FINANCING AGRICULTURE IN CALIFORNIA'S NEW RISK ENVIRONMENT

Proceedings of a Conference on December 1, 1993 in Sacramento, California

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Contents

Conference agenda ................................................................. ii

Preface ..................................................................................... iii

Video script ................................................................................ 1
  Creation of the New Lending Environment

Keynote address ......................................................................... 9
  Agricultural Restructuring in the 1990s: A Global Opportunity
  Eric P. Thor, Jr

Research paper #1 ................................................................... 42
  The Risk & Credit Environment
  Faced by Agricultural Borrowers
  Steven C. Blank, Jerome B. Siebert, T.J. Wyatt
  Panel Response ........................................................................ 89

Research paper #2 ................................................................... 99
  The Supply of Agricultural Credit
  Karen Klonsky, Steven C. Blank, Robert C. Thompson, Jr., Thomas W. Hazlett, Lawrence E. Shepard
  Panel Response ........................................................................ 149

Research paper #3 .................................................................. 159
  Public Policy and the Recent Agricultural Credit Environment
  Daniel A. Sumner

Research paper #4 .................................................................. 179
  Agricultural Risk: Definition, Assessment, & Management
  Charles Hyde, David Zilberman, James A. Chalfant
  Panel Response ........................................................................ 211

Epilogue: Putting the Pieces Together ...................................... 221
  Steven C. Blank

Biographies ................................................................................ 228
Conference Agenda

Financing Agriculture in California's New Risk Environment

Welcome
Kenneth R. Farrell
UC Vice President
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Video
Creation of the New Lending Environment

Keynote Address
Agricultural Restructuring in the 1990's: A Global Perspective
Eric P. Thor, Jr.
School of Agribusiness & Environmental Resources
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"The Risk & Credit Environment Faced by Agricultural Borrowers"
Steven C. Blank
Department of Agricultural Economics
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"The Supply of Credit"
Thomas W. Hazlett
Department of Agricultural Economics
UC Davis

"Agricultural Risk: Definition, Assessment, & Management"
David Zilberman
Department of Agricultural and Resource Economics
UC Berkeley

"Public Policy and the Recent Credit Environment"
Daniel A. Sumner
Department of Agricultural Economics
UC Davis
Preface

For the 45th consecutive year, California led the nation in total marketing receipts in 1992 with more than $18 billion. That represents roughly 11 percent of the national gross cash receipts being produced on just 4 percent of the nation’s farms. Agriculture is big business in California, and we bring an issue before you that is imperative to the business—financing the operation.

Members of the lending sector encouraged the University to create a position focusing on agricultural finance because they feel that it is an important topic. Even though the financial crisis of 1980s has come and gone, the lending environment, like any other component of agriculture, will always be dynamic. Lenders expressed the need to have a university researcher who will keep pace with the changes that occur in the lending sector. We responded by hiring Dr. Steven Blank as an agricultural finance specialist for the University of California Cooperative Extension Service.

Since joining the university, Dr. Blank has spent much time meeting with various lenders, and in the course of numerous discussions, has witnessed a real need to explore this topic with borrowers and lenders alike. He organized half-day workshops for agricultural borrowers, and discovered that people had many questions to ask with regard to the current lending environment.
At the same time, members of the Agricultural Issues Center Advisory Board and the Giannini Foundation Executive Committee were expressing an interest in agricultural finance. Together, Harold Carter, Director of the Agricultural Issues Center, Hoy Carman and Andrew Schmitz of the Giannini Foundation, and Steve Blank consolidated their ideas and developed the plans for this conference.

The U.C. Center for Cooperatives, with its director Mahlon Lang, also contributed to this research project, noting the growing number of agricultural cooperatives which are offering financial services to their members. We also thank representatives from the Agricultural Issues Center Advisory Board and various agricultural enterprises and lending institutions for their time and input throughout the planning and research phases of this project which have gone on for nearly a year.

This project epitomizes the mission of the University of California. It is a direct product of integrating the programs of extension, research, and public outreach—a traditional and still crucial goal of a land-grant university.

The goal of this study project has been to help bring about an understanding of the current financial environment in agriculture and to facilitate an exchange of ideas and dialogue which will hopefully lead to viable options for all sides of this issue.

Kenneth R. Farrell
Vice President
Division of Agriculture and Natural Resources
University of California
Acknowledgments

Many people contributed greatly to organizing this study and the conference. We thank them all for their time and ideas.

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Research Groups

“The Risk and Credit Environment Faced by Agricultural Borrowers”
Chair: Steven C. Blank, Agricultural Economics, UC Davis
Jerome B. Siebert, Agricultural & Resource Economics, UC Berkeley
T.J. Wyatt, Agricultural Economics, UC Davis

“The Supply of Credit”
Chair: Thomas W. Hazlett, Agricultural Economics, UC Davis
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“Agricultural Risk: Definition, Assessment, & Management”
Chair: David Zilberman, Agricultural & Resource Economics, UC Berkeley
James A. Chalfant, Agricultural Economics, UC Davis
Charles Hyde, Agricultural & Resource Economics, UC Berkeley

“Public Policy and the Recent Agricultural Credit Environment”
Chair: Daniel A. Sumner, Agricultural Economics, UC Davis
Mike Poe, Maverick Video Productions, Inc., was responsible for visuals during the conference and production of the introductory videotape. Ray Coppock and Stephanie Weber wrote the video script. Steven Blank, Harold Carter, Seth Hall, Karen Klonsky, and Daniel Sumner served on the video script advisory committee.

Steven C. Blank was the project chair, and Stephanie Weber was the project coordinator and technical editor.

A special thanks goes to Sandy Fisher of the AIC for handling the many administrative details and for her patience and skill in producing these proceedings.

Harold O. Carter  
Director  
Agricultural Issues Center  
University of California
Creation of the New Lending Environment

To provide a brief history and introductory glimpse at the central issues, the conference opened with an eleven-minute video, setting the stage for the more detailed presentations which followed. This is the script of the videotape which is available from the AIC.

Today, from the perspectives of both farmers and those who lend money to farmers, the economic ups and downs of recent decades were an important precursor to what is being called "the new risk environment of the 1990s." Of course, there are other important components of risk in agriculture—environmental constraints, for example, and competition in the global marketplace. In considering the current situation of agricultural financing in California and the nation, it may be helpful to review significant events in agriculture since World War II.

During the 1950s and 1960s, new agricultural technology not only set the stage for more productivity but also helped to create large market surpluses in many crops. Warehouses overflowed with corn, cotton, butter and other commodities; and as a result prices stagnated. The federal government's response, with general agreement by both political parties, was to re-invigorate farm commodity programs and price supports. One important tool was to set aside part of the nation's farmland in order to reduce crop surpluses.
But before looking at the boom of the 70s, we need to review the system of agricultural credit that played such an important role in these developments. Only by borrowing could most farmers enlarge their acreage, purchase more off-farm inputs, and make use of new technologies.

Who did they borrow from? There were four major institutional sources of agricultural credit—that is, beyond merchants, commodity dealers, and other individuals who extended credit to farmers. These major institutional lenders were life insurance companies; commercial banks; the Farm Credit System of land bank associations and production credit associations; and the Farmers Home Association, operated by the federal government.

At the beginning of the 1970s, these financial institutions, like all of agriculture, were poised for growth. The cooperative Farm Credit System, in particular, had been increasing its share of total loans to agriculture—from 23.8 percent in 1970 to 39 percent by 1980. In California, their share went up during the same decade from 17.3 percent to 29.6 percent.

In the year 1970, crop shortfalls in several nations, including the Soviet Union, triggered a sudden

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**Figure 1.** U.S. Net Farm Income

![Graph showing U.S. Net Farm Income from 1950 to 1990](image)

*Source: Economic Indicators of the Farm Sector*
upsurge in overseas sales of U.S. crops. Farm prices in the U.S. shot up and net farm income almost tripled between 1970 and 1973 (Figure 1). Agricultural exports, particularly of corn, wheat and soybeans, began a steady increase which did not peak until the end of the decade. Meanwhile, the falling value of the dollar contributed to buying power abroad. As a result, U.S. farmers were encouraged, both by the booming market and by the relaxation of government supply-control programs, to “plant fence-row to fence-row”—a phrase that became famous.

This boom in farm output of the 1970s was accompanied by a large increase in the amount of money owed by farmers (Figure 2). One important reason for this was that interest rates remained relatively low. In fact, real interest rates—that is, after allowing for the effects of inflation—were close to zero during much of the decade.

Figure 2. U.S. Farm Debt

And there was another cause for the increase in agricultural debt—as long as farmland prices continued to rise, there seemed to be little or no risk in making loans to buy land.

The agricultural boom of the 1970s seemed too good to last, and it was. During the late 1970s, the
Federal Reserve Board, concerned about runaway inflation, began to squeeze the nation's money supply. The prime rate went from under seven percent in 1976 to a record high of almost 19 percent in the early 1980s. At the same time, the share of farm income going to pay interest charges on loans increased dramatically—to almost 50 percent by 1982. Meanwhile, U.S. farm exports dropped sharply. As a result, crop prices collapsed, livestock prices stagnated, and by 1984 real net cash income to farmers was almost 30 percent below the level of the late 1970s.

The collapse in farm income inevitably led to lower land prices, especially where farmers were unable to make their loan payments. The average price of U.S. farmland fell almost one-third during the first part of the 1980s (Figure 3). In California, agricultural land prices fell nearly 20 percent.

By the mid-1980s, somewhere between 200,000 and 300,000 U.S. farmers had failed financially. In fact, the evidence suggests that, of all farms with annual sales of $40,000 or more, almost one in five went out of business during these few years. Naturally the lending institutions supporting these farmers also took huge losses.

**Figure 3. U.S. Land Values**

![Graph showing U.S. Land Values](image)

*Source: Agriculture Resources, Situation & Outlook*
Nationally, the economic crisis for agriculture reached bottom during 1986, and a rebound took place during the last three years of the 80s. Several forces encouraged this recovery. For one thing, better financial management and tighter cost control on the farm began to pay off. Also, new farm programs drastically cut crop acreage and led to record high government payments to farmers. And a new federal program was set up to subsidize exports of U.S. farm commodities.

As a result, farm real estate values started a steady—but slow—recovery. (Still, when adjusted for inflation, farmland prices in 1992 were about the same as in the mid-1960s.) Meanwhile, the amount of outstanding farm debt dropped steadily through 1990, then showed a slight rise. In 1992, interest payments absorbed only about half as much of U.S. farm income as they had five years before.

All these ups and downs of the U.S. farm economy and of farm credit institutions since the 1950s have helped to set the stage for agricultural lending during the decade of the 90s. But the conditions faced by agricultural borrowers and lenders today—particularly the new emphasis on risk analysis—also reflect powerful forces outside of agriculture.

Probably the most important of these external factors is what has happened to the U.S. banking system itself in recent decades. Until the mid-1970s, banks in this country enjoyed a post-war period of relative stability and profitability. The national economy grew steadily, competition from non-bank lenders was relatively unimportant, and government regulations generally favored the banking establishment. In short, risks tended to be minimal, and profits tended to be dependable.

Over the last two decades competition and risk-taking intensified in the banking system and tended to reduce profit margins for many banks. During the 1980s bank failures increased throughout the nation—first a few smaller banks in farm areas, then some mid-sized banks due to falling energy prices, and finally more and larger banks as a result of collapsing real estate values and, in some cases, defaults on loans by Third World countries. Very few bank depositors actually lost money, but the
Federal Deposit Insurance Corporation’s backup funds were wiped out and had to be replenished by Congress. Meanwhile, from the nation’s viewpoint, this trauma within the banking system was a footnote to the far more devastating economic damage caused by the savings-and-loan disaster.

Although economic stress was felt throughout the system, most banks entered the 1990s in reasonably good financial condition. However, a wave of mergers was taking place. Between 1985 and 1991, more than 4,000 U.S. banks disappeared as a result of mergers. Most of them were in good financial health, but they were under pressure from the same forces that caused the bank failures. Those forces—which are helping to create the new risk environment of the 1990s—are new technology; fewer regulatory restrictions in such areas as branch banking; and intense competition involving not only banks but other financial institutions.

Thus, agricultural lending in the 1990s has been influenced by historical forces—by the booms and busts of the nation’s farm economy and by hard experience within the banking system itself. The events of the 1980s have made farm credit bond holders and bank stock holders much less willing to take risks.

Other forces are at work, too. An overriding factor, of course, lies within the national economy—a complex blend of recession and fundamental restructuring. Layoffs and downsizing by domestic industries in global markets; the economic hangover from the savings and loan debacle; the national budget deficit; cuts in defense spending—all these and other forces have to be dealt with along with a crisis in consumer confidence. Clearly, the reaction of financial institutions to these problems will influence agricultural lending policies.

Beyond all these, agriculture also faces its own special risks involving natural resources and the environment. For example, pest control is becoming more difficult every year both because of tighter regulations imposed by society and because of natural developments such as pest resistance and invasions by new pests. For another example, the recent drought demonstrated clearly how vulnerable much of California agriculture is to water
shortages. In fact, the reliability of a farmer’s water supply has become one of the routine questions asked by agricultural lenders.

Still another force shaping the lending environment of the 1990s is ever-changing technology—particularly the new information systems.

All this leads to the conclusion that the era of more relaxed, personal relationships between farmers and lenders has gone the way of the five-and-ten-cent store and the nickel ice cream cone. No longer is risk analysis a matter of a lender knowing a farmer’s character and the history of the farm. That may still help; but today, a potential loan can be objectively assessed in terms of international markets and the statistical riskiness of particular crops. This is the new lending environment.
Agricultural Financial Re-Structuring in the 1990s: A Global Opportunity

Eric P. Thor

I. Summary and Overview

In California, the United States and the world, the 1990s have brought a challenging set of economic, legal and financial conditions for bankers, agricultural lenders and borrowers. The lending environment is restructuring for many reasons. This is changing the risk profile of California’s agricultural lending. Several of the most significant trends include:

- **The technology of agricultural banking.** Changes in telecommunications, computer networks, and analysis make it possible to make deposits, withdrawals, and communicate with customers for both large and small banks. Similar technology allows government institutions and central banks to regulate financial institutions throughout the state, nation, and world. “World Class” agricultural lenders, like Bank of America, First Interstate, Japanese banks, or Rabobank, all use technology as a major advantage in the marketplace. Farmers, ranchers and agribusiness
leaders can access their accounts twenty-four hours a day. Commodity markets are linked to financial markets by technology. Bankers can review their customers on a continuous basis. This provides for additional opportunities and challenges as both the distance and scope of the market is ever changing.

Globally, there are many examples of this. For agribusiness banks, the SWIFT and similar technological systems allow institutions to link ultimately with financial intermediaries, markets, and other agricultural regions in our growing world financial network. This network includes many new financial lenders, insurance companies, and finance cooperatives to name a few. Today, it takes less than an hour for deposits or funds to be transferred from Sacramento, California to Voronezh, Russia—approximately 12,000 miles away. Similar customers can be linked in Tokyo, Toronto, Mexicali, London, or Bombay.

For most agribusiness banks technology now allows them to track credit files and liquidity ratios for all their customers with a speed only dreamed of a few months ago.

Another advantage of today’s banking systems is that technology allows agricultural banks to implement policy changes quickly.

The emerging “information highway” and a simple PC allows one to originate loans, deposits, and innovative banking products in any one of the two hundred languages around the world. Today’s electronic network links billions of accounts for personal and business uses. In a world that has upward of two billion people in agriculture, agricultural banking is not only important, but is required. Today, the world is focusing on capital intensive systems for producers, harvesters, distributors, and marketers of food and fiber products; a great opportunity for bankers and others in the financial services industry.

Closer to the West Coast, as the North American Free Trade Agreement (NAFTA) is implemented, Mexico’s 20 to 30 percent loan interest
rates with 15 percent spreads will offer significant opportunities. Intra-NAFTA bank barriers are coming down in the next decade. Today, the California "nation" must help lead the world in the technology of agribusiness banking if it is going to remain competitive and if its lending institutions are to be "world-class" competitors.

- **Global integration of agribusiness and banking markets.** As over one half of our production and products are exported, the global market is now a reality for California and U.S. agribusiness. In fruits and vegetables, cotton, citrus, and many of the two hundred plus agribusiness products in California, bankers and agribusiness must look outside our borders for markets and financial investments.

