

## V. A POSSIBLE PROGNOSIS FOR THE FUTURE

### Why California Agriculture Is Different

Willard Cochrane (1993) in his history of U.S. agriculture argues that agriculture in the United States has basically been “supply driven.” That is, production was initiated for self-consumption (subsistence), but marketable surpluses emerged as productivity increased. Contrary to Malthus’ prediction that demand would out-run supply, agriculture in developed countries has been characterized by production expanding more rapidly than demand (by expansion of area, yield increases, or both), leading to oversupply, low prices, and, ultimately, government intervention to support incomes. The individual farmer’s main defense to such situations was to improve efficiency by adopting new technology. But if new technology was rational for one, it was rational for all, so aggregate supply expanded further, thus pressing prices to lower levels. The argument thus arises that agriculture is on a perpetual “treadmill” of overproduction and low prices (Cochrane 1958).

But California agriculture was not settled by small homesteaders intent on feeding themselves first and then possibly producing small surpluses of basic commodities—grain, milk, eggs, and meat. California agriculture started with big farms and ranches producing much more than could be consumed by the farmers directly. California farmers produced to meet someone else’s demand—for hides and tallow on the East Coast and in Europe, meat for miners and those supplying miners, wheat for export, nuts and dried fruits for the East and Europe, and so on. This dominant focus on meeting changing product demands, coupled with the range of total products possible, meant that California agriculture could be opportunistic. But to be so, it had to constantly adapt to survive and, yes, thrive.

Constantly adjusting to changing opportunities has meant that California agriculture has a perpetual thirst for new technology—better and cheaper is always a potential market advantage. Being a long distance from markets for both outputs and inputs placed an extra premium on efficiency and adaptiveness. This set of factors pulled California agriculture through a quick sequence of changes that, as incomes climbed and population grew,

meant that California agriculture became more and more diversified—200 crops in 1970, 350 in 2000.

A lesser focus on basic crops meant that California agriculture has been less influenced by, or dependent upon, U.S. farm programs. However, if programs offered opportunities, California agriculture made the best of them. After all, an agriculture that is more efficient or productive than that of the rest of the country should be able to perform better. California agriculture has done so in cotton, rice, and dairy.

Being less focused on Washington, California agriculture sought favorable state policies on water, transportation, research, and development, as well as favorable tax treatment. Until 1961, rural areas dominated the state senate. California agriculture was able basically to get its own way pre-WWII and remained a powerful force thereafter, at least until it lost the Peripheral Canal battles in the 1970s.

A few other distinctions will round out our case that California agriculture is different. It has always been a capital-intensive but simultaneously very seasonally labor-intensive agriculture. California agriculture has always had a strong dependence on distant markets but, as its own state market grew, it adjusted to meet growing “in-state” demands. It has benefited greatly from being in the middle of a rapidly growing and rich “domestic” market. Having access to 35 million local customers is preferable to having only 0.75 million (as in North Dakota) or even three million (Iowa).

The constant adjusting to meet changing demands of affluent consumers has had consequences for the nature of California agriculture. Since 1952, the share of output accounted for by annual field crops has fallen precipitously while production of higher-valued vegetable and perennial crops (nuts, fruits, ornamentals, nursery crops, and grapes) has increased substantially. Dairy production now dominates the livestock sector. The result is that a rising share of California agriculture is on longer, multiyear production cycles. This necessitates a longer planning framework if periodic price run-ups are not to be followed by rapid buildups in production capacity, which inevitably result in market gluts and falling prices. This is currently happening in the wine industry worldwide.

Thus, our case is that California agriculture is different in that, being demand-driven, it fills many niche markets that are by definition thin markets. Booms and busts, the result of thin markets combined with multiyear production cycles, have historically characterized these markets. California agriculture has dozens of “commodity cycles” going on simultaneously. This leads to constant instability, so the need for rapid adjustments is endemic. California agriculture has many production options and, thus, it has historically been nimble, quick, and able to demonstrate that it can meet changing environments, exploit opportunities, and be competitive in domestic and foreign markets. Examples include:

- It beat Europeans out of domestic and foreign markets for fruits and nuts at the turn of the 20th Century.
- It saved the processing tomato industry by radically altering the nature of the tomato and how it was harvested.
- It now dominates world markets for almonds, going from a marginal exporter to 80 percent of world markets in less than 20 years.
- It established a pistachio industry from nothing.
- It went from being an “also ran” producer of jug and popular-priced wines to a world-class wine competitor. A blind-tasting victory in Paris in 1976 proved that California could beat the French at their own game.

