, p. 24). Once again, there were striking differences (in addition to farm size) between the two communities that were highly unfavorable to Arvin’s social development.

Nonagricultural Production

On this issue Goldschmidt notes:

Arvin lies just south of fairly extensive oil fields and there is sufficient likelihood of finding underlying strata of oil to induce oil companies to maintain mineral rights on Arvin lands. Most landowners in the community have lease contracts which pay $5 per acre per year. Dinuba has no comparable source of revenue. Oil production does not materially affect the character of the community, however, since very few persons secure their livelihood from this resource, either as laborers in the oil fields or as a result of oil pumping. There are but two or three small productive wells within the community. (Goldschmidt, 1946, p. 13.)

When Goldschmidt says the community had only two or three wells, he evidently refers only to the wells nestled along Arvin’s main streets, not to those pumping within the boundaries of his larger study area. In fact, Arvin was near the center of a boom oil-bearing region located just west of its main business district boundary. This field’s fifteen wells produced 653,142 barrels of crude oil in 1940. Immediately north of the Arvin community were the lucrative Mountain View and Edison...
oils which together produced 3,288,730 barrels of crude in 1940 (Kasline; California Department of Natural Resources). The Dinuba area had no known petroleum reserves.

The Arvin study area contained about 63,520 acres (about 100 square miles). If, for purposes of illustration, this area is visualized as a circle centered in downtown Arvin, with a radius of approximately 5.6 miles, it would include all of the Arvin oil field and roughly 50% of the Mountain View field. In 1940 the wells within this area yielded over 1.8 million barrels of crude with a wellhead value in excess of $1.5 million (Department Natural Resources, p. 25). This amounted to about one-half of the gross value of Arvin's agricultural output in 1940.

The questions remain whether or not oil production near Arvin represented an important income source for many landowners and whether or not oil income affected the Arvin community. Goldschmidt concluded that "potential and actual oil deposits give an economic advantage to Arvin over Dinuba, but this is not of sufficient importance to account for any great divergence between the two towns" (1946, pp. 20–21). This conclusion is at variance with his own evidence. If Goldschmidt is correct that "most farmers" received $5 an acre per annum for mineral leases, a farmer with 497 acres might have realized as much as $2,485 a year. This is roughly two-thirds of the net agricultural income of the median farm operator in 1943. In fact, Goldschmidt's archival records hint that oil-lease income was far more important than indicated in his monograph. For example, in one case his notes suggest that oil leases saved a farm family from insolvency, and elsewhere he recorded that "some population is supported by this industrial development..." (USDA, "Records of Walter R. Goldschmidt," 83/290/66; "Records," 83/287/48).

Although most oil income probably flowed out of the Arvin area to oil company employees and stockholders, the residual going to local farmers was important. On balance, the existence of oil should have increased Arvin's tax base and injected added purchasing power into the local economy. Moreover, the presence of oil deposits also may have affected landholding and farming patterns. Even the expectation of oil deposits would have encouraged land speculation and discouraged the subdivision of farms. Analysis of Goldschmidt's first three comparative criteria suggests revisions that are detrimental to his argument, but the existence of oil in Arvin has an uncertain effect—the added income should have aided development; the more nebulous effects on land speculation, however, might have been detrimental.

Why Large Farms?

Arvin and Dinuba were too dissimilar to warrant the type of comparative analysis that Goldschmidt attempted. Other factors besides large farms contributed to Arvin's retarded social development. Nevertheless, Arvin might have been a far nicer and more prosperous community if it had been surrounded by Dinuba-size family farms. If, at an earlier date, Arvin somehow had developed Dinuba-size farms, would it also have developed into a Dinuba-type community? To address this issue, one must ask why larger farms emerged in the Arvin area and, in particular, if the larger average farm size was itself a function of important economic variables. If so, then a policy to encourage small farms could impose real economic costs on individual farmers and on the community. Finally, if such costs to small farms existed, a crude estimate of their magnitude would be useful.

Economies of Scale in Water Delivery

Differences in water cost played a key role in shaping the different styles of agriculture that emerged in the Arvin and Dinuba areas. Water was more expensive around Arvin. Nearly all of the area's irrigation water came from wells that were infrequently recharged. Pumping lifts in 1938 ranged from 60 to 450 feet and were increasing several feet per year as the water table dropped because of continual overdrafting (California Department of Public Works, Etcheverry, Pacific Gas and Electric Co.).

By way of contrast, Dinuba had a more abundant surface water supply. The Alta Irrigation District (formed in 1888), which serviced the entire study area, held riparian rights to Kings River water. Roughly one-third of the Dinuba area's irrigation water came from the Kings River. The other two-thirds came from pumping, but because of a regular recharge program conducted in the off-season, lifts were relatively shallow and the water table was fairly stable over time.
Goldschmidt recognized these obvious differences and expended considerable effort analyzing their significance. To this end, he collected data on well depth, drilling and pumping costs, pump efficiency, water table levels, and many other variables in order to estimate the cost of irrigation in 1940. Goldschmidt’s estimates for Dinuba are reasonably accurate, but he significantly understated Arvin’s average water cost. A look at two key variables, well depth and lift, illustrates the point.

Goldschmidt assumed a well depth of 500 feet and a lift of 182 feet in Arvin. He reportedly derived both figures from an eight-well sample found in a 1933 study by Monett. To obtain a lift estimate for 1940, Goldschmidt adjusted Monett’s figure by 3 feet a year (1946, p. 126). Records on 80 Arvin area wells drilled 1926–46 show a mean depth of 748 feet, about 250 feet deeper than Goldschmidt assumed (California Department of Water Resources). For lifts, a 27-well sample in the Arvin area tested by the Pacific Gas and Electric Company in 1945 shows a mean pumping lift of 278 feet. Given that lifts were increasing by about 5 feet a year in this period, average lift was about 253 feet in 1940. These two revisions significantly affect Arvin area irrigation water cost estimates. Goldschmidt estimated the average cost per acre-foot at $2.37 for a representative Arvin farm (497 acres); this study’s figures suggest it was closer to $5.25. By comparison, Goldschmidt estimated that a representative Dinuba farm (57 acres) paid an average of $1.59 per acre-foot for water (pp. 21, 128).