  The financial and economic implications of a freer world economy, as Europe moves toward greater financial and economic integration in 1994 and beyond, are staggering. Add the growth in China and Asian markets, and California agribusiness is situated in a way that can be a great opportunity. With little economic or financial warning, we are suddenly looking at a new, emerging market of over 720 million consumers in Eastern Europe and the former USSR and over five billion people in China—one of the fastest growing economies in 1993 and 1994. Vast agricultural regions and peoples encompassing eleven time zones with over 100 ethnic groups are moving forward toward a free market. They want to purchase American commodities, products, and goods. They all want to deal with the new financial realities of the global market.

  As California producers, processors and retailers all serve a global market, including Mexico and Canada, financial institutions must follow. This is part of the future of California agribusiness banking.
• **Increased regulation and oversight of banking.** The oversight of banking regulators has changed as a result of the financial bailouts and structural changes of the 1980s. In the past five years, several major laws have been passed which give the U.S. and state regulators new and expanded powers at a time when the global banking market is becoming more competitive in all major market segments, including agribusiness and agriculture.

Laws such as the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) and the Community Reinvestment Act greatly expand regulatory powers. Treasury Secretary Bentsen, in a recent article in the *Independent Banker* highlighted the directions of regulations as, “Our regulatory approach must be balanced to insure both bank profitability and safety and soundness.”1 The new laws greatly expand regulatory institutions’ powers and oversight. Regulators can electronically audit accounts and customers without leaving Washington.

• **Decreased role of government financial support for agriculture.** Additionally, for those crops that depend upon support payments and cash flow from the government, cash flow is decreasing. This will cause additional concerns for bankers and borrowers alike.

Whether we like it or not, today is a time of change in the regulation, law, and management of ag lending. Fortunately, California agriculture is less dependent on government cash flow than the Midwest states. Most farm operators and agribusinesses are more market oriented.

Under the Clinton administration, there are several areas where the rules are going to modify the revenues, expenses, asset values, and liabilities for farmers, ranchers, agribusiness operators, and their bankers. The new laws and their regulations

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will adjust the cash flow for many of California's producers and agribusinesses.

Bankers and agribusiness leaders must help convert these structural and policy changes into positive fluctuations in cash flow and asset adjustments for their institutions and their clients. Importantly, these transformations will set the competitive positions of agricultural banks for the next century and into the next millennium. This seems far away, but it is just six short years from today. This is important because unlike the Disneyland "Tomorrowland" ride, these transformations are a real permanent reformation for all bankers.

II. Specific Changes for the Future

Five of the most important specific areas that can cost agricultural bankers and customers money are:

(1) The changing farm rules under the Clinton administration and new Congressional mandates with their impact on production costs, government payments, taxes, energy costs, and regulation;

(2) The new banking regulatory environment with a change of leadership at the FDIC and bank examinations;

(3) The environmental protection changes proposed by the Clinton administration and currently scheduled revision in the laws which will take effect over the next couple of years;

(4) The new banking and financial institution market conditions brought about by the increasing national and international competitive pressures. This includes the increasing number of nontraditional lenders, international banks, investment banks, and insurance companies. Related is the fate of the final financial negotiations in the General Agreement of Tariffs and Trade (GATT) and NAFTA. Both will be
important. The vote on November 17, 1993, in Congress was an important step in helping California institutions compete in the growing North American market. Both agreements will impact our financial agribusiness and agricultural environment. This is particularly important for California and the Southwest.

(5) Finally, bankers and clients must focus on the changing role of "value-added" products and market integration. The bottom line is shifting toward "value-added" products and commodities.

Let us review each specific trend in light of the major transformation in California and West Coast agribusiness lending.

(1) Farm Program Rules Are Being Revised in Washington. The first specific change for California bankers and agribusiness leaders is to assess the alteration of the farm rules by Washington and their impact on specific accounts and cash flow. While I support the President's goals of stronger economic growth in jobs and income, as financiers we must be careful to assess the cash flow impact before lending for the 1994 production and processing season. Additionally, Federal water policy and other proposed adjustments will impact real estate loans. For agricultural bankers, it is important to look at each customer's forecasts of the revenues and costs of operations in light of the probable new rules.

For certain individuals and businesses the cash flow impact will change positively, for others it will not. The Farm Program rule changes are going to be substantial. Even with a new farm bill one year away, the congressional reorganization and presidential budget shifts will affect agricultural customers and banks this year. This year, Congress is making several financial adjustments normally reserved for major Farm Bill years. With over 120 new legislators, over one-half of the Agriculture Committee members are new. After fifty years, the depositions of Chairman Whitten and Senator Burdick have substantially altered the Ag Leadership in both
Houses. President Clinton’s Budget and Ag Proposals passed and proposed by Congress over the last few months contain a number of provisions which will affect bankers, managers of agriculture, and agribusiness. The President’s team has recently imposed or announced several items including:

- **An increase in the corporate and individual tax rates and costs including health care.** This will affect most large food and fiber companies. RJR Nabisco announced that the tax package negatively impacted earnings by $.04 a share in 1993. As the health care reform proposals are imposed, there may be a serious, negative impact on agricultural employers who hire large numbers of part-time and seasonal workers.

- **Growth in energy taxes.** The administration has implemented increases in taxes on energy use. This will boost the cost of high energy use systems such as drying, cooling and heating. It will elevate the input and operating costs of producers and processors. Both the amount of impact and time are unsure at this time. Offsetting this increase, operators may find ways to increase the energy efficiency of their production and processes which will largely offset the costs. Overall, though, most energy analysts expect an 8 to 10 percent cost increase for individual companies due to this provision.

- **A deficit reduction plan which has led to lower interest rates.** While Wall Street is skeptical, the President’s analysts feel that lower interest rates have offset and lowered overall costs of the President’s changes in agriculture. For bankers, the impact of asset and liability management changes need to be reassessed. One has to ask how much lower can short-term rates go since currently, short-term rates are at a twenty-year low.
• **An increase in water-use costs and grazing fees on public lands.** This is not enacted in detail, but the new administration expects to increase revenue by $1 billion over five years in this area. This is particularly disturbing in California and other western states with large public lands that are used by farmers and ranchers. The administration states that they must move toward market rates on public goods. This concept has previously brought significant controversy. Positively, the new plans of the administration suggest that good range management will be rewarded with dollars. Secretary Babbitt continues to lead the charge in this area.

• **A suspension of noneconomic timber sales on public lands.** This will impact some lenders who have clients depending upon timber sales for part of their revenue or infrastructure. For example, road maintenance in many areas is tied to sales revenues, so check to see if your ranchers are affected. Positively, the value of private timber holdings increases substantially under current plans by the Forest Service and the Department of the Interior.

• **Increase in water rates on public water projects or reduction in the subsidies as some political analysts like to argue.** This remains a very controversial part of the Clinton proposals. The Federal Budget is aiming for savings of $163 billion in the Interior Department by lowering subsidized funds for Bureau of Reclamation water projects, such as dams and irrigation projects. In California and other Western states, this is a major issue which has increased costs of individual producers by several thousand dollars per acre per year in California and Arizona. This will impact the Southwest this year as a number of major water projects in California, Arizona, New Mexico, and Texas remains unresolved. The rising cost of water has become a major issue for agricultural
banks throughout the nation. In California and Arizona, some farms have seen a ten-fold increase in rates in the past ten years. More efficient irrigation methods and better management can help offset this cost significantly. Farmers and ranchers, of course, will try to offset any increases with better water management and less water-intensive crops.

- **Streamline the Department of Agriculture** to focus on “farmer services.” This could help many farmers get “one-stop” support if the government will simplify the process. Secretary Espy has pledged to involve farmers and lenders in this process. For those of you who depend upon SCS, Farmers Home, or support payments, you should check with local offices to see what will happen in your state. With the current issues before Congress, this will probably not happen until later this year or 1995.

- **International sales and marketing programs** in USDA would be put on a pay-as-you-go basis by raising fees. With the current Russia debt problems and guarantees necessary for farmers and traders to sell product, the new administration will get an early test of this important area.

- **The reduction or elimination of agricultural subsidies to farmers with over $100,000 income.** The OMB budget estimates savings of $470 million. The administration is still suggesting new regulations and means testing for all farmers. Bankers will be in the middle as farmers struggle to be under the guidelines adopted by the President and Congress. President Clinton and Secretary Espy have announced that they want to target support to smaller farmers in rural areas.

- **Increase assessments on nonprogram crops after 1995 for government services.** It is very uncertain as to what this means. Government
analysts suggest that this will generate close to a $1 billion plus savings in the President's budget.

- **Reform of Crop Insurance and FCIC indemnities.** The administration hopes to save over $700 million in payments by eliminating these programs. The Crop Insurance mechanism would be changed to reduce the cost of the programs.

- **The President’s budget would reduce the number of wheat, feed grains, cotton, and rice acres eligible for support payments.** This continues to be a question that will be part of the new Farm Bill debate.

In addition to the announced proposed changes, there are a number of items which will change the focus of federal regulation and support of agriculture. For example, the transition team’s report to Secretary Espy has suggested a number of items which may impact both the assets and cash flow of a number of agribusiness bank clients. These include:

- **A refocusing of USDA on food, nutrition and rural development.** The new Secretary has announced he will be an “activist” in these areas. We can expect to see increased funding for the food programs including WIC, rural development, and infrastructure programs in SCS, ARS, RDA and FmHA. The proposed Rural Development Initiative proposed over $600 million in new outlays. These initiatives must be funded by taking funding away from existing programs.

- **An increased emphasis on “food safety.”** The Secretary is personally committed to increased oversight and inspection of meat and other perishables following the events in Washington and before the House and Senate Ag Committees. Secretary Espy visited Washington State and proposed a new game plan following the fast food deaths and illnesses last year.
A total of 160 new inspectors are currently in the budget increases for next year. While the problems of pathogens in foods are not new, one can expect new initiatives and regulations in this area. Producers, processors, and others can expect stronger controls and oversight.

- **Enhanced natural resource protection.** For operators near public lands and where environmental sensitive areas exist, the administration is proposing a number of changes. The Forest Service, Department of Interior, and the EPA all have proposed legislative changes which will impact traditional producers and processors. The *Christian Science Monitor* in March, 1993 outlined the Clinton Challenges in an article entitled, “Clinton Plan Challenges “Lords” of U.S. Rural West.”\(^2\) In the Western states, the natural resource changes proposed could be substantial.

Secretary Babbitt has outlined broad changes and reform of the management of the natural resources principally in the West. He is quoted as saying that Multiple Use skirts the central reality that in the new urbanizing West there is no longer enough space to accommodate every competing use on every section of public domain and land. Commodity production, timber, minerals, or livestock are increasingly infringing on the broader public values of open space, wildlife, wilderness, and recreation.

- **Increase “activism” and broad understanding of agriculture.** Positively, Secretary Espy highlights the serious problem agriculture has with the voters. America’s population has become more distant from the farm and understanding rural and small community issues. The average voter or American has little understanding of the rural or farm problems and challenges.

Among the group of 120 new legislators in Washington, there is only one farmer. In the latest redistricting farm states generally lost to urban states.

As a result, understanding and recognizing the importance of the food and fiber system is less than ever before. For example, current chairpersons of the Agriculture Committees and the Secretaries are not from traditional backgrounds. They do not understand the issues from a traditional program perspective. The top three natural resource posts have only one thing in common—they are all lawyers who have lived in large urban areas for the past decade. One common denominator is that at USDA, EPA, and the Department of Interior, the Secretaries are activists in water, environmental areas, and natural resource issues. They have all litigated and worked in a wide range of posts with groups from water to the Endangered Species Act.

Additionally, these are the areas from which new directions, ideas, and challenges in the next Farm Bill will come. As bankers, we need to understand and work with these groups to help promote positive change with the activism all three leaders are expected to take.

These are a few of the changes which were announced by the President and his Cabinet. As one can see, it is a long list and focused on President Clinton’s Vision for America, his key policy document. Some of these modifications will be positive, but others will not be for agricultural bankers and their clients. While the legislative wishes of the President and Congress may be different as the law is passed, it promises to be an interesting couple of years—not necessarily fun—for us all. Congress and agricultural groups will need to focus on these changes in the rules and work with a new Congress in the next few months.

Additionally, the American public is looking at agriculture and agribusiness closely. Bankers will be able to rely less on government supported cash
flow in certain commodities. A year ago Newsweek ran a story on “Pork” from Washington and listed the farmer as the “bad guy.” GAO has published a study on reducing USDA and government support for agriculture, the “blue book” as it is now called. This situation will reduce government payments to agriculture and agriculture’s influence in Washington.

(2) The Examination and Regulatory Agencies May Cost Bankers and Clients Money. A second major area where the agribusiness banking rules have changed is in regulations and oversight. This may cost bankers real money in the changes in the regulation, and expanded examination by the banking regulatory agencies. This is particularly serious for the FDIC and the Comptroller of the Currency. So far, only Mr. Gene Ludwig has been named by the administration to a top post. Many top regulatory slots remain unfilled. The FDIC today has little new leadership to help in this process. With the slowness of appointments in the Clinton Administration, it may be late 1994 before we get all the new leaders in these areas. The Washington Post and New York Times speculated that this could cause major problems. Complicating the problem, the death of C.C. Hope left the FDIC with a bare quorum. This will slow the clarification of the important changes of examination rules which will leave the examiners in disarray on exactly how the new laws and regulations will be interpreted.

It will prove to be a challenge for agricultural bankers that hoped to have a redefinition of the regulations to ease the regulatory burden of agricultural financial institutions. This will put the bankers in the unfortunate position of not knowing if they are being examined on the old methods or the new. Incorrect classification can cost bankers real money. It is particularly focused in large real estate and farm properties.

Regulators are also focusing only on the short term. Thus, California bankers and businesses today must focus

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on annual cash flow and income performance. The regulators and bankers increasingly are focused on issues such as cash flow and financial ratios. These items will have major impacts on the cash flow and one's ability to get a loan in a timely fashion.

(3) The Environmental Challenges of Agribusiness, Ranching, and Farming. This is another area where the new California agricultural banking practices can cost bankers and clients money. In the environmental area, there are several major risks which are very important for independent bankers. Environmental concerns and risks are present in many agricultural and agribusiness loans transactions. Over the past twenty years the American public, bankers, realtors, federal and state legislators, and agency personnel have faced the reality that the environmental challenges have increased dramatically. The American public still feels today that the legislature and management agencies are not doing enough. Fully 80 percent of the public polled feels the environment must be cleaned up regardless of cost. Both political parties advocate additional environmental regulations and laws. California and Arizona bankers and realtors are being affected by the laws, regulations, and oversight.

Three principal areas of concern include: (1) Endangered Species Act (ESA) (2) Compensation and Liability and (3) the Superfund Act and its amendments. These areas are important since at least five major agencies are putting out environmental oriented regulations which directly affect bankers and their clients. Businesses affected will include feed operations, fertilizer producers, grain elevators, chemical dealers and suppliers, poultry operations, meat-packing and rendering facilities, cattle ranches, hog-production facilities, dairies, and ranchers who use public lands.

President Clinton and the EPA Secretary, Ms. Carol Browner, routinely highlight this in their speeches. Ms. Browner, a close associate of Vice President Gore, is working on water and agricultural issues in many states including California. In the past, she has received high marks from some, but others caution on her legalistic
approach to sensitive matters of public and agricultural policy.

Congresspersons, agencies' employees, and legislators are under massive pressure to increase the oversight of all phases of environmental damage and risk. Today Congress and state legislatures have responded by enacting a complex regulatory and liability scheme to promote a cleanup of the environment, and to deter activities contributing to the perceived problems. The lack of focus on the issues can have massive financial impact. A few years ago, Hanson Corporation paid $50 million to clean up damage caused by a paint manufacturing subsidiary. This can be more than the company's net worth. Yet the laws are quite specific. In some cases even individuals can be held liable for actions taken many years ago.

In the West, the ESA has lessened private property and water rights if one of 200 plus plants or animals listed as endangered or threatened is found on the property. The fish and wildlife agencies must, under the law, carefully analyze the data regardless of cost or economic impact. It has already had an impact in several key cases, and banks and clients are often negatively affected.