California agriculture has a remarkable, but not painless, history of successful adjustments to changing times, most of the time emerging as a different but stronger sector. We cannot find evidence from history that this picture will change materially in the next 25 to 50 years.

### Bottom Line: What Are California Agriculture’s Chances?

#### California Agriculture Compared to U.S. Agriculture

It is now time to end this story. We have consulted history. We have argued that California agriculture has performed well compared to U.S. agriculture. Based on the total value of crops and livestock marketed, California became the highest-ranking agricultural state in 1948. It has maintained that ranking ever since while increasing the difference between it and the second most important agricultural state (Table 15).

In 1950 California accounted for 8 percent of the total value of U.S. agricultural production. Since then, the share has steadily risen. In 2000 California agricultural production was worth \$25.5 billion, amounting to 13 percent of the U.S. total. The value of California agricultural production of crop and animal products is now more than the combined value of the next two states, Texas and Iowa.

But California agriculture’s dependence on federal

**Table 15. California’s Increasing Share of U.S. Agricultural Production – Rank and Value of Agricultural Production in Billion Dollars, 1950–2000**

1950			1960			1970			1980			1990			2000		
<b>Rank and Value of Production</b>																	
1	CA	2.3	1	CA	3.2	1	CA	4.5	1	CA	13.5	1	CA	18.3	1	CA	25.5
2	IA	2.1	2	IA	2.5	2	IA	3.9	2	IA	10.0	2	TX	11.8	2	TX	13.3
3	TX	2.1	3	TX	2.3	3	TX	3.1	3	TX	9.0	3	IA	10.3	3	IA	10.8
4	IL	1.7	4	IL	1.9	4	IL	2.7	4	IL	7.9	4	NE	8.7	4	NE	9.0
5	MN	1.2	5	MN	1.4	5	MN	2.0	5	MN	6.3	5	IL	7.8	5	KS	7.9
U.S.		28.3	U.S.		34.0	U.S.		48.7	U.S.		136.4	U.S.		169.3	U.S.		193.6
<b>California’s Share of Total U.S. Value of Agricultural Production</b>																	
8%			8%			9%			10%			11%			13%		

Source: U.S. Department of Agriculture, Economic Research Service 2003b.

Table 16. California Agriculture's Minor Dependence on Direct Government Payments, 1950-2000

Payments in Million Dollars											
1950		1960		1970		1980		1990		2000	
CA	9	CA	22	CA	132	CA	14	CA	252	CA	667
IA	5	IA	21	IA	236	IA	45	TX	974	TX	1,647
TX	15	TX	73	TX	543	TX	231	IA	754	IA	2,302
IL	6	IL	18	IL	167	IL	36	NE	625	NE	1,407
MN	6	MN	32	MN	152	MN	70	IL	506	KS	1,232
U.S.	185	U.S.	695	U.S.	3.7 bil	U.S.	1.3 bil	U.S.	9.3 bil	U.S.	22.9 bil

California's Share of Direct Government Payments to U.S. Agriculture					
5%	3%	4%	1%	3%	3%

Source: U.S. Department of Agriculture, Economic Research Service 2003b.