Goldschmidt recognized that the higher water costs in Arvin inhibited the growth of small farming in part because of the economies-of-scale in well drilling and pumping. But he discounted the significance of this point by stating that “the cost of water is an item which is reflected in the value of the land, since land values are based upon the capitalized potential net income” (1946, p. 22). According to this reasoning, the relatively high Arvin area water costs were offset by lower land values. This observation does not imply that similar farming styles should have developed in the two areas; it simply means that, at the margin, the rates of return to farming in each area should have been similar after allowing for other adjustments. Other things equal, cheaper land should be associated with larger farms. Furthermore, farmers in the Arvin region should adopt a different, less water-intensive crop mix than Dinuba growers. Thus, an argument designed to diminish the significance of differences in water costs in fact goes a long way toward explaining why both larger farms and a different crop mix should have emerged around Arvin for economic reasons.

More relevant to the problems raised by Goldschmidt’s work is the question of the economies of scale in supplying water within the Arvin area. For example, if 57-acre farms were hypothetically imposed in Arvin, how prosperous would they have been? Could they in fact have supported a community with amenities similar to Dinuba, as Goldschmidt implies? Goldschmidt’s own findings suggest that this would have been highly unlikely because of the considerable fixed costs of deep wells and the greater efficiency of large pumps. His estimates show a 57-acre Arvin farmer paying $14.19 for the water needed to irrigate an acre of land compared to an average of $6.92 per acre for a 497-acre farm (1946, pp. 21, 128). This difference in excess of $7.00 an acre represented a considerable “cost to smallness.” For a 57-acre farm it would have amounted to approximately $414 in higher costs than if that acreage had been farmed as part of a larger unit. The revised water cost estimates in this paper, based on a far larger and more diverse sample of wells, suggest an annual cost of irrigation around $30 per acre for a 57-acre farm compared to about $16 an acre for a large farm. Thus, a small farmer might have paid as much as $798 a year more than a competing large farmer for the water required to irrigate 57 acres of cropland. That amounts to more than one-fourth of the median net income in 1943 for a Dinuba area farm operator (1946, p. 46).

Employing Goldschmidt’s own method and data suggests that the owner of a small farm, with representative Arvin water costs, would have had a strong financial incentive to expand his acreage or rent to a larger operator. With the revised cost estimates, a stronger incentive for consolidation exists. Goldschmidt’s archival records clearly show that the majority of small farmers did consolidate; almost

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3 Conversations with Pacific Gas and Electric Co. officials indicate that these data are probably biased because irrigators tended to test problem wells which were too shallow. If so, the sample understates the actual average pumping lift in the area.
60% of the land owned in parcels of 80 acres or less was farmed as a portion of a larger operating unit (USDA, "Records of Walter R. Goldschmidt," 83/290/66). This pattern was far less evident in Dinuba.

Broader Trends in California Agriculture

The timing of agricultural development around the two communities also influenced farm size. During the period of Dinuba’s growth, there was a rapid expansion in orchards and vineyards throughout the state; the general trend was toward planting field crops by the early 1920s. As an example, the San Joaquin Valley had about 130,000 acres of nonbearing vineyards in 1923 and only about 20,000 in 1935 (Johnston and Dean, p. 16). The shift in cropping patterns presumably represented a rational response to changing economic conditions as the average per acre revenue derived from orchards and vineyards declined relative to that generated by field crops (California Crop and Livestock Reporting Service 1947, 1953, 1956). Because the optimal acreage of most field crop operations was larger than for fruit operations, a natural consequence of Arvin’s later development was larger farms.

The key point that follows from these findings is that strong economic reasons explain the larger farms in Arvin compared with Dinuba. The authors do not suggest that scale economies explain units of several thousand acres; however, the evidence does indicate that farms many times larger than those in Dinuba were required to capture the considerable economies stemming from different water and crop conditions. To imply that developing the land in smaller units would have resulted in planting more intensive crops such as vineyards, thereby leading to a Dinuba-like environment, overlooks the fact that few vineyards were being planted anywhere in California. To move into what was a depressed crop would not have been in the farmer’s economic self-interest. The hypothetical alternatives suggested by Goldschmidt’s work and espoused for nearly forty years by his followers imply substantial economic losses to landowners which would have adversely affected the community’s financial base. Whether or not the beneficial externalities attributed to small farms would have outweighed these losses is at best problematical.

Conclusion

The Arvin and Dinuba areas, rather than being closely matched regions, were different in a number of important ways. Differences in water costs, in mineral endowments, and in the age of agricultural development made Arvin and Dinuba unsuitable for the type of comparative analysis Goldschmidt employed. All else equal, small or mid-size farms may well promote higher quality rural communities than large farms. However, the one study most widely used to substantiate this assertion offers very little support; too many other variables besides farm size cloud the picture.

Goldschmidt’s study contains a wealth of information bearing on many of the points raised here. But to say that Goldschmidt’s evidence does not support his conclusions does not diminish the significance of the issues that concerned him. After almost forty years, much remains to be learned about the interrelationships between the size of economic organizations and a number of other socioeconomic variables. Understanding these issues in the 1980s requires that research be anchored firmly by a strong and accurate historical foundation. Hopefully, this paper has contributed to building that foundation.

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