Currently, the financial risks and potential costs of projects impacted by environmental concerns and considerations are great. Concerns today include the gray squirrel, the salmon, and the spotted owl. In most large public projects, agribusinesses' and many private businesses' costs will be incurred in mitigation of the damages. Some of these can be offset by increased revenue activities.

Even small California agricultural real estate sales are impacted by environmental laws and risks. Politicians, businessmen, and educators are not keeping up with the changes in the law. At both the federal and state level, laws have been enacted which mandate significant changes in the way businesses, banks, and public agencies mitigate these risks.

With new laws at the state and federal level, the Independent Bankers, American Bankers Association, the American Bar Association, National Realtor organizations, and similar state organizations concerned with collateral and ownership of real estate are now reviewing
the laws to see how to make the massive changes needed for individuals and organizations. There are an increasing number of laws and regulations which impact lenders.

III. Environmental Hazards Liability and Risk

Lenders, regulators, and realtors are significantly impacted by a number of important environmental laws and regulations. Both state and federal regulations are now part of the issues. The major statutes include: (1) "CERCLA" or the Federal Comprehensive Environmental Response Compensation and Liability Act of 1980 as amended, (2) SARA or the federal revised Superfund Amendments and Reauthorization Act of 1986. Together the purpose of CERCLA and SARA is to establish a liability scheme. This approach provides a procedural and financial mechanism to insure clean up of both active and abandoned properties contaminated with hazardous substances.

These statutes impose clean up liability on the current owner of the polluted site, past site owners, parties that arranged for disposal, parties that accepted the hazardous waste from the property, transportation to the site, and parties that operated the site. This liability is joint and several. Thus, the person or institution with the financial resources may be held totally responsible. An additional complication has been that Federal law and application of the regulations have been ambiguous.

While EPA and California EPA, again are currently looking at these problems, the parameters of owner and operator liability is at best unclear. Application of CERCLA may deem a financial institution an owner or operator. Lawyers and the courts suggest that there is significant uncertainty regarding the extent to which a secured creditor or real estate agent may undertake activities to oversee the affairs of a borrower or client, whose facility is encumbered by a secured interest for the purposes of protecting the security interest while incurring CERCLA liability and risk.

Similar uncertainty exists regarding the activities that a financial institution can undertake as a trustee,
personal representative, or in other fiduciary capacities while avoiding owner/operator status. Unfortunately, the federal courts have failed to define clearly a workable liability stand. Indeed, decisions in the Maryland Bank & Trust case, the Fleet Factors case, and the Bergsge Metal Corp. case suggest that the courts have adopted a different standard to fit the facts of each case. Thus, financial service institutions have currently no reliable guidance on exactly where the risks and liability lies. In 1993, EPA helped to mitigate some of the fears and problems in this area.

An organization or individual is strictly liable even though the polluted land was acquired years after the hazardous waste was deposited there. Individual liability may extend to corporation officers or employees actively involved in any capacity of the handling of hazardous materials. The parent corporation which oversees and controls pertinent activities of a subsidiary corporation also may be held liable as the “operator” of the site.

The “clean up” liability under the CERCLA, SARA, and related state statutes includes natural resource damages, as well as costs associated with the clean ups. This may include restoration. These costs can include a wide array of expenses including monitoring, assessing and evaluating the site, interim protective measures, removal of the hazardous substance, and the remedial measures. The government has reported costs to exceed $1 million on a site of less than one acre which was contaminated by spilled and leaking insecticides. The hazardous waste and materials covered by these regulations are listed in more than 50 pages of federal regulations. Included are chemicals which are relatively common—asbestos, creosote, parathion, and malathion.

**Steps to Ameliorate Risks for California Agricultural Banks**

For financial service institutions, there are several critical steps each individual and organization must take to assess and determine the risk of each transaction. See Appendix A for the key questions outlined by the bankers and lawyers who specialize in reducing risks. These
questions all require vigilant due diligence to reduce the financial risks and liabilities for individuals and businesses.

Each organization must adapt the guidelines to fit their individual situations. The general steps have been reviewed by California and American bankers. Experts generally concur that once a loan is made, then the environmental financial risks are incorporated into the transaction. Each of these steps requires the special attention of management of the financial and real estate institution. These assessments will be accomplished by a Pre-Loan Audit and Assessment, Improved Loan Documentation, Post-Loan Monitoring, Default, and Lien-Enforcement Techniques.

**Assessment and Pre-Loan Audit Are Very Important**

The most critical assessments of the environmental risks and hazards should precede the loan or closing of a transaction. Bankers and realtors will become parties to the environmental risks once there is a financial relationship or mortgage involved. Once the transaction is closed the banker or realtor is related to the problem even if he has little knowledge of it. Only in certain circumstances will the lack of knowledge hold the banker or realtor harmless. Task forces of bankers, lawyers, and realtors recommend the steps that the individual institution consider before the loan or transaction is concluded. The steps include:

a. A questionnaire or pre-loan assessment of current owner and operator. If past owners or operators are available, they should also be contacted;

b. A review of public records including city, county, state and federal records;

c. An on-site inspection of surface and sub-surface conditions; any surface water should be tested and studied;
d. An assessment of the costs of any changes in the operations needed to make the property environmentally sound.

The lender then must decide if the loan should be made or if adjustments should be made in the covenants of the loan. Insurance can be purchased, reducing the risks for individual properties.

Lenders, borrowers, and realtors must remember that many borrowers or operators may not be aware of all the potential environmental hazards on the property, or they may think that actions in the past did not pose any risk to the environment. Therefore, if a lender will be making a loan, he should take the next step—review of the public records.

In 1994, farmers and bankers will have to focus on the re-registration of pesticides and water quality legislation which will impact farmers and ranchers in the specialty crop area. Over 50 pages of new regulations are proposed in the pesticide area alone. This is a big concern for specialty crops, or where major pesticide outbreaks occur. In Arizona and California, cotton and vegetable yields were greatly influenced by the white fly infestations. Pesticides available a few years ago are no longer available. Sustainable agriculture requires a management which is environmentally sound.

These environmental challenges are part of the global reformations affecting us in the U.S. and the global financial institutions and markets. Politicians, lawyers, and consumers on a global basis will continue to demand that we confront these issues in the next few years. Rio was not the first or the last conference to focus on a series of problems caused by man in our interdependent world.

(4) Globalization and Trade Negotiations May Make Bankers and Clients Money. In 1994 two major trade agreements will impact California agribusiness and their bankers—GATT and NAFTA. In both agreements international agricultural trade reform is a central part of the equation. The Clinton Administration has reiterated its plan for world agricultural trade reform. They are
calling for eventual elimination of export and farm subsidies that distort trade. They also want to help create jobs and income in America. This will add a new dimension to future negotiations.

History shows that trade wars can be very costly and very distorting. In this new world order, future sales of commodities and food products will depend upon negotiations on a bilateral and multilateral basis. The U.S. food and fiber marketers will have to focus on selling products multi-culturally as well as to many different countries.

GATT is a positive proposal, establishing a framework for identifying and gradually eliminating trade distortions through agreements between the major producing and consuming nations. Many people have worked for the past eight years to reach some agreement on these thorny issues.

The current proposed agreement reflects the next logical step for international trading partners, which can make commerce and trade mutually beneficial for Canada, Mexico and the U.S. Concerns, of course, remain in the proposed NAFTA agreement. Importantly, this agreement will provide freer trade—not open borders as some have speculated. It is a preferential trade agreement.

Today, U.S.-Mexico agricultural trade reflects many of the positive and negatives aspects of the two nations. Both nations share many common goals, beliefs, and systems. The pattern of agricultural trade will, in the long term, reveal the production and processing advantages that both countries have.

Over the past two or three decades, trade between the U.S. and Mexico has been of increasing importance for all three North American nations in agribusiness and the other sectors. Mexico has a population and per capita income expanding faster than most nations—indeed faster than the U.S. Mexico has become the third largest trading partner for the U.S. behind Japan and Canada. In imports from the U.S., it surpasses Germany, France, Korea, and others that we view as major partners. According to recent U.S. government analysis, the two NAFTA trading partners should purchase close to $8.3 billion worth of agricultural products in 1993. If realized,
this would make NAFTA partners the United States' largest export market for the first time—surpassing Japan's $8.1 billion and the EC's $7.1 billion. This is a doubling in the market share for these countries in the past five years.  

Mexico is a net importer of food and agricultural products. They represent our fastest growing agricultural export market of any size. Last year, U.S. exports to Mexico totalled $2.9 billion. Imports from Mexico totaled $2.5 billion. Arizona, Texas, New Mexico, and California see as much as one half of that total flow through their ports of entry. We must remember several key ideas in these negotiations.

President Clinton has assured Americans that he will implement the agreement with a couple of conditions. Problems do exist, but both sides are working to reduce the challenges. Without GATT we would have lost many of our export markets to trade quotas from other countries. Remember over half of most commodities are exported outside the U.S. For NAFTA there are several points to consider including:

1) Only about 12 percent, or 57 million acres, of Mexico's land is arable. This is one half the size of California. In the U.S., over 20 percent of our land is arable. Mexico's climate ranges from desert to tropical. Ours is more temperate and therefore, can be used more effectively.

2) Over half of Mexico's crop land is located in the rain-fed central highlands, but rain is irregular. Irrigated land is a very small part of Mexico's agriculture.

3) In northern Mexico, production is concentrated in two important staples—corn and beans. Some diversification exists in crops similar to the Imperial Valley and Arizona, but growth will be limited by technology and capital.

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4) Mexico is stressing “food access,” not self-sufficiency as in the 1980s and early 1990s. This means that they must rely on increasing value-added imports of meats, vegetables, poultry, and food grains. With a population growing at over three percent, and incomes growing at twice our rate, Mexico will be one of the fastest growing U.S. markets for our value-added products.

5) It is interesting to note that 80 percent of U.S. agricultural exports are intermediate and consumer-oriented, high-value products. This includes horticultural, meat, and processed food products. This area has expanded three-fold since 1987.

Additionally, total U.S. gains in employment due to NAFTA are estimated at 27,000 jobs in all sectors. Clearly, there will be winners and losers as the tariffs in many areas decline over the next several years. President Clinton, Congress, and American farmers will undoubtedly watch this area closely.

Agribusiness persons, farmers, ranchers, and bankers are going to have to assess “cross-border” financing. They will need to speak Spanish as well as English and understand the impacts on individual customers.

Environmentalists, who have been concerned over this agreement, have begun to realize that with the agreement we can help administer the environmental problems on both sides of the border and for the whole North American region.

The New Competitive Financial Services Market

The financial market movements in the past three or four years have highlighted a number of issues which are affecting all agribusinesses, farmers, and ranchers. In Washington the Department of the Interior and banking and agriculture committees are working on many issues. They are considering implementation and amendment of the 1990 Farm Bill. The next credit and farm bill is now only one or possibly two years away. Also, next year the
need to meet mandated budget reductions and the constant threat of budget sequestration overshadows their work. This is complicated by the fact that a record number, over 120 new legislators and 3100 new executive branch managers, are rethinking government and its excesses.

As we continue to watch globalization unfold, we are witnessing the movement of strong economic and political forces that will profoundly affect the global economy. There are also changes happening in the financial arena that are making possible new markets and partnerships. Following the euphoria of democratic change will be painful economic and financial restructuring. We should recognize these added challenges to international development as opportunities.

This new world financial order will help continue the financial restructuring trends of the past five years. Agribusiness, cooperative, corporate, and government treasurers are discovering new, innovative, cost effective sources of capital through globalization of the capital markets. Individual nations are redesigning long-standing financial guidelines and plans into a world standard. This is directly affecting agriculture as it has the home mortgage industry, the automobile and equipment industries, and any market segment that requires large amounts of long-term capital. This year we can expect:

- Continuation of merger, acquisition, and divesture in agricultural industries. In the past three years, three of the top ten corporate restructures were agriculture-related, totalling over $35 billion.

- Additional impact of FIRREA on capital markets and financial institutions. For commercial banks, savings and loans, and the Farm Credit System, FIRREA will increase the need for capital, additional regulation, and changed accounting practices and will provide a number of additional challenges.

- Continued restructuring of the banking industry with tremendous impact on regional real estate and land markets. FDIC recently reported large
losses for many institutions from real estate. Land values near urban areas have fallen over 50 percent from the highs. While values are now recovering, collateral values remain less than many loan values. Most of these losses come from the Southwest and New England. California has had its share of problems in this regard.

• More efficient use of capital. Farmers and agribusiness will focus on reducing financing costs and cash outlays as ways to increase returns. This will be very important to the more mature segments of the industry. Financial service institution executives and bankers are being able to sell more kinds of securities at lower spreads than in the past decade.

• Increased securitization of debt as LBOs, continued high yield or junk bond financing, specialized trusts, and financial restructuring to continue to concentrate on the cash flow aspects of business and government.

• Increasing emphasis on asset and liability management to insure that changes in interest rates and international currency markets contribute positively to the “basic core” business.

This impacts all of the lenders to agriculture including commercial banks, independent banks, insurance companies, the farm credit system, machinery credit companies, and other nontraditional lenders. These other lenders are taking away loans and hurting the banks’ market share. While USDA and others do not track totals of unregulated entities, this may be a reason that credit totals have not grown in 1992 and the first part of 1993.

In 1994, agribusiness and environmental resource managers will depend upon increasingly sophisticated, flexible, and affordable financial options. The farm credit system, independent bankers, and commercial bankers are changing to meet the needs of this international environment. This year investors are investing in “Farm
Credit" paper with virtually the same confidence given to the U.S. Treasury Securities. Spreads have narrowed as the Farm Credit problem of the 1980s is behind us. Yet, we need to remember those lessons as the world is still a challenge for lenders.

(5) You Can Make Some Money if You Understand the Increasing Role of High Value Products in Agriculture and Agribusiness. High-value products account for more than 80 percent of the nearly $300 billion of world agricultural trade. In the U.S., we have not focused on developing the value of these products. Processed products comprise about 60 percent of these products. Processed livestock products alone represent 24 percent of the value of world food and agricultural trade. This category is larger than the value of all bulk products which represent 19 percent. Processed grains and oilseeds and horticultural products are also increasing in importance.

In agriculture we must remember that high-value products have a higher multiplier than do bulk products. A dollar's worth of high-value agribusiness exports generates about $1.70 compared to $1.50 for bulk products for our economy. Today over 55 percent of America's agricultural export jobs are the result of high-value products. No wonder the Japanese and the Europeans focus on their own high-valued exports. Categories of products such as mineral waters, horticultural specialties, and some cheese categories are dominated by imports because they have developed the brand and customer loyalty. Americans are now focusing in this area, but our efforts need to be expanded. Modern refrigeration, transportation, and storage systems allow us to be very competitive in these areas. We can ship, truck, or fly products anywhere in the world in a matter of days.

In California and the U.S., agricultural economic and financial fundamentals undergird long-range growth in agricultural lending and continue to be strong, but conditions are changing. Agricultural bankers and borrowers need to be prepared. Land prices around the country are recovering, and as a result, most farm balance sheets have strengthened in the past 36 months. This trend
should continue as total real estate assets should reach $660 billion in 1994\textsuperscript{5}, a $15 billion increase over this year. Old stocks of excess commodities were reduced by the drought of the late 1980s, the flood of last year, and strong export sales. However, bumper crops in some areas in 1992/1993 have analysts looking ahead to the basic imbalance that caused the severe problems in the early 80s. World supply and demand imbalances will remain a question for the late 1990s.

IV. Farm Credit System Update

Now that we have touched on the rule changes for farming and agricultural finance and the globalization of agribusiness trends as we head into the 1994 crop year, I would like to get more specific and give you a progress report on the Farm Credit System Assistance Board and its activities since I left in 1990. It sunsetted this fall as Congress mandated. This is one of the only federal programs to "work" in a financial restructuring effort. It issued over $1.27 billion in new debt, some of which is repaid today.

Replacing the Assistance Board is a new Farm Credit Insurance Corporation headed by an agricultural banker, the Honorable Gary Byrnes. Today, it is functioning to assist the farm credit system and its institutions. It will work with farm credit institutions to develop financial recovery plans, certify those which are eligible, and monitor those institutions which must seek federal financial assistance.

As the new head of Farm Credit Administration, Billy Ross Brown is expected to take a new direction at Farm Credit. Mike Dunn is the new director at FmHA and will focus on first time farmers and restructuring troubled farmers. The direction change will, hopefully, help the overall ag credit situation.