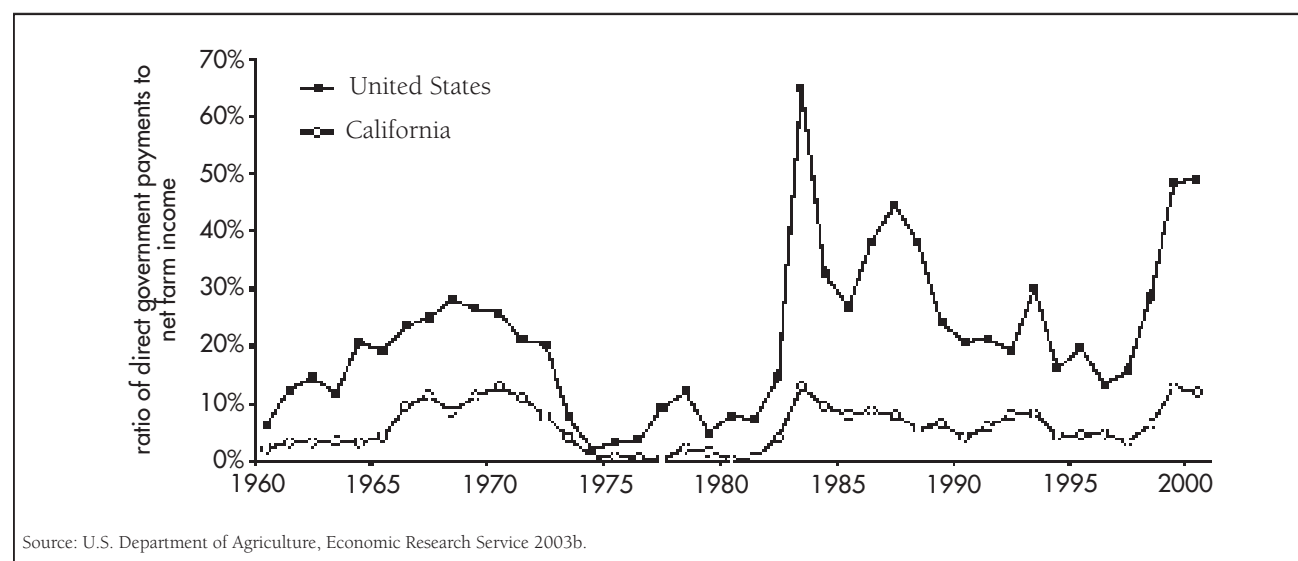
government farm payments has been significantly less than that of the rest of U.S. agriculture (Table 16). In 2000 California's payments amounted to \$667 million out of total U.S. direct government payments of \$22.9 billion—only about 3 percent of the total. In contrast, Iowa received about 10 percent of U.S. payments and Texas received about 7 percent. It is likely that payments to California producers will fall relative to grain-belt areas because field-crop production will continue to decline as growers shift to higher-gross-income crops as markets permit.

An additional way to indicate the relative independence of California agriculture from direct government payments is to look at the share of net farm income (gross sales

minus production costs) made up of direct government payments. Over the period 1990-2000, direct government payments to U.S. producers were 28.3 percent of net farm income. The comparable average for California was 7.4 percent of net farm income. Figure 20 shows annual ratios over the period 1960-2000.<sup>15</sup> Direct government payments constituted 49 percent of U.S. net farm income in 2000 and 12 percent of California net farm income.

Direct government payments increase the fixed cost of agricultural production without any corresponding increases in productivity (Bernard et al., p. 26).<sup>16</sup> In the U.S. heartland (the Midwest corn belt), direct government payments account for nearly a quarter of the value of farmland (Bernard et al., p. 28). A recent (2001) study

Figure 20. Direct Government Payments as a Percentage of Net Farm Income for California and the United States, 1960-2000



of soybean production in Argentina and Brazil concluded that production costs were 20 to 25 percent lower than in the U.S. heartland even though variable input costs per acre were lower in the U.S. (Schnepf, Dohlman, and Bolling, p. 31). Annual land costs were as much as \$80 per acre higher in the U.S. Thus, higher capitalized asset values affect competitiveness. California agriculture is more flexible and more responsive to changes in market conditions with its managerial ability to meet market-driven domestic and worldwide consumer demands. Part of that flexibility and responsiveness comes from less reliance on direct government payments.

**Bottom Line:** California agriculture is growing more rapidly than U.S. agriculture, is more flexible in selecting production alternatives, is more responsive to market-driven demand signals, and is significantly less vulnerable to federal budget cuts. Every one of these attributes is a plus.