Current forecasts suggest that the total farm debt will reach $144 billion in 1994,\textsuperscript{6} up only $4 billion from 1993.

\textsuperscript{5} Farm Financial Conditions Review, November 1993, page i.
\textsuperscript{6} IBID, page i.
Slow loan growth appears to be a national trend affecting all lenders as farmers and businessmen are reluctant to take on new debt. In Arizona and California, the system is healthy and redirected toward its basic mission of helping farmers and ranchers. Yet looking ahead, independent bankers and the farm credit system may be facing major challenges and must work together to solve some of the industry’s problems.

The agricultural banks, including farm credit institutions which prosper, must continue to take many positive steps. These include balancing their assets and liabilities, minimizing their exposure to fluctuating interest rates, and competing for market shares in today’s financial marketplace.

During the six years of the assistance program for system institutions, investor confidence has increased, and spreads between system securities, and treasury obligations of comparable maturities have narrowed. Though interest rate spreads and the shape of the yield curve may not be as favorable in the future, the management techniques are vastly improved from the mid 1980s.

Although problems exist, the mechanism provided under the law is working, and the system institutions are working individually and collectively to make their organization an effective, responsive lender. I am confident that the Farm Credit System will continue to make progress in its financial revitalization efforts and will continue to be a leader in agricultural lending.

All four certified Banks met the regulatory seven percent capital adequacy requirements well ahead of schedule and continue to build capital reserves. All have positive retained earnings. One has made provision for repayment and others have been considering similar plans. This is eleven years early.

Working through the crisis of the mid-1980s took more than just a rebound in the farm economy. It required the cool heads of directors, management, government officials, and loan borrowers. It meant a willingness to make an honest assessment of strengths and weaknesses, and the discipline and determination to make the hard choices necessary to put the income statement in the black again.
V. Farmer Mac

Farmer Mac continues to make progress, but it is slow considering its potential. For the agricultural banks, Farmer Mac still makes sense as a way to access the capital markets for agricultural loans. I continue to urge the Farm Credit System, agricultural banks and others to work together. The financial globalization also created Farmer Mac. In 1992 and 1993, several more pools were completed, assuring at least two or three more years of operating funds for Farmer Mac.

We don’t know how Congress will address this issue in the next farm bill in 1995, but at this point, several issues need to be answered. They include the following: How will Farmer Mac’s intervention in the marketplace affect interest rates and available credit to farmers and ranchers? How will lenders react to “the new kid on the block?” How many lenders will find Farmer Mac an attractive tool to strengthen and enlarge their agriculture loan portfolio?

VI. Unique Credit and Profitability Issues for California and Arizona

We will continue to face some unique challenges in California and Arizona which U.S. agriculture does not face.

- **Water Issues**—Cost of water and availability are two areas of increasing uncertainty in both states. While some farmers get water at a low rate, many farmers do not. We must calculate carefully our usage and cost to decide if we can continue to produce and process our traditional crops including citrus, cotton, and other fruits and vegetables.

- **White Fly and Insects**—Today’s urban-oriented consumer and voter does not understand the issues related to the use of pesticides and control of pests and insects. Thus, agriculture cannot attempt to solve its insect problems in the same way. In the
1993 crop year, we made significant progress. In the future we will have to focus on control of the insects and pests which can cause devastation to our crops and livestock.

Use of pesticides and herbicides will continue to be an increasing concern by the urban dwellers in our areas. The new laws and environmental options will cause agribusiness to adapt or face a dramatic loss of cash flow in some years.

- **Increasing High Value of Land**—In both states real estate values continue to make land values high in relation to the cash flow. This will challenge both the banker and the producer to insure that the highest value is derived off the land. Property taxes will continue to be a problem close to the increasing urban areas. Today people commute 50 to 100 miles a day to work. As our urban areas expand, we will have to shift to higher-value products or seek new lands where more traditional crops can produce the cash flow to pay the property taxes. The $15,000 ag land is now worth less, but it is still above its cash flow value from agriculture.

- **Concerns by the Urban Dweller about Agriculture**—As urban voters have become distant from their roots on the farm, we are beginning to see major shifts in voter and legislature positions. This hurts agriculture—in water debates, pesticides, environmental debates. We need increasing focus on ways to improve our communication with urban voters.

**VII. A Bright Future If You Adapt to the Changes!**

In 1994, agribusiness and agricultural lenders and borrowers face a different era in agricultural credit. For some banks, this era shows us that we have a positive environment for banking with earnings at record levels. In contrast, many feel they cannot get credit to continue
in basic and much needed business in agriculture. There remain credit and investment questions and needs throughout the global agricultural system.

Six years ago a number of us stood on the White House lawn as former President Ronald Reagan closed the Summit with Chairman Gorbachev. This was long before the onset of the amazing events we have been watching in recent years. President Reagan gave prophetic remarks about a quiet revolution sweeping the globe in which Californians and Americans could be “an energetic lot, people of enterprise.”\(^7\) He talked about the financial challenges ahead, and a new global economy. He highlighted that we are seeing the power of economic freedom spread around the world. Freedom is the right to question and will change the established way of doing things. It is this continuing economic, financial, and technical revolution of the marketplace which assures we will see change. It is the understanding that allows us to recognize shortcomings and seek solutions. It is the right to put forth an idea, scoffed at by experts, and watch it catch fire. It is the irresistible power of unarmed truth. Here in the Southwest, we are implementing this vision. Bankers must remember that the future will be different and make changes to assist us all. 1994 should be a successful year. We must watch closely and work on the basics of sound borrowing and lending. We need to adapt the rules for our portfolios and our operations. The financial and economic environments demand it.

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Appendix A: Owner Questionnaire

The task force from the American Banker Association recommends that the borrower and operator be asked the following questions:

1. Does the borrower or operator use materials which may be hazardous? If so, the banker should ask for a detailed description of each material and how the material is being used and disposed of safely.

2. Does the debtor generate hazardous or other wastes as a by-product? If so, ask the borrower to give a detailed description of each waste by-product.

3. The borrower or operator needs to be asked if he has any knowledge of anyone depositing, storing, using, manufacturing or generating hazardous materials or wastes on the property site. If so, where?

4. The borrower and operator need to be questioned to see if the property was ever used as a land fill, dump, or for the disposal of any chemicals, compounds, or hazardous material and wastes. If so, the lender needs to get a detailed description of the precise location, dates used, length of time used, the items disposed, and the methods of disposition.

5. Specifically, the borrower and operator needs to be asked about asbestos use in the construction of the buildings and any additions.

6. The potential debtor needs to questioned if he or his employees have disposed of any solid or liquid waste on the property or other locations.

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8 American Banker's Agricultural Lenders Guide to Environmental Liability.
7. One needs to request a list of the substances which are discharged into the atmosphere and question any hazardous or odor causing vapors.

8. The borrower and operator need to be solicited concerning all substances stored on the premises. This includes gasoline storage tanks and other fuels. Experts generally recommend that the use, age, and capacity of each tank be noted. Also, any indication of leakage should be noted.

9. The potential debtor needs to be questioned concerning all substances discharged into surface or subsurface water on the property or into any sewage or drainage systems. This is particularly important for agricultural and chemical oriented businesses. The water quality issues are an important issue for all California and Arizona businesses.

10. The current owner and operator should be queried concerning past owners and what businesses they were engaged in for the past 75 years.

11. The potential debtor needs to be asked, “Has any governmental agent responsible for public health, safety or environmental hazards contacted the owner or operator?”

12. The borrower or operator should be asked to describe the type of heating, cooling and ventilating systems used and if any hazardous materials are involved.

13. The potential debtor should be questioned whether the property has been used for mining. This is particularly important with Mercury, and other minerals that were mined in part using hazardous materials.
14. The borrower or operator must provide a list of the location of all wells on the property. For those wells that have been plugged or sealed, the date of closing and manner of closing is important.

15. The applicant should also be questioned regarding adjacent and contiguous property. The type of businesses is important in determining whether they dispose of chemicals, insecticides or pesticides. Additionally, are there any landfill or lagoon disposal facilities for liquid or solid waste nearby? Has the company ever used these facilities?

The information derived from these questions may indicate potential environmental hazards or risks which are:

° present on the site;
° currently posed by the borrower's operation;
° or could arise in the future.
The Risk and Credit Environment Faced by Agricultural Borrowers

Steven C. Blank, Jerome B. Siebert and T.J. Wyatt

I. Introduction

Economic and natural factors have both contributed to the evolution of a new risk environment in which California's agricultural producers must operate. Borrowers believe that a "credit crunch" has developed in agriculture in that producers are having more difficulty in gaining access to the credit they need (Blank 1992a, Western Grower & Shipper). As a result, there is potential for significant changes in resource allocation in the state as the agribusiness sector adjusts its approach to risk management. These potential adjustments have wide-ranging economic and social policy implications for California.

In the past, risk management tools have been under-utilized in California because they did not meet the perceived needs of the state's agribusiness people. For example, given a moderate climate, irrigation control of

The authors thank Robert C. Thompson, Jr., Cal Poly, San Luis Obispo for his review.
water, and broad options for diversification, California agribusiness peoples' concern for production risk has been relatively low. But recent events are beginning to challenge those attitudes.

For example, a freeze, a six-year drought, and farm lenders' new attitudes toward these risks have combined to make production risk exposure a renewed concern of agribusiness people in California. In December 1990, a record-breaking freeze significantly damaged a number of crops in many regions of the state. Also, for the first time in the history of the state's water project, all water deliveries to agriculture were suspended during 1992. And on average, the federal Central Valley Project made just 25 percent of deliveries to agriculture. Borrowers think these events have already caused agricultural lenders to weigh production risk more heavily in their lending decisions. Many lenders now include a water supply questionnaire in their loan application process, and borrowers who have been creditworthy in the past may be turned down if they do not have a secure water supply.

II. Objectives and Procedures

The general objectives of this chapter include identifying changes in attitudes and operating procedures concerning risk management and credit in California agribusiness, assessing the general trends in demand for credit by producers, and outlining the resulting policy implications.

Specific objectives addressed include:
1. Identify changes in operating procedures and strategies of California producers caused by recent events.
2. Identify changes in attitudes towards risk management methods in California.
3. Determine why risk management tools have been under-utilized in California.
4. Identify any differences in risk attitudes and/or operating procedures between growers who are land owners (and/or have adequate bor-
rowing capacity) versus tenants (or growers with limited borrowing capacity).

5. Identify the sources of demand for credit by specifying uses of credit in agricultural firms.

6. Describe the potential for growth in production of major commodities to provide a forecast of future demand for agricultural credit.

7. Describe how borrowers view credit and the lending process now.

Hypotheses regarding the effects of the increase in perceived risk in California agriculture are tested with data collected through surveys. The hypotheses regarding operating strategies outlined below are derived using standard portfolio theory.

To collect empirical data to test the hypotheses, a broad-based mail survey was used to elicit information from farmers, ranchers, and other agribusiness firms in California. Personal interviews with producers, agribusiness managers, and lenders supplemented the mail survey. The selected sample of producers represented a cross section of the state’s commodities and geographical regions. Over 600 people responded, providing the results reported later in this chapter. Before presenting the results, we will present the theory explaining producer behavior.

III. Producers' Enterprise Selection, in Theory

A person deciding whether to produce agricultural enterprises must first identify the opportunities available in their particular market. Those opportunities can be evaluated using theoretical analysis methods similar to those used by portfolio managers. This section summarizes the implications of such an analysis concerning production decisions and the effects on production of an increase in risk.¹

¹ Interested readers can see the paper by Blank (1992b) for the detailed analysis leading to the results reported here.
Enterprise Selection

To begin, if a situation existed in which no leasing of land were possible, for whatever reason, only land owners could produce crops. In this situation, each land owner would choose to produce the crop portfolio which best suits his desired level of tradeoff between risk and returns. This leads to the production of different enterprise portfolios by people with different profit expectations or risk attitudes.

In an alternate situation in which leasing land is possible, the opportunity set available to growers is altered. Leasing in land enables tenants to become producers.

When cash leasing is possible, all land owners who have the same returns expectations will produce the same enterprises although the composition of their selected portfolios will vary with their risk attitudes. The portfolios they select to produce is a function of their personal risk preferences and consists partly of the “optimal” portfolio enterprises\(^2\) and partly of the risk-free asset (i.e., cash leases on a portion of land owned). Therefore, even though two growers in the same market may have the same opportunities and expectations, they will still choose different portfolios if they react differently to risk. The portfolios of these growers differ in the percentage of land used in production versus the amount leased in or out.

Differences in the land holding (and/or borrowing capacity) status of owners and tenants alter the production opportunities available to tenants (or growers with low borrowing capacity) and therefore, the resulting enterprise decisions. Tenants have no land to lease out; therefore, they can only lease in land. This means that the production opportunities available to tenants are a combination of some production opportunities available to owners and some less risk-efficient opportunities.

A tenant would select an enterprise portfolio in the same manner as owners. If the prospective tenant

\(^2\) The “optimal” portfolio of enterprises are those products which, as a group, have the best tradeoff between return and risk, given current market prices and yields for all products. This combination of enterprises will change over time with market conditions.
chooses to undertake a lease and has adequate working capital, then the tradeoff between risk and returns identifies the portfolio to be produced. In general, the higher the level of risk a tenant willingly accepts, the more likely the tenant will produce the same enterprises as an owner with similar risk preferences: the crop portfolio which has the best risk return tradeoff for that market. On the other hand, if a tenant prefers lower levels of risk, he will likely produce a crop portfolio which is less risk efficient than that produced by owners (a more efficient portfolio offers the same returns at lower levels of risk).

Effects of Increased Risk on Producers' Enterprise Selection

An increase in production risk, either real or perceived, changes the risk/return tradeoffs available to all producers, meaning that producers must accept a higher level of risk for each level of returns. This new set of production opportunities triggers a three-stage reaction which may take several years to complete. First, it creates new production opportunities encouraging land owners to lease out more land, rather than producing on it themselves. Second, the lower profitability of these production opportunities is not high enough to attract tenants in sufficient numbers to enable owners to lease out all the land they wish, thus leasing rates fall until they reach a new equilibrium rate, which establishes new production opportunities. Finally, the new production opportunities are more profitable, causing land owners to lease in more land to use in the production of a less risky portfolio of enterprises.

The sub-sections below discuss in more detail the effects of increased risk on production decisions are discussed in more detail for land owners and tenants. To illustrate the effects of land holding status, as well, the remaining discussion will examine the case of an owner and a tenant with exactly the same expectations concerning gross returns and with identical risk attitudes. It is

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3 Production risk is one source of what finance specialists call "business risk." Business risk and financial risk are the two components of a firm's "total risk" (Van Horne).

46
hypothesized that increased risk affects production
decisions both directly and indirectly through other
factors, as described below.

i. Direct Effects of an Increase in Perceived Risk

The first question addressed is what direct effects
do perceived increases in risk levels have on production
decisions of owners and tenants? To begin it is assumed
that a land owner and tenant each face the same leasing
rate and that both people have identical risk attitudes. In
this situation, the land owner and tenant would both
select the same crop portfolio. The portfolio requires that
the land owner use all of his land for production.

If the perceived level of risk increases, production
decisions of the owner change significantly. A “transition
period,” which could be brief or last years, begins as a new
set of production opportunities and becomes relevant for
owners. The owner’s profitability decreases. During the
transition the new selected portfolio requires the land
owner to use a smaller portion of his land for production
of the enterprises in the new optimal portfolio, while
leasing out the remaining acreage. The composition of the
new optimal portfolio is clearly more risky than that of
the original portfolio. Hence, owners respond to increases
in risk by producing a more risky combination of crops,
but they produce on fewer acres during the transition
period.

The tenant will also change his cropping plans
when risk levels increase. During the transition period
the tenant’s production opportunities become a combina-
tion of risk efficient and inefficient crop portfolios, and the
tenant’s profitability decreases. The new portfolio se-
lected by the tenant may have nearly as much risk as that
of his original portfolio although it will entail less risk
than the new combination of crops produced by land
owners.4

4 Just like landowners, tenants will react to an increase in risk by trying
to reduce the total risk of their selected portfolio. Unlike landowners,
tenants cannot do this by “investing” land in the risk-free alternative to
production—cash leasing land out. Therefore, tenants must produce a
less risky combination of crops to restore their desired return-risk
tradeoff level.
Another difference between the new selected portfolios of the land owner and tenant during the transition period is in their degrees of risk efficiency. Since we assume that the two decision makers have identical risk preferences, the tenant would choose the new portfolio produced by land owners if he could, but he cannot because it requires leasing out land which he does not have. Due to differences in their ownership control over land, production efforts of the two people generate different portfolios: the owner produces crops in the optimal (risk efficient) portfolio, and the tenant produces his second best alternative which is a less efficient portfolio. In this sense, the difference between the risk-adjusted returns from the different portfolios represents an opportunity cost to tenants and a benefit to owners.