### Diversified Product Mix

As noted, California produces an incredible and ever-growing variety of products. Babcock argues that historically a never-ending quest for low cost and efficiency guided the structure of U.S. agriculture in the direction of high-volume, low-cost production of basic commodities (wheat, corn, soybeans, etc.), but, as incomes continue to rise, things change.

*That is, once we can afford all the food we could possibly want to eat, we will begin demanding high-end food that often can only be produced using costly production practices. Once this occurs, agriculture must develop new market channels and market regulations to give producers who invest in product quality a chance to obtain a return on their investment. (p. 3)*

Babcock's case parallels arguments saying that, as consumers become wealthier and production techniques more precise, designer and niche markets will quickly replace bulk, undifferentiated commodities. California seems well placed to address these changing market requirements.

Globalization, plus increased ethnic diversity in California and the U.S. population in general opens additional niche possibilities. Historically, expansion in the number of California crops was partly driven by ethnic-food demands from rising numbers of immigrants from around the world, especially from Asia and Latin America.

**Bottom Line:** Our agroecological heritage plus demand diversity will be a distinct, continuing advantage for California agriculture. Who really cares if we can compete in barley, soybeans, and hogs when we can sell avocados, pistachios, and wine?

### Population Continues to Grow in our Most Important Markets

In the 21st Century, the three most important markets for California agriculture will be California, the United States, and higher-income, developing countries. All will continue to experience significant population growth (Table 17).

While projected growth in California to 2040 will not be as rapid as in the last 40 years (70 percent versus 117 percent), it will still be substantial—an increase of more than 24 million customers compared to a smaller increase (18.6 million) in the preceding 40-year period. For the U.S. market, projected growth is slightly higher in the next 40 years (38 percent versus 34 percent). Most important, U.S. growth represents an increase of an additional 105 million customers, a larger growth increment than for the preceding 40-year period. As noted earlier, global population will increase by around 2.8 billion people with the majority residing in developing countries. A

**Table 17. Population Growth (Millions) in California and the United States for 1960, 2000, and 2040**

Year	California	United States
1960	15.9	179.3
2000	34.5	275.3
2040	58.7	380.0
	> +117%	> +34%
	> +70%	> +38%

Sources: California State Department of Finance 1998, 2001; U.S. Department of Commerce 2002.

<sup>15</sup> The California ratio of payments to net farm income never exceeded 15 percent during the past four decades and exceeded 10 percent in only seven of the years. In contrast, the U.S. share of net farm income made up by federal direct payments was below 10 percent in only nine years, exceeding a quarter of net farm income in 14 years and a maximum of 65 percent in 1983.

<sup>16</sup> Urban influences also increase agricultural asset values in the same manner.

further plus is that their incomes should also be growing rapidly.

**Bottom Line:** California agriculture is well positioned to take advantage of continued growth in state, national, and global population with parallel growth in incomes.

### Vulnerability to External Shocks

California agriculture has always been vulnerable to its external environment precisely because it is demand-driven. Given that it produces predominantly income-sensitive products, growth, recession, depression, and global economic events (e.g., the East Asian crisis in late 1990s) all potentially cause significant changes in prices. This fact, coupled with a rising share of California output being perennial crops and livestock, means that the potential for boom or bust cycles is probably rising. Thus, the operative question is whether the external environment is becoming more volatile with increased global interdependence along with the rising dependence of all nations on trade.

Leaving aside war and massive natural disasters (e.g., international droughts, floods, earthquakes, and major weather events), lowered trade barriers and freely functioning financial markets should increase international market stability compared to a world of protection and controlled financial flows. On the other hand, it is less and less possible for nations to isolate themselves from international economic events.

**Bottom Line:** While there is no strong evidence that global markets are becoming less stable, it is possible that, as individual countries liberalize, domestic price instability could increase, presenting additional challenges to farmers, growers, and ranchers.