In response to the reduced profitability offered by the new production opportunities, tenants’ demand for land would decline in the long run, causing cash leasing rates to decline which, in turn, would change production plans as the transition period reaches a new period of equilibrium. If leasing rates decrease, production decisions of the owner change again. A third set of production opportunities become relevant for owners, and the owner’s profitability decreases further. The new selected portfolio for the owner in this case requires that the owner produce on more of his land and possibly lease in additional land.

The tenant in this example will also want to produce the portfolio selected by owners with leasing rates at this level; however, little land will be available in the new equilibrium. Increased demand for land by owners leaves little land for tenants unless cash lease rates increase.

In summary, the portfolio model leads to a number of hypotheses regarding producers’ operating procedures and strategies. We expect that a transition period begins with a perceived increase in risk caused by the drought, regulatory changes, and other factors. During what could be a multi-year period of transition, the following producer operating strategies are hypothesized: (1) acreages of “risky” crops will increase; (2) more risky cropping patterns will lead to increased demand for risk management tools; (3) more acres will be fallowed and/or
leased out by land owners; and (4) water and other inputs will be concentrated on fewer acres to raise the return per acre on the land in production. The transition period will lead to a new period of equilibrium as the following hypothesized trends are observed: (1) cash leasing rates per acre will decline; (2) less land will be leased out (thus limiting entry into farming by tenants); (3) farm land values will decline; and (4) land will be forced out of agriculture and developed due to agricultural income shortfalls, unless farm land prices fall enough to make less profitable/risky crops viable again. Ultimately, both owners and tenants will produce less risky combinations of crops compared to the crops grown before the increase in risk. Until these trends are observed, the transition continues and producers will face numerous short-term constraints, such as those described in the next subsection.

ii. Credit Limit Effects

An increase in the perceived level of production risk leads directly to a reduction in the amount of financial risk (measured as debt levels) which a firm can take on without raising its total risk exposure (Van Horne). Therefore, higher production risk will either cause interest rates charged to the firm to rise or the amount of credit extended to the firm to decrease (Miller et. al., Khoju et. al., Pederson et. al.)

Credit limits tightened by an increase in risk levels can significantly affect portfolio choice and its risk

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5 This means that farms with water shortages, for example, are expected to give the full amount required for normal output per acre on fewer acres rather than putting less efficient amounts on all available acreage. Also, it is expected that growers will, to the extent possible given agronomic and management capabilities, shift out of water-intensive, low-value crops such as alfalfa, cotton and rice and shift into higher-value, less water-intensive crops such as processing tomatoes. However, growers of perennial crops will face significantly more constraints on their ability to make adjustments to their production portfolio and, therefore, will be less able to adjust their risk exposure in the short term.

6 This assumes that the increase in risk is detected by the lender. If the lender is unaware of the increase in the potential for default, but the borrower is aware of that change, Collins and Gbur have shown that the producer might “plunge” by borrowing as much as possible to take the big gamble seen as the only way to stave off approaching failure of the firm.
efficiency. We illustrate this point by using the case of an owner and tenant who would choose the same portfolio if possible. If the owner needs to borrow additional funds to lease in land and expand production, he has the equity in his land to serve as collateral, giving him borrowing capacity. The tenant (or fully leveraged land owner), however, faces a much greater chance of being unable to borrow the full amount needed because he needs more funds (a tenant is leasing in all the land to be used in production, not just part of it like the owner) and has no equity in land to serve as collateral, hence, he may represent a more risky loan to the lender. If the tenant cannot borrow all the funds needed to produce the desired portfolio, he will select a new portfolio for which the credit constraint is no longer binding. All production opportunities more profitable than the highest returning fundable portfolio are not available to the decision maker. This means that credit constraints will, at some point, truncate producers’ production opportunities. For tenants (or growers with low borrowing capacity), the lower their credit limits, the more likely they will have to select a less efficient portfolio. Also, any change in the selected crop portfolio resulting from credit limits reduces expected returns. Such a reduction can be viewed as another opportunity cost of lacking land wealth or borrowing capacity and an opportunity benefit for possessing land wealth.

IV. Risk Attitudes

This section summarizes the survey results and explains the interpretation for the first four specific objectives listed earlier. Results for the remaining objectives are presented in later sections.

Objective 1

To identify changes in operating procedures and strategies of California producers caused by recent events, the survey of farmers included the following questions: (1) Have you increased your total acreage of high-value produce during the past three years? (2) Do you believe that producing more valuable crops requires more atten-
tion to risk management? (3) Have you fallowed and/or leased out more acreage over the last three years than you do normally? (4) When fallowing some land, do you use more water and other inputs on the land remaining in production? (5) Have cash leasing rates per acre declined over the past year or two? (6) Have you decreased the amount of land you leased out over the past year or two? (7) Have farm land values declined in recent years? (8) Has farm land been developed into non-agricultural uses in your area recently? (Table 1).

In general, the results support producer behavior hypothesized as typifying a "transition period" which has begun but shows no signs of ending in the near future. The level of positive responses to the first four questions reported in Table 1 indicates that both land owners and tenants are reacting to the new risk environment as hypothesized by the theoretical model. If the transition period were complete, responses to the last four questions in Table 1 would have been much more positive. This means that the four trends hypothesized as signalling the end of the transition period and the beginning of the new equilibrium are not evident yet but are expected to develop in the future.

To cross check the responses to the first question in Table 1, published acreage data from the entire state

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**Table 1. Producers' Operating Strategy Changes**

<table>
<thead>
<tr>
<th>Transition Period Begun</th>
<th>Owners Yes (percent)</th>
<th>Tenants Yes (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased total produce acreage in past three years?</td>
<td>21</td>
<td>27</td>
</tr>
<tr>
<td>Crops require more risk management?</td>
<td>58</td>
<td>61</td>
</tr>
<tr>
<td>Fallowed and/or leased out more acreage recently?</td>
<td>34</td>
<td>-</td>
</tr>
<tr>
<td>Concentrating water and other inputs on fewer acres?</td>
<td>43</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trends Ending Transition</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash leasing rates declined recently?</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Decreased the amount of land leased out recently?</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>Land values declined recently?</td>
<td>28</td>
<td>-</td>
</tr>
<tr>
<td>Farm land developed out of agriculture recently?</td>
<td>15</td>
<td>-</td>
</tr>
</tbody>
</table>
(California Department of Food and Agriculture) were evaluated to detect recent trends. As shown below for a sample of risky crops, acreages have increased in recent years.

<table>
<thead>
<tr>
<th></th>
<th>1988</th>
<th>1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1,000's acres)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes (processed)</td>
<td>226.1</td>
<td>312.0</td>
</tr>
<tr>
<td>Tomatoes (fresh)</td>
<td>37.5</td>
<td>40.0</td>
</tr>
<tr>
<td>Carrots</td>
<td>51.1</td>
<td>56.0</td>
</tr>
<tr>
<td>Peaches</td>
<td>53.7</td>
<td>54.1</td>
</tr>
<tr>
<td>Strawberries</td>
<td>17.6</td>
<td>21.1</td>
</tr>
<tr>
<td>Almonds (shelled)</td>
<td>407.0</td>
<td>411.0</td>
</tr>
</tbody>
</table>

Reviewing the details of responses to question 1 provides additional support for the general conclusion that growers have shifted more acreage into high-value produce as hypothesized. Landowners, for example, responded to the question by checking the multiple-choice answer categories in the following way: (a) yes, acreage increased by more than 25 percent—9 percent; (b) yes, acreage increased by 1 to 25 percent—12 percent; (c) no, acreage is unchanged—72 percent; (d) no, acreage decreased by 1 to 25 percent—7 percent; and (e) no, acreage decreased by more than 25 percent—0 percent. Approximately three times as many owners have increased produce acreage as have decreased it. The reason for the high number of “unchanged” responses is that many growers continue to have no acreage of high value produce crops.

Detailed responses to other questions also provide support for the hypothesized transition period. Landowners indicated a strong shift toward leasing out more land (34 percent response to question 3) rather than leasing in land (7 percent response to question 6). On the other hand, leasing rates per acre are fairly stable: 12 percent of owners have lowered their cash charges per acre recently (question 5), while only 7 percent have raised them, with the remaining 81 percent making no change in rates. Responses to questions 7 and 8 do not show evidence of the transition ending soon. Land values have remained stable in recent years: 28 percent of owners reported decreased values, and 32 percent re-
ported increased values. Land is not being developed out of agriculture any faster recently than it has been over the past decade.

**Objective 2**

To identify changes in producer attitudes toward risk management methods in California, we posed the following questions: (1) Is risk included in management decisions? (2) Do risk variables enter into plans and decisions about enterprise selection and/or resource use and management? (3) Were producers able to plan contingencies for the drought and/or freeze using existing risk management strategies? If not, what did they do? (4a) Did the freeze and/or drought alter producers’ attitudes toward or estimates of risk? (4b) If so, how will their risk management efforts be affected in the short-run? In the long-run? (5) Has the “credit crunch” reduced the amount of credit available to producers? (6) Have producers changed crops to reduce their credit needs? (7) Are growers satisfied with the risk/return tradeoff available on the crops they produce currently? (Table 2).

As a whole, the responses reported in Table 2 indicate that producers are now very aware of risk, yet

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**Table 2. Producers' Attitudes Toward Risk**

<table>
<thead>
<tr>
<th>Risk used in decision-making?</th>
<th>Owners</th>
<th>Tenants</th>
<th>Yes (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk used in enterprise selection?</td>
<td>31</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Risk contingency plans?</td>
<td>23</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Drought/freeze altered risk attitudes?</td>
<td>51</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>New risk plans developed?</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Credit crunch reduced credit limits?</td>
<td>29</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Changed crops to reduce credit needs?</td>
<td>18</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Satisfied with current crops' risk/return tradeoff?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk averse growers ($\gamma^* &lt; \gamma_i$):</td>
<td>71</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Less risk averse growers ($\gamma^* \geq \gamma_i$):</td>
<td>83</td>
<td>78</td>
<td></td>
</tr>
</tbody>
</table>

*Note: $\gamma^*$ is the risk aversion coefficient for growers of the optimal portfolio, $\gamma_i$ is the coefficient for respondent i.*

53
over half were unprepared, to some degree, for the shocks of the drought, freeze, and "credit crunch." Forty percent of land-owning respondents indicated that they are currently considering risk in their decision making. Yet, many producers are apparently uncertain how to incorporate risk into their management plans. For example, the most obvious place risk should be considered is in enterprise selection, yet only 31 percent of owners are doing so. Those respondents not considering risk when selecting enterprises often explained that they produced perennial crops, so they were "not selecting enterprises each year." Exhibit 1 shows the varied ways in which producers are considering risk in their operations. Only 23 percent of owners claimed to have active contingency plans for major risks such as the drought or freeze, indicating another area of weak risk planning. Question 4 results show that 51 percent of owners now have a better appreciation for the need to consider risk in management planning than they did before the drought began. Yet, only 25 percent have developed new risk plans since that time. This indicates some confusion on the part of respondents because 29 percent of owners replied positively to question 5, meaning that nearly one-third feel the effects of the new credit environment. The most often cited example is a shift in enterprises to reduce credit needs by considering the timing of cash flows from particular enterprises in their "portfolio" (question 6). The responses to question 7 indicate that land owners are generally satisfied with their degree of risk exposure; however, the confusion evident in responses to other questions raises the issue of whether growers truly understand the concept of risk and its management.

One question from the survey addressed the issue of ranking various sources of risk as they affect profitability. The sources of risk itemized in the question (as well as some of the more common "other" responses) encompass natural phenomenon such as weather and temperature variability, market variability in prices and competition, as well as government intervention and regulation. We asked producers to rank the sources of risk in order of their respective effect on profitability, where a 1 denotes foremost concern and an 8 denotes least concern (Table 3).
There are 12 sources of risk tabulated in Table 3, each receiving a possible rank of 1 through 8. Percentages associated with each rank are reported, as well as

<table>
<thead>
<tr>
<th>Table 3. Sources of Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources of Risk</td>
</tr>
<tr>
<td>Disease</td>
</tr>
<tr>
<td>Drought</td>
</tr>
<tr>
<td>Floods</td>
</tr>
<tr>
<td>Freeze</td>
</tr>
<tr>
<td>Input price</td>
</tr>
<tr>
<td>Labor cost</td>
</tr>
<tr>
<td>Output price</td>
</tr>
<tr>
<td>Pests</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Govt. Regs</td>
</tr>
<tr>
<td>Comp/Trade</td>
</tr>
<tr>
<td>Weather</td>
</tr>
</tbody>
</table>

Note: The first column lists a source of risk. The next eight columns list the percentage of respondents that ranked that source of risk as 1st most important, 2nd, etc. The percentages in each row are calculated on the total number of responses received listed in the last column.

the total number of respondents ranking that particular risk source. In evaluating the producers’ rankings of the various sources of risk, only the first eight risk sources will be considered. The latter four (Other, Government Regulations, Competition and Trade, and Other Weather) will not be considered as the total number of responses to these categories is inadequate for analysis.

Based upon the information contained in Table 3, the sources of risk deemed most important by producers of all types are market (price) attributes followed by adverse variabilities in nature. This may explain the preferences for certain risk management tools discussed in the next section.
**Exhibit 1.** Responses to Question: Do risk variables enter into your plans and decisions about enterprise selection and/or resource use and management?

<table>
<thead>
<tr>
<th>No. of Responses</th>
<th>Nature of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>Risks considered in everyday and long-range plans</td>
</tr>
<tr>
<td>25</td>
<td>Changed management practices</td>
</tr>
<tr>
<td>21</td>
<td>Changed cultural practices</td>
</tr>
<tr>
<td>15</td>
<td>Diversify operation</td>
</tr>
<tr>
<td>8</td>
<td>Change from high profit to low-risk crop</td>
</tr>
<tr>
<td>7</td>
<td>Limit exposure to regulations and lawsuits</td>
</tr>
<tr>
<td>5</td>
<td>Changed labor practices</td>
</tr>
<tr>
<td>4</td>
<td>Change marketing method</td>
</tr>
<tr>
<td>4</td>
<td>With tighter profit margins, can withstand fewer loss yrs</td>
</tr>
<tr>
<td>23</td>
<td>Other</td>
</tr>
</tbody>
</table>

**Sample Comments of Individuals:**

- Switched from grain corn to silage corn because of low grain prices. Gone to seed crops because of forward contract availability.
- Vegetable farmer said he modifies his planting because of susceptibility of different fields to flooding (doesn’t plant by the river in the rainy season). Switched out of dry beans and sugar beets because of low prices.
- Planting locations determined by susceptibility to flooding. Try to keep about the same acreage in each crop and yields high to minimize the effect of price risk.
- Would not plant almonds in his riverbottom land due to frost. Has moved out of peaches into almonds due to price fluctuations in peaches.
- Grows almonds because they are not perishable and they are easy.
- Risk is why they are diversified even though it would be easier to specialize.
- Would like to diversify even more. Has drilled wells to reduce risk.
- Yields tend to be steady in lima beans. Forward contract in broccoli seed removes much risk.
- No longer grows rice because cost of production increased while price went down. Peach market has been good and contracts are available.
- California must move into high value and low water use crops. He will lower his alfalfa and row crop acreage.
- Uses labor contractors when timeliness is a factor.
- Grows more and more permanent crops due to high land values but tries to find crops with low labor requirements.
- Prefers commodities that can be insured. Consider availability of long-term water supply.
- With permanent crops, enterprise selection is hard to change, so risk enters into cultural decisions like spraying.
- Chose early-season tomato varieties. Popcorn is harvested earlier than grain corn, so they plant popcorn.
- Chose tomatoes because of contracts. Switch between wheat and saflower because of price. Chose rice because of the government program.
- Cotton has stable yields and the government program.
- Sugar beets show consistent returns. Planted popcorn and sunflower because they fit into the government program.
- Moved out of sugar beets because of disease. Stick with grain because of the equipment they own.
However, before looking at risk tools, it is interesting to note how agribusiness firms view risk compared to individual producers. During interviews, managers of 26 agricultural cooperatives were asked about the risks their organizations faced and how the cooperative managed these risks. Weather was the most commonly mentioned risk with 92 percent of the respondents listing it. Nearly two-thirds of coop managers, especially those from cooperatives dealing with fruits and nuts which must maintain quality standards, also mentioned pests and disease.

Almost 90 percent of the coop managers cited government regulations as the second most commonly mentioned risk. When asked to specify the two most important sources of risk, one half of the managers mentioned regulations, whereas weather was noted by just over one-third. This underscores a significant difference between producers and agribusinesses: firms consider government regulations to be a major source of risk, but individuals do not. Regulations impacted livestock cooperatives harder than other commodities with all dairy and the one poultry cooperatives stating that regulations were one of the most important sources of risk to the cooperative. Regulations also seem to increase risk for smaller cooperatives more than for larger ones. Of the smallest coops (those with less than 100 members), 75 percent mentioned government regulations as one of the two most important sources of risk and, 60 percent of the cooperatives with between 100 and 400 members agreed. In contrast, 29 percent and 40 percent of the two groups of larger cooperatives listed regulations as the most important sources of risk.

A third group of risks that cooperatives face, including input and output price variability and labor costs, was mentioned by 54 percent to 62 percent of the respondents. As would be expected, supply cooperatives are more concerned with changes in input prices while cooperatives engaged in marketing care more about changes in output prices. Interestingly, labor costs were not ranked in the two most important sources of risk by any cooperative. Finally, 23 percent of the cooperatives, all medium-sized, mentioned environmental concerns
among the risks they face and 19 percent, all in the three smallest sizes, said competition was a source of risk.

Objective 3

To determine why risk management tools have been under-utilized in California, the answers to three questions proved to be useful: (1) What risk management tools do California producers use? (2) Which of these tools are preferred? (3) How do producers rate available risk management tools relative to one another? (Tables 4 and 5).

Question 1 produced the responses presented in Table 4. Producers use diversification more than any other risk management tool available in California. This is not surprising in a state where 250 commodities are produced. It supports the hypothesis that producers have enterprise portfolios which they adjust in response to perceived changes in risk (Blank 1990; Weimar and Hallam), as suggested by the portfolio theory outlined earlier. Crop insurance, forward contracting, and government programs are used by about one half as many producers. Surprisingly, crop insurance ranks second overall in percent of producers who have used it. This

<table>
<thead>
<tr>
<th>Tool</th>
<th>(Percent using)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop insurance</td>
<td>24.4</td>
</tr>
<tr>
<td>Diversification</td>
<td>47.6</td>
</tr>
<tr>
<td>Forward Contract</td>
<td>23.4</td>
</tr>
<tr>
<td>Gvt. Program</td>
<td>20.0</td>
</tr>
<tr>
<td>Hedging</td>
<td>6.2</td>
</tr>
<tr>
<td>Labor Contract</td>
<td>1.2</td>
</tr>
<tr>
<td>Capital</td>
<td>1.1</td>
</tr>
<tr>
<td>Diverse*</td>
<td>1.6</td>
</tr>
<tr>
<td>None</td>
<td>1.9</td>
</tr>
<tr>
<td>Other</td>
<td>6.3</td>
</tr>
</tbody>
</table>

*This includes diversifying income sources and diversifying into multiple geographical markets for a product.
implies that for some people insurance works well, but for other people insurance does not meet a need. Production of different commodities explains the difference in demand for insurance. Producers use forward contracting more consistently, but many California crop markets require contracting, thus not all use depends on risk management issues. Government programs are used by varying percentages of growers in different crop markets. This implies that differences in commodities being produced help to explain the use of risk tools. A small minority of producers hedge with futures or options. The main reason producers do not use this risk management tool because it is not available for many California commodities. Respondents wrote in the other tools listed in Table 4.

The responses to question 2, summarized in the first column of Table 5, provide additional insight regarding the level of usage for the risk management tools. The first column shows the percentage of producers ranking the tool as their first (preferred) choice. Note that between 35 and 57 percent of respondents did not rank each tool (as indicated in the last column), thus significant uncertainty exists as to the interpretation of these results. It is unclear whether non-respondents prefer other tools, such as those listed in Table 4, or simply did not understand the question. We expect that most non-respondents did not rank tools with which they have no experience.

| Table 5. Producers' Preferences for Risk Management Tools |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Rank            | 1st (Percent)   | 2nd (Percent)   | 3rd (Percent)   | 4th (Percent)   | 5th (Percent)   | Unranked (Percent) |
| Crop Insurance  | 16.5            | 15.1            | 8.4             | 8.8             | 7.4             | 43.8            |
| Diversify       | 43.8            | 13.0            | 4.2             | 2.6             | 1.1             | 35.3            |
| Forward Contract| 11.4            | 21.6            | 10.9            | 5.1             | 2.8             | 48.2            |
| Gvt Program     | 6.2             | 11.2            | 10.5            | 7.0             | 13.7            | 51.3            |
| Hedging         | 1.8             | 6.2             | 9.5             | 12.1            | 12.8            | 57.6            |

The preferences indicated in Table 5 are similar to the results for levels of use for the risk tools. Producers clearly prefer diversification for dealing with risk overall. Although diversification is viewed as "less of a sure thing"
regarding its ability to reduce risk, many producers continue to diversify, indicating that they believe some risk reduction is worthwhile although not precisely forecastable. About one ninth of producers prefer forward contracting because it guarantees a reduction in price risk. The fact that few respondents prefer hedging and participation in government programs is explained largely by the tools' limited availability and the popularity of diversification.

The remainder of Table 5 presents the rankings given by producers in response to question 2. In general, diversification, forward contracting, and crop insurance rank highest for managing risk (in that order according to a weighted average of all rankings given). Clearly, producers do not believe government programs and hedging are as useful in managing risk as are the other three tools. For government programs, this general attitude is supported by results of previous studies (Carriker et. al., Williams et. al., 1990, 1993).

In general, individual producers may under-utilize risk management tools because the tools do not adequately provide protection from risks found in California's agricultural markets. This suggests that producers need new tools for managing risk, or we need to redesign the tools to better suit the needs of producers in the state.

As in the case of producers, risk management tools appear to be under-utilized by a majority of cooperatives interviewed, although coops use risk tools more than individuals do. As shown in Figure 1, over 46 percent of the cooperatives surveyed listed day-to-day management, such as “knowing customers character” or “serve customers,” as a strategy for dealing with risk. Almost as many, 42 percent, listed such strategies as one of their two most important means of dealing with risk. This reflects a poor understanding of the question or a lack of explicit mechanisms to deal with problems related to risk as distinct from other business problems.

Most coops manage risk by using some type of insurance (cited by over 88 percent of the respondents). However, less than 27 percent of coops listed insurance as one of the two most important strategies, implying that
coverage for many of the risks faced by agribusiness is limited. Over one-third of the cooperatives interviewed prefer diversification, but the ability of the smallest cooperatives to diversify may be a major constraint. The smallest cooperatives use risk-reducing inputs, but they indicated that their most important strategies include insurance and day-to-day management. The smallest cooperatives also appeared unable to take advantage of government programs or of market mechanisms like forward contracting or hedging which were used by the larger-sized coops.

Also of interest is differences between cooperatives and proprietary firms in their perceptions and responses to risk. Cooperative officials were asked two questions on this subject to elicit their opinions: "Are the risks and strategies identified above different from those faced or pursued by a proprietary firm engaged in a similar activity?" The large majority (84.6 percent) of coops said that there was no difference between the two types of businesses. A few qualified their responses by noting that no proprietary firm was engaged in the type of activity which they pursued. Of those who gave an affirmative response, all were in the medium to medium-large range in size. Dairy cooperatives also tended to answer affirmatively.
Respondents were also asked if they agreed with the statement: “A coop can manage risk better than a proprietary firm because the coop has more complete and ready access to relevant information about its members.” Again, most (73.1 percent) said no, cooperatives do not have a significant advantage over other firms. About three-fourths of those disagreed on the grounds that cooperatives do not have better access to membership information while the rest believed that cooperatives had no advantage in risk management. One respondent noted that the cooperative was organized for the benefit of the membership, thus increasing its own risk in order to reduce the risk to the producer. The cooperative’s goal is to increase its input costs—that is, the return paid to the member—rather than lowering costs. Those agreeing with the statement noted that the cooperative structure provides information about markets that may not be available to proprietary firms and ensures a constant supply of inputs. Again, affirmative responses came mainly from dairy cooperatives, but the size of the cooperative appeared much less important in determining the respondents answers.

Objective 4

To identify any differences in risk attitudes and/or operating procedures between land owners and tenants, we compared the responses to the questions presented in Tables 1 and 2. Although the sample included 53 percent owners and 47 percent tenants (on at least some of the land used), there is little difference between their responses. Some notable exceptions occur in the responses to questions in Table 2. Tenants are more likely to have contingency plans for dealing with risks, and they are twice as likely to have changed crops to reduce their credit needs. These differences indicate that tenants may be more sensitive to risk.

The greatest difference hypothesized to exist between owner and tenant farmers is in the degree of risk efficiency expected in the crop portfolios produced by growers that are highly risk averse. To test this hypothesis, responses to the question, “are you satisfied with the risk/return tradeoff available on the crops you produce
currently?" (Table 2) were cross-tabulated for highly risk-averse and less risk-averse growers. We define less risk-averse growers as those whose selected portfolio is more risky than the optimal portfolio in the county: \( \gamma^* \geq \gamma^* \). Risk-averse growers are defined as those selecting a portfolio which is less risky than the optimal portfolio for the county: \( \gamma^* < \gamma^* \). Less risk-averse growers with the same risk attitudes and expectations would produce the same portfolio. Although we cannot precisely measure a person’s risk preference, we can argue that someone whose primary crop is considered to be risky, such as lettuce, tomatoes, strawberries, or peaches, is a less risk-averse grower. Conversely, we can classify someone whose primary crop is considered to be low risk, such as wheat, corn, alfalfa, or sugar beets, as a risk-averse grower. Therefore, land owners and tenants who produce similar portfolios of risky crops are doing so by choice and are expected to have similar degrees of satisfaction with that choice, as evidenced by a positive response to question 7 in Table 2. We also expect that risk-averse land owners would be more satisfied with their crop portfolio’s risk/return tradeoff than would tenants producing the same primary crop because risk-averse tenants are sometimes forced to produce a less efficient crop portfolio, as explained earlier. Results presented in Table 2 support both of these hypotheses. Tenants growing low risk crops are significantly less satisfied with the efficiency of their crop’s risk/return tradeoff than are other producers.

V. Demand for Credit

To fulfill objectives 5 and 6, the following sections identify the sources of demand for credit and describe the expected trends in credit demand from major commodity sectors in California agriculture. The information reported here comes from interviews with agribusiness managers and individual producers. The data was collected during the summer of 1993, reflecting the general attitudes of agricultural borrowers at that point in time.
Objective 5: Sources of Demand for Credit

Demand for agricultural credit occurs at two distinct levels, both of which are related. First, there is a demand for funds at the production level, second, there is demand for funds at the post-harvest level which includes the functions of storage, processing and packing, distribution, transportation, and marketing. Demand for funds for activities at both levels include short-term operating capital and long-term capital for land, building, and equipment acquisition, and improvements. In addition, producers and managers will demand funds to implement the adoption of new technologies and management strategies. These demands for capital and operating funds are commonly thought of as necessary for producing and marketing products (US Board of Governors of the Federal Reserve System, US GAO).

In the aggregate, farmers will demand credit for operational activities on a year-to-year basis and on an occasional basis for capital improvements. Demand for funds will grow over time due to inflationary price increases which are offset, to some degree, by increases in productivity through the adoption of new technologies and management strategies. Demand for funds in production agriculture will shift according to a number of factors, including shifts in cropping patterns, adoption of new technologies, and increased government regulations relating to health, safety, the environment, and resource use. The first two factors are more traditional in terms of increasing demand for credit, the latter increasingly place pressures on agriculture for more credit. The same factors also affect credit demand from the agribusiness sector responsible for processing, storage, marketing, and distribution.

In the following sections, recent trends in agricultural production in California are outlined along with their implications concerning the future demand for credit by producers and agribusiness firms. These trends support the conclusion reached earlier that an increase in the perceived level of risk in agriculture will cause changes in the composition of the state's output. It is also argued that these output changes will alter the level and nature of credit demand.
Objective 6: Trends in Agricultural Production and Demand for Credit

California is known for its ability to competitively produce high-value, high-quality agricultural products. It leads the U.S. with a gross farm income valued at about $18 billion in 1992. The value of agricultural products after harvest is estimated to be 2.5 times farm value. California agriculture's leadership results from a combination of a high rate of technological innovation, a high level of management skills, a high rate of resource use, and a beneficial climate. The first three factors all involve a high level of credit demand.

California produces over 50 percent of the U.S.'s fruits, nuts, and vegetables on only 3 percent of its farmland. Over 250 products are produced in California on 30.3 million acres with most produced on less than 8 million irrigated acres and a total of about 83,000 farms. Agriculture uses about 85 percent of the water supplies in California. In addition to utilizing high levels of capital, California agriculture also depends on significant amounts of labor with employment averaging nearly 300,000 workers.

Table 6 contains a summary of the major crop and livestock commodities in order of major groupings and 1991 gross farm values. Although California is known for its production of speciality crops (fruits, nuts, and vegetables), the consistent leaders in the state in terms of gross farm value are milk and cream and cattle and calves. These two commodities amount to $2.5 billion and $1.7 billion respectively; both account for over one-fifth of the gross farm income. Overall, the livestock and poultry sector has a gross farm value of $5.3 billion. The fruit and nut crops follow with $4.9 billion, vegetables with $3.5 billion, field crops with $2.7 billion, and nursery crops with $1.9 billion.