### California Agriculture at the Beginning of the 21st Century

California agriculture grew very rapidly over the past half-century. Real value of production increased 70-fold. Agricultural production is now widely diversified to more than 350 commercial plant and animal products, exhibiting a constantly shifting composition and changes in the location of production, all abetted by growing demands

for its products and rapid science-based technological changes. California agriculture is strongly buffeted by growing urban pressures for availability of key natural resources—reliable water supplies and productive land. Relentless pressure from environmental and other non-agricultural interests remain with respect to water quality, chemical contamination, air pollution, wildlife and aquatic habitats, and worker safety in the forefront.

Agricultural prices clearly became more volatile after the global instability of the early 1970s. As agriculture became more complex internally, both technically and economically, it also became more interdependent with the rest of the economy and the world. It now purchases virtually all of its variable inputs from the nonagricultural economy and has a massive need for credit—short-term, long-term, and, increasingly, intermediate credit. It has probably become more export dependent despite the enormous growth of the California consumer market. In sum, it is more dynamic, more complex, more unstable, and more diverse, thus making California agriculture more vulnerable to external events.

At many critical points in California history, California agriculture has been written off, but these periods of difficulty have been interspersed with more numerous periods of explosive growth (Tables 18 and 19).

The share of perennials, or multiyear-production-cycle products, increased as California agriculture moved away from production of annual field crops (wheat, barley, cotton) and canning vegetables and shifted toward tree nuts, fresh fruits, and wine grapes. The frequency and amplitude of product price cycles (booms and busts) seemed to increase. For example, an overabundance of average-quality wine grapes is occurring as recent plantings (those planted in the late 1990s) have come to harvest maturity. There have been cycles in other products, such as prunes, clingstone peaches, and raisin grapes. The first years of the 21st Century are only the second time in history that low prices occurred across the entire product spectrum. The first was during the long-lasting Great Depression. But already in 2003 and at the beginning of 2004 there are signs of improvement in some prices, promising an improved economy.

**Table 18. Difficult Periods for California Agriculture**

<b><i>In the 1860s</i></b> Decimation of cattle herds by floods and drought.
<b><i>In the 1890s</i></b> Collapse of the wheat industry.
<b><i>In the 1920s and 1930s</i></b> Severe overdraft of groundwater supplies.
<b><i>In the 1960s</i></b> Termination of Bracero Program.
<b><i>In the 1970s</i></b> Collapse of export markets; Medfly crisis.
<b><i>In the late 1980s</i></b> Prolonged drought of 1987–1992.
<b><i>In the late 1990s</i></b> Collapse of virtually all commodity markets (low prices).

**Table 19. Periods of Explosive Growth in California Agricultural Industries**

<b><i>1850–1860</i></b>	Cattle
<b><i>1870s</i></b>	Sheep
<b><i>1880s</i></b>	Wheat
<b><i>Early 1900s</i></b>	Dried Fruits and Nuts
<b><i>1920s</i></b>	Fruits and Processed Vegetables
<b><i>Late 1940s</i></b>	Cotton
<b><i>1950s and 1960s</i></b>	Beef Feedlots
<b><i>1970 to Present</i></b>	Dairy
<b><i>1970s and 1980s</i></b>	Specialty-Product Exports(almonds, citrus)
<b><i>1970s</i></b>	Fresh Vegetables
<b><i>1980s</i></b>	Premium Wines
<b><i>1980s</i></b>	Nursery and Greenhouse Products

**Bottom-Bottom Line**

What about the future in the long run? There are no sure predictors. Can we draw upon our understanding of the forces that have shaped the past to reflect on the future? What history suggests is that, for more than 150 years, California agriculture has generally flourished even as it was being constantly buffeted by what seemed at the time to be “disaster after disaster.” So far, it has emerged from each crisis by rapidly adjusting and changing. California agriculture in 2003 is very different than it was in 1953, 1903, or 1853. It is bigger, more diverse, and

very much alive, adjusting, as always, to its ever-dynamic environment. No doubt California agriculture in 2023 or 2053 will be very different than it is now, but it will have maintained its vitality though experiencing, as is its fate, chronic and sometimes powerful adjustment pressures. Those forecasting its demise simply do not understand its natural and human assets nor do they acknowledge the dynamic resilience of California agriculture.