California leads the nation in the production of many fruit and nut crops and is the exclusive supplier of almonds, clingstone peaches, dates, figs, kiwifruit, olives, pistachios, pomegranates, prunes, raisins, and walnuts. Significant changes have taken place in the fruit and nut industries over the past decade. Statewide, acreage has increased substantially. Acreages have shifted from
<table>
<thead>
<tr>
<th>Commodity</th>
<th>1991 Value ($1,000)</th>
<th>Harvested Acreage (1,000 ac)</th>
<th>Share of U.S. Production (Percent)</th>
<th>Percent Exported (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Livestock and Poultry</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk and Cream</td>
<td>2,454,538</td>
<td></td>
<td>14.6</td>
<td>4.4</td>
</tr>
<tr>
<td>Cattle and Calves</td>
<td>1,681,643</td>
<td></td>
<td>4.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Eggs, Chicken</td>
<td>362,276</td>
<td></td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>Chickens</td>
<td>386,411</td>
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<td></td>
</tr>
<tr>
<td>Turkeys</td>
<td>241,425</td>
<td></td>
<td>10.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Hogs and Pigs</td>
<td>45,224</td>
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<td>0.3</td>
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</tr>
<tr>
<td>Sheep and Lambs</td>
<td>40,984</td>
<td></td>
<td>9.6</td>
<td>6.2</td>
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<tr>
<td>Other</td>
<td>109,642</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Fruits and Nut Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grapes, All</td>
<td>1,558,663</td>
<td>636.5</td>
<td>86.6</td>
<td>20.5</td>
</tr>
<tr>
<td>Almonds, shelled</td>
<td>540,474</td>
<td>380</td>
<td>99.9</td>
<td>72.4</td>
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<tr>
<td>Strawberries</td>
<td>465,515</td>
<td>21.1</td>
<td>80.2</td>
<td>10.4</td>
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<tr>
<td>Oranges, All</td>
<td>380,576</td>
<td>178.1</td>
<td>14.9</td>
<td>37.3</td>
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<tr>
<td>Walnuts</td>
<td>279,720</td>
<td>181</td>
<td>99</td>
<td>46.5</td>
</tr>
<tr>
<td>Lemons</td>
<td>248,434</td>
<td>46.7</td>
<td>78.4</td>
<td>30.7</td>
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<td>Avocados</td>
<td>191,760</td>
<td>74.2</td>
<td>87.2</td>
<td>3.9</td>
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<tr>
<td>Peaches, All</td>
<td>186,975</td>
<td>54.1</td>
<td>61.3</td>
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<tr>
<td>Apples</td>
<td>180,900</td>
<td>31.5</td>
<td>8.1</td>
<td></td>
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<tr>
<td>Prunes, Dried</td>
<td>178,398</td>
<td>60</td>
<td>100</td>
<td>53.6</td>
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<tr>
<td>Plums</td>
<td>97,894</td>
<td>42.1</td>
<td>88.7</td>
<td>28.4</td>
</tr>
<tr>
<td>Pitted Cherries</td>
<td>96,250</td>
<td>52.1</td>
<td>100</td>
<td>33.4</td>
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<tr>
<td>Nectarines</td>
<td>86,457</td>
<td>25.9</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>Pears, All</td>
<td>83,403</td>
<td>23.4</td>
<td>35</td>
<td>4</td>
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<tr>
<td>Grapefruit</td>
<td>47,192</td>
<td>18.3</td>
<td>14.4</td>
<td>26</td>
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<tr>
<td>Olives</td>
<td>36,499</td>
<td>28.7</td>
<td>99.9</td>
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<td>Cherries, Sweet</td>
<td>33,864</td>
<td>10.8</td>
<td>23.8</td>
<td>28.9</td>
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<tr>
<td>Apricots</td>
<td>32,183</td>
<td>17.3</td>
<td>93.9</td>
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<td>Other</td>
<td>180,782</td>
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<tr>
<td><strong>Vegetables</strong></td>
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<td></td>
</tr>
<tr>
<td>Tomatoes, Processing</td>
<td>3,477,389</td>
<td>1,124.0</td>
<td>91</td>
<td>4.7</td>
</tr>
<tr>
<td>Lettuce</td>
<td>640,111</td>
<td>312</td>
<td>71.9</td>
<td>8.2</td>
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<tr>
<td>Tomatoes, Fresh</td>
<td>600,056</td>
<td>152</td>
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<td>8.2</td>
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<tr>
<td>Broccoli</td>
<td>228,000</td>
<td>40</td>
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<tr>
<td>Carrots</td>
<td>215,550</td>
<td>86</td>
<td>90.4</td>
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<td>Potatoes</td>
<td>200,070</td>
<td>56</td>
<td>56.3</td>
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<td>Cauliflower</td>
<td>183,156</td>
<td>45.7</td>
<td>4</td>
<td>8.2</td>
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<tr>
<td>Celery</td>
<td>149,054</td>
<td>42</td>
<td>77.5</td>
<td>24.3</td>
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<td>Onions</td>
<td>130,390</td>
<td>36.6</td>
<td>73.4</td>
<td>13.7</td>
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<td>Mushrooms</td>
<td>172,750</td>
<td>0.6</td>
<td>27.1</td>
<td>34.4</td>
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<tr>
<td>Asparagus</td>
<td>73,258</td>
<td>33.5</td>
<td>41.6</td>
<td>29.7</td>
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<tr>
<td>Sweet Potatoes</td>
<td>41,111</td>
<td>8.2</td>
<td>12.7</td>
<td></td>
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<tr>
<td>Honeydew Melons</td>
<td>38,749</td>
<td>18.2</td>
<td>68.2</td>
<td>29.8</td>
</tr>
<tr>
<td>Cantaloupes</td>
<td>924,810</td>
<td></td>
<td>324.2</td>
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<tr>
<td><strong>Field Crops</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>2,681,334</td>
<td>4,523.0</td>
<td>15</td>
<td>73.5</td>
</tr>
<tr>
<td>Total Hay</td>
<td>987,230</td>
<td>1,041.0</td>
<td>5.6</td>
<td>14.2</td>
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<td>Rice</td>
<td>395,195</td>
<td>325</td>
<td>16.4</td>
<td>13</td>
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<tr>
<td>Sugar Beets</td>
<td>262,343</td>
<td>159</td>
<td>13.4</td>
<td></td>
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<tr>
<td>Wheat</td>
<td>116,888</td>
<td>442</td>
<td>1.8</td>
<td>52.7</td>
</tr>
<tr>
<td>Beans, Dry</td>
<td>87,556</td>
<td>144</td>
<td>9.5</td>
<td>31.3</td>
</tr>
<tr>
<td>Corn for Grain</td>
<td>57,960</td>
<td>115</td>
<td>0.2</td>
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<tr>
<td>Alfalfa Seed</td>
<td>50,445</td>
<td>68</td>
<td>37.7</td>
<td>13</td>
</tr>
<tr>
<td>Barley</td>
<td>23,600</td>
<td>160</td>
<td>2</td>
<td>8.4</td>
</tr>
<tr>
<td>Safflower</td>
<td>113,612</td>
<td></td>
<td>335.1</td>
<td></td>
</tr>
<tr>
<td><strong>Nursery &amp; Flowers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursery Products</td>
<td>1,935,522</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flowers &amp; Foliage</td>
<td>1,255,967</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18,268,576</td>
<td>7,596.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Government Payments</strong></td>
<td>260,800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total, All receipts</strong></td>
<td>18,529,376</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
coastal areas to the San Joaquin Valley, as well as from acreages formerly planted to field crops. Yields have increased with the development of new varieties. In addition, these newer varieties have lengthened the season for many crops and improved quality. Many of California’s fruit and nut crops are exported and significant growth has taken place over the past six years.

California is also the leading producer of vegetables in the U.S. with 52 percent of the 10 major fresh market vegetables and 62 percent of the five major processing vegetables. Processing tomatoes are the largest commodity in terms of value, comprising over 18 percent of total vegetable production. Lettuce accounts for another 17 percent, and broccoli, fresh tomatoes, carrots, cauliflower, celery, potatoes, and mushrooms combine for an additional 35 percent. California vegetable production has expanded in acreage by 19.3 percent and in production by 39 percent over the past ten years.

California is not known for its production of field crops, but significant quantities of cotton, rice, sugar beets, dry beans, and alfalfa are grown. While the value of field crops accounts for only 15 percent of the total farm value of commodities in California, harvested acres account for almost 60 percent of total acreage. In addition, significant amounts of field crops are exported, notably cotton, rice, wheat, alfalfa seed, and safflower.

Nursery and floral products account for a growing share of the gross farm product for California. The 1991 value of these products exceeded $1.9 billion, more than double the 1982 value.

In looking ahead, a number of issues loom as significant sources of risk which will affect the welfare of California agriculture. Chief among these issues is the continuing pressure on agriculture to use less of the state’s water supply. The recently passed legislation affects the distribution of water supplies under the Central Valley Project. Increasing environmental regulations regarding water quality and wildlife protection will also pose major challenges. Many pesticides are currently under review for re-registration. A number of pesticides critical to California agriculture are being challenged for
environmental and health reasons. Also of concern is the invasion of exotic pests, most notably the various fruit flies imported from outside California, and the Sweet Potato Whitefly which has devastated crops in the Imperial Valley and threatens the rest of the state. Finally, with a new administration in Washington, D.C., there is a great deal of uncertainty over continuation of the various domestic and export programs that have lent stability to various parts of California agriculture. Resolution of the many issues confronting California agriculture will require increased attention, and no doubt, increased financial resources to develop necessary strategies.

i. Impact of Shifts in Production on Credit Needs

As producers shift from low-value field crops to higher-value fruit, nut, vegetable, and nursery crops, demands for credit will shift significantly. Higher-value crops demand increased amounts of technology, labor, and management to be able to produce high quality products that appeal to discriminating consumers on the world market. Hence, increased funds will be needed for the conversion of crop land to high value crops.

For example, the shift from wheat to a vine or tree crop involves a number of operations requiring significant capital. In a vine crop the start up costs could easily exceed $10,000 per acre. These costs cover ground preparation (ripping the ground to provide drainage and application of chemicals to eliminate undesirable pests and diseases), plant materials and planting, installation of a drip irrigation system, frost control equipment, and specialized cultural equipment. Producers would need to borrow enough capital to finance the operation for three years until the vineyard starts to produce. A tree crop could take up to eight years before generating positive cash flows!

The shift in acreages in California during the past 10 years has been dramatic (Figure 2). Overall, harvested acreage has declined from 9,250,000 acres in 1982 to 7,596,000 acres in 1992. Fruit and nut crop acreage has increased from 1,812,000 acres to 1,949,000 acres, and vegetable crops have increased from 936,000 acres to 1,124,000 acres. This demonstrates two on-going trends.
The first is that, overall, agriculture continues to lose acreage to increasing urbanization. As importantly, a simultaneous shift from field crops to fruit, nut, and vegetable crops is taking place. This shift, coupled with

**Figure 2.** Change in Harvested Acreage (1982-92)

![Graph showing change in harvested acreage](image)

an increase in the nursery crop sector, has allowed California agriculture to continue to grow in gross farm value from $14.3 billion in 1982 to $18.5 billion in 1991.

As producers shift crop land to higher-value uses, a commensurate investment is being made in the processing, packing, storage, transportation, distribution, and marketing activities. Hence, increased capital is needed for these activities as well.

We expect these shifts to continue into the foreseeable future. The reason for this lies primarily with the pressure being placed on agriculture from fewer and more costly resources, especially water, which will necessitate a shift to higher-value crops in order to cover the higher expenses associated with cultivating farm products. These shifts mean that the demand for credit will be particularly strong in the higher-value, riskier crops like fruit, nuts, and vegetables but weaker among field crop growers. Continued growth in the livestock sector implies a steady demand for financing as well. In addition to these background shifts, other factors will influence the demand for credit in California agriculture.
ii. Impact of Product Quality on Credit

In order to produce high quality crops, California agriculture has relied on the application of technology and management skills. As technologies diffuse to other areas, it becomes necessary to develop new strategies in order to remain competitive. The research and development of applicable techniques require the use of significant amounts of capital, and industry itself will be called upon to make increasing contributions as state budgets are reduced. Quality concerns are especially important in specialty crops like fresh fruits, nuts, vegetables, and livestock products which must meet consumer and marketing standards. They are much less important in field crops. For example, California cotton quality is well established, in part, because of a favorable climate, giving it a distinct advantage over Texas production. Quality concerns may become important in specific field crops like rice, for example, which must meet exacting taste standards of Japanese consumers. However, the impact of quality on the demand for credit will be higher in the fruit, nut, and vegetable sectors than in field crops.

iii. Impact of Technology on Credit

As mentioned earlier, California is known for high technology agriculture. As shifts are made to produce more fruit, nut, nursery, and vegetable crops, increasing applications of technology will necessitate increased investment. For California agriculture to maintain its competitive edge in world markets, farmers need increased technology.

Much of California agriculture’s technology has been produced through public sector investment in University of California and U.S. Department of Agriculture research programs. However, the amount of public funds being allocated to agricultural research is diminishing, necessitating the increased investment in research by the private sector. Also, because many of California’s crops are considered to be minor (i.e. they don’t produce a large enough revenue stream to justify large scale investments in technology research), it is likely that agricultural producers may have to provide more funds for research through marketing orders or some other mecha-
nism. In summary, the need for high technology by California agriculture will have a significant impact on credit demand.

Investments in the development of new technologies will be a high risk venture. Consumers remain wary of many biological innovations including hormones intended to increase production in the livestock sector and genetic engineering for improved shelf-life of vegetables. Given the potential backlash, industry and marketing organizations will likely move very slowly, mitigating the demand for funds, especially in the fresh fruit, vegetable, and livestock sectors. The most readily applicable technologies will probably be more management-intensive and be closely bound with quality control issues. Again, this will affect credit demand more strongly in the livestock, fruit and nut, and vegetable sectors than the field crop sector.

iv. Impact of Regulation on Credit

A changing regulatory picture will impact the need for credit by California agriculture. In particular, increased regulations on water use, drainage, water quality, pesticides, and environmental considerations will force producers to adopt new technologies, shift cropping patterns, and develop new management strategies.

The decrease in allotments of surface water coupled with significant price increases will force California agriculture to shift to higher-value crops and adopt water saving technologies. Both of these considerations require increased capital. In the case of water-saving technologies, the installation of drip irrigation equipment and return flow systems require substantial amounts of capital.

Another consideration for farmers as surface water quantities decrease is the shift to groundwater sources, requiring the drilling of wells and the installation of pumps. In some cases, diesel power units will also have to be installed, requiring even more capital.

Drainage of agricultural lands poses yet another problem, particularly on the west side of the San Joaquin Valley. Due to the high salt and mineral content of the water drained from agricultural lands, increased restric-
tions have been placed on drainage. These restrictions have necessitated increased investment in irrigation technologies to decrease the amount of water that must be drained.

Water quality involves two considerations: (1) the necessary investment in technologies and management strategies to prevent degradation of water supplies and (2) the cleanup of contaminated water supplies. While agricultural production practices have caused a degree of well water contamination, agricultural processing operations have an even greater problem in cleaning up certain areas. Cleanup operations cost far more than adopting technologies to prevent contamination in the first place. There have been instances of bankruptcies due to the costs of cleaning up water quality problems.

California agriculture is rapidly losing its chemical arsenal due to increased regulation. Much of this is due to the process of re-registering pesticides and other chemicals to meet stricter environmental and health standards. Many chemical companies have opted not to renew registrations due to the expectation that not enough revenue will be produced from the sale of a chemical for a specific crop that would justify the investment in the re-registration process. Hence, California agriculture is faced with at least two courses of action. One is to shift to other alternatives that may be less effective and more costly. Another choice is to finance the necessary documentation for re-registration itself or in combination with the chemical companies. Yet a third choice is invest more money into research to develop new alternatives that meet regulatory considerations. All involve an increased demand for funds.

Other environmental and health regulations will require additional sources of funds, not only to comply with them, but also to meet the increasing amount of documentation and legal and accounting considerations and actions. The livestock sector will probably be one of the most strongly affected sectors by the changing regulatory environment—from waste management at the farm level to the maintenance of health standards at the processing level. A strong increase in the demand for credit to meet these requirements is expected.
Reductions in water availability will hasten the shift from field crops to higher-valued crops and from extensive production toward production concentrated on less land. This will decrease credit requirements even further for field crops in the aggregate and increase demand for installation of new orchards or for new equipment for vegetable production. Restrictions on applications of chemical treatments will force producers of fruits, nuts, and vegetables to substitute more labor and management inputs which will increase operating expenses and increase demand for more short-term credit.

Thus, the impact of quality, technological, and regulatory concerns in California agriculture will likely enhance the impact of long-term shifts in production on the demand for credit. Credit demand will decrease, in the aggregate, in the field crop sector but show strong growth from livestock producers and growers of specialty crops like fruits, nuts and vegetables. The higher production risk of these specialty crops relative to field crops will have important implications on whether lenders will be willing to meet this increased demand for financing.

v. Firm-Level Sources of Demand for Credit

To gain insight as to the current nature of credit demand from individual firms, we conducted a series of interviews with various cooperatives in California. The cooperatives were selected to offer a range of commodities, functions, and sizes. The functions performed by the cooperatives ranged from solely input supply, through processing, to solely marketing. Others performed multiple functions—supply and marketing or processing and marketing. As would be expected, the livestock cooperatives all engaged in some kind of processing while none of the coops involved with field crops did any processing. The size of the cooperatives varied widely. One had only three members while the largest had approximately 6500.

Of the 26 cooperatives interviewed, all but two were currently carrying or had recently carried debt. All borrowers had some kind of short-term borrowing or line of credit which is predominantly used as operating funds. In addition, half of the borrowing cooperatives carried longer-term debt which was used for expanding capital
such as machinery or buildings. The type of borrowing undertaken by the cooperatives was compared across commodities, function and size. The results indicate that cooperatives specializing in field crops tend to rely on short-term borrowing as their functions are largely input supply and marketing. Coops which perform processing functions, such as dairy cooperatives, were more likely to carry long-term debt. The number of coop members also appears important to the borrowing decision. None of the smallest cooperatives carried long-term debt, while all but one of the five largest had long-term debt. Middle-sized coops were evenly split between those with only short-term debt and those also borrowing over the long term.

Respondents were questioned as to what factors influence whether and how much the cooperative borrows. The vast majority (80 percent) said that borrowing was driven by need—that is the cooperative’s operating requirements. This seems largely to result from the timing of expenditures and revenues. Other influences varied over the size of the coop. Only 36 percent of the coops mentioned interest rates, and several noted that they were not interest-rate sensitive. None of the largest cooperatives mentioned interest rates, other borrowing costs or any type of lender restrictions, though one stated that the entire deal was important. The smallest cooperatives were similarly, or symmetrically, unaffected by such factors while some of the medium-sized coops mentioned them as influencing their borrowing decisions. These results are similar to those of other studies of demand for agricultural credit (such as Turvey and Weersink).

The cooperative representatives were also questioned as to their members’ demand for credit. Of the 25 responses, all said their members borrow with 60 percent stating that producers hold both short and long-term debt. Most farmers belonging to field-crop cooperatives held only short-term debt—not surprising given the yearly planting and harvest cycle. Those belonging to fruit and nut cooperatives were more likely to have both types of debt, and all the livestock coops stated that members borrowed for both the long and short term.

As asked about the factors which determine the extent of members’ borrowing, most stated that commod-
ity prices and/or production costs were important influences, and this was true across commodities. Unlike the cooperatives themselves, members appear to be influenced by the interest rate, and 52 percent of the cooperative representatives thought lender restrictions were important considerations, especially on the amount borrowed. Again, this appears consistent across commodities though it is a bit more pronounced among the dairy producers.

VI. Borrowers’ Current Views of Agricultural Credit

To assess how the credit environment is perceived by agribusiness, as represented by cooperatives, and by producers, as they have related their concerns to the cooperative managers, a series of questions were asked on two topics: (1) requirements for borrowing and (2) financial services offered by coops. The results help this chapter reach objective 7 by providing insight into two commonly stated hypotheses concerning credit. First, it is believed that lenders have tightened their requirements for credit—a direct result of the new risk environment in agriculture. Second, non-traditional lenders offer more financial services. Financial services offered by agribusiness firms, such as coops, are thought to be less available from lenders or are of a type that traditional lenders no longer have any comparative advantage in offering.

Requirements for Borrowing

The results concerning requirements for gaining credit appear to indicate a large difference between the effects of recent changes on agribusiness firms and individual producers. As shown in Figure 3, over 70 percent of the coops surveyed felt that lender requirements were no more difficult to meet than in previous years, and 88 percent said that financing had not curtailed coop activities. The other respondents tended to put a positive “spin” on their reply, stating that any restrictions on activity were due largely to internal
discipline or helped to improve discipline. In contrast, over 95 percent of coops said members had complained of stricter lending requirements, and over 46 percent said their activities had been curtailed due to a lack of financing or timing problems.

Some interesting differences according to commodity and cooperative size lie beneath these numbers. Three out of the four dairy coops felt that borrowing requirements are presently more difficult to meet versus similar responses from only one-third of the field crop coops, less than one-fifth of the fruit and nut coops, and none of the supply coops. None of the dairy coops felt that member activity had been curtailed by financing difficulties while other coops thought there was a fairly even split as to the impact of borrowing restrictions. At the producer level, this is probably due to the higher collateral value of livestock relative to field or perennial crops. At the cooperative level, this effect seems to result largely because of the size of the coop.

Smaller cooperatives (less than 100 members) perceived a greater strictness on the part of lenders, and it was the cooperatives in the middle range (between 100 and 1000 members) who said their functioning had been curtailed by lack or timing of financing. All the dairy cooperatives belong to this middle range. The information required in loan packages tends to support this perception. The most common requirement mentioned (by 65 percent of coops), and noted consistently across size groupings, was financial statements of some kind. These include retains, inventory, and collateral, which are all liquidated assets. Indices of shorter-term cash flow (i.e., accounts receivable, operating cash and sales) were mentioned by 52 percent of total respondents. However, only 20 percent of the largest cooperatives mentioned such a requirement while 60-67 percent of the small and medium sized firms did note it. Specific ratios (e.g., debt-to-equity) were mentioned by 50 percent and 80 percent of the coops in the two medium-sized groups (100-400 and 400-1000 members, respectively), but none of the smallest coops and only 20 percent of the largest coops listed ratios. It is interesting to note that all of the dairy cooperatives mentioned specific ratios among the information requested by lenders.
Figure 3. Requirements for Borrowing

**Cooperatives**

- No More Difficult: 70%
- Did Curtail: 12%
- Did Not Curtail: 88%

**Members**

- No More Difficult: 5%
- More Difficult: 95%
- Did Curtail: 46%
- Did Not Curtail: 54%
These results contend that borrowing restrictions have shifted away from traditional measures of equity and toward sources of repayment, and the change has affected medium-sized cooperatives and agribusiness firms. It is not completely clear why there should be this difference, but the greater stability of larger coops may be a factor. Another factor may be the source of financing available to cooperatives of different sizes. Results of the interviews indicate that the largest cooperatives draw on a greater variety of funding sources with an average of 2.6 sources from those listed in Table 7. The smallest coops have an average of 1.5 sources of credit while the medium-sized organizations draw on 1.7 and 1.8 sources on average.

The primary lender to cooperatives appears to be CoBank in Denver which supplies credit in some form to 72 percent of the coops interviewed. Broken down by size, the results show that only 25 percent of the smallest coops, 70 and 83 percent of medium-sized coops, and all of the largest cooperatives in the sample receive some financing from CoBank. The smallest cooperatives (less than 100 members) are more likely to receive credit from local community banks, while 40 percent of coops between 100 and 400 members received financing from local banks and an equal amount from large commercial banks such as Wells Fargo or Bank of America. Medium-large coops (400 - 1000 members) were more likely to receive credit from larger banks; two-thirds mentioned this source. As firms grow in size, it appears they are more willing or able to do business with large commercial banks (see

<table>
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<th>Source:</th>
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<td>N&lt;100</td>
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<tr>
<td>(Percent using source)</td>
<td></td>
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<tr>
<td>Large bank</td>
<td>25</td>
</tr>
<tr>
<td>Small bank</td>
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<td>CoBank</td>
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<td>Government</td>
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<td>Other</td>
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Table 7. Sources of Credit by Size of Cooperative
Figure 4. Sources of Credit for Cooperatives: Banks

Figure 4. Yet, even as they grow very large and more financially independent, agribusiness firms maintain contacts with small banks.

Membership borrowing is somewhat similar with the vast majority of respondents (96 percent) mentioning the Farm Credit System as a source of financing. Similar numbers mentioned local community banks and large commercial banks. No major differences were noted across producers of various commodities, though growers of field crops seem more likely to use local banks than statewide commercial lenders. Only 16 out of 26 cooperative officers felt informed enough to comment on loan requirements for their membership, but results tend to agree with a similar shift from real estate collateral to cash flow requirements. Of the respondents, 75 percent mentioned cash flow or some other short-term measure of ability to repay, and this was consistent across commodities. Fifty percent also mentioned financial statements as indices of liquid assets. Relatively fewer of those specializing in field crops mentioned this information. This may be due to the nature of borrowing for crops which will be harvested and sold within the year as opposed to loans for perennial crops and livestock production.
Financial Services Offered by Firms

Members form cooperatives to obtain greater market power than they would otherwise possess. Cooperatives may also provide services to members that producers would otherwise have difficulty obtaining or could obtain only at higher cost. Cooperatives were asked what types of financial services they offered their members. Four cooperatives, or just over 15 percent of the sample, said they provided no financial services. Half of the cooperatives provide some type of advance on the sale of a grower’s commodity. Depending on the timing of the advance, interest may be charged. Members obtain insurance through 42 percent of the cooperatives, and a similar number offer credit on the purchase of inputs. Five coops take assignments for lenders, and interestingly, this group includes all four of the dairy cooperatives which were interviewed.

The function of the cooperative determines to some extent the services provided to the membership. Cooperatives engaged in input supply were more likely to offer credit for purchases, while marketing cooperatives were more likely to provide advances on sales. However, size of the cooperative seems to determine to a great extent the type and number of services offered. The smallest cooperatives offered only one service from those listed in Table 8, on average, to their members, and that service was either insurance or input credit. The reasons given for providing these services was that it is a normal business practice (e.g. for suppliers), or it was for the benefit of the members. When asked why financial services were not offered, 75 percent of the smallest cooperatives answered that the risk to the coop was too large; only two cooperatives with more than 100 members mentioned risk as a reason for not offering financial services.

It appears that the cooperatives in the middle-sized ranges (100-400 and 400-1000 members) have the greatest demands placed on them for financial services. On average, coops of this size offer 1.7 and 2.7 services, respectively. The number of services provided by the largest cooperatives declines again to an average of 1.8. Input credit, insurance, and advances are the most
Table 8. Financial Services Offered by Size of Cooperative

<table>
<thead>
<tr>
<th>Service</th>
<th>Number of Cooperative Members</th>
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<tbody>
<tr>
<td></td>
<td>N&lt;100</td>
</tr>
<tr>
<td>(Percent)</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>50</td>
</tr>
<tr>
<td>Input credit</td>
<td>50</td>
</tr>
<tr>
<td>Advances</td>
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</tr>
<tr>
<td>Assignment</td>
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</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
<tr>
<td>None</td>
<td>25</td>
</tr>
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</table>

common forms of services offered by coops in the middle two ranges, with advances being dominant in the medium-large cooperatives. These cooperatives were the only ones interviewed that took assignments for lenders. Member benefit is the primary reason given for offering financial services, but pressure from competition is a close second. At the same time, lack of demand is the major reason other financial services are not offered. It may be that these sizes of cooperatives are large enough to be capable of providing such benefits and small enough to feel the membership pressure. As noted above, these coops are also of the size to feel the greatest pressure from new restrictions imposed by lenders.

The average number of services offered to members declines among the largest cooperatives. This may represent a reduction in cooperative activities that is easier to implement over larger groups which cannot bring personal pressure to bear on the cooperative officers. One respondent, for instance, stated that the trend is for cooperatives to offer fewer services. Whereas 40 percent of all cooperatives said they offered services to benefit the membership, only 25 percent of the largest cooperatives said that was a reason for providing services. Instead, 80 percent of this group said they did not offer more services because the cooperative lacked expertise in such areas.

It appears that medium-sized cooperatives are feeling more pressure to provide services to members than are the smallest or the largest cooperatives, while at the same time encountering relatively more restrictions on
their own borrowing abilities. Members, who are bearing much of the weight of lender restrictions in the face of perceived changes in the risk environment, may be able to direct cooperatives to address members’ needs when the cooperative is not too large. The cooperative, therefore, provides an important service in pooling some of the risk growers face. Smaller cooperatives may lack the broad base to efficiently perform this service, and large cooperatives may not be so responsive to the individual members.

VII. Economic and Policy Implications

The theoretical and empirical results presented earlier and responses to many open-ended questions on the survey provide insight on how producers will react to perceived increases in risk and what the economic and policy implications of those factors might be. A brief discussion of the issues of concern in this new risk environment and their economic and policy implications follows.

Credit Availability

Credit restrictions, as a symptom of the new risk environment, have significant effects on many agricultural producers in California. Some people have not been able to borrow the amounts they had hoped to (question 5 in Table 2), and interest rates have become relatively higher for some borrowers in agriculture—compared to urban borrowers—due to the perceived risk differences between the sectors. It appears that many lenders have reassessed the risks involved in agriculture.

Although no lenders have completely withdrawn from the rural sector, large commercial lenders have tightened loan requirements causing some borrowers to be dropped as customers. In particular, some lenders have raised the minimum size of loans, to $750,000 in one case. This means that small scale agricultural producers will have to look elsewhere for operating capital. This, in turn, means that those people (which large lenders consider to be risky) will have to seek other sources of capital with their best prospects being small, rural
lenders. This situation creates the danger that over time rural lenders may accumulate much riskier loan portfolios than large lenders, making the rural banks more likely to fail (Sundell). To avoid such risk, rural lenders may have to turn people away, leaving some agricultural producers without sufficient capital to operate effectively.

**Drought**

The recent long drought caused natural resource use to change. Many farmers (about 11 percent, according to survey results) decided to manage water risk by putting in more wells. As a result, increased state government involvement in both surface and groundwater management may be required.

**Effective Farm Size and Productivity**

Effective farm sizes have decreased recently with water shortages. Producers facing shortages fallow marginal land because focusing inputs on fewer acres is usually more profitable than spreading those inputs too thinly across more acres. As shown in Table 1, 43 percent of owners have used this strategy within the past three years; therefore, the effective size of the farm being operated by those growers has decreased. This also explains some of the incentive for land to be leased out in the short term. Yet, the lower productivity of marginal land makes it difficult to lease out, possibly explaining the lower level of positive responses to question 3, compared to those for question 4, in Table 1. As agricultural production is eliminated on plots of land, tax revenues to the state and local governments decline because in California taxes are based, in part, on the value of products produced on that land. Although this trend in effective farm size is expected to reverse in the long term as the hypothesized new equilibrium is found, the timing of this trend adds pressure on California’s recessionary economy.

**Land Prices**

Land prices will become more correlated with crop income potential as a result of the new focus in lending on an enterprise’s expected cash flows. This could widen the range of prices for land across soil types and terrains. In
general, prices will decline in the long term due to the lower profits which are generated when producers must operate under water limitations and with increased capital costs. Three-quarters of the owners that responded positively to question 7 in Table 1 cited lower production profitability as the primary reason for the recent decline in their land values. Lower land values lead to: (1) lower property tax revenues to the state and (2) lower borrowing capacity of producers. For producers with significant debt levels, the loss of equity for use as collateral needed to borrow capital could force reductions in production, at the least, and possibly liquidation. The reduction in output would be due to reduced credit limits based on the lower equity level on a firm's balance sheet (question 5, Table 2). Liquidation might be caused if the lower level of credit will not support sufficient production to generate cash flows meeting expense levels.

More Firms at Risk

The lower level of income in the agricultural sector expected as a result of the perceived increase in risk means that there may be increased financial stress among producers. This may lead to increased demand for education and guidance on the part of those producers. Even firms able to absorb increased financial risk may experience adjustments due to the necessary shifts in enterprise portfolios (as evidenced by responses to question 6 in Table 2). Also, the entire agricultural sector may adjust its portfolio in the sense that enterprise acreages will be redistributed across the state and western region. All of these changes will add to the demand for credit. For example, to combat falling profitability, firms will need to invest in technology, thus raising the level of investment per acre which must be financed.

VIII. Summary and Conclusions

This chapter has evaluated the effects of a perceived increase in the risk environment of agricultural production in California and found that significant economic and policy implications are anticipated. Using a
portfolio model, hypotheses were derived concerning the reaction of individual producers to the shift in risk. Empirical data was collected from surveys and interviews to test whether the hypothesized reactions were, in fact, beginning to occur. From the preliminary results reported here, it does appear that agricultural producers are reacting in the rational manner hypothesized. This has significant implications for the economic well-being of California’s agricultural sector. Among those are: (1) producers will, on average, face lower incomes and/or higher levels of risk, (2) enterprise selections of individuals will be adjusted leading to acreage redistributions across the state, (3) lower income levels may increase the degree of financial stress in the agricultural sector, (4) lower incomes may cause land values to decline, thus reducing equity needed as collateral for loans, and (5) less land will be in agricultural production in the short term, leading to reductions in tax revenues to state and local governments and adding incentive to develop more land into non-agricultural uses.

It is unclear at present how significant will be the final adjustments to the perceived risk increase because the degree of new business risk perceived to exist in the agricultural sector is not yet known; the transition period is still ongoing. Yet, it is clear that successive shocks such as the recent prolonged drought and severe freeze have altered attitudes about risk in the agricultural sector and have caused risk management to become a more integral part of producers’ decision-making. This development, in turn, may lead to improved efficiency in resource use within the sector according to both theoretical and empirical observation. Unfortunately, the timing of this transition may be adding to the recessionary conditions within California’s economy. Clearly, in the short run it is adding to shifts in production from less credit-intensive to more credit-intensive crops which are viewed as being more “risky.” This, in turn, may increase the aggregate demand for credit during a period in which borrowers believe that access to credit is being tightened. As a result, individual agricultural producers and their lenders will need to maintain ever stronger lines of communication.
REFERENCES


Panel #1 Response

Mark Turmon
Producers Cotton Oil Company

My current position provides me a unique opportunity concerning supply and demand for credit because I am both a borrower and a lender. On the demand side, as a company, we borrow short-term operating needs for our services, including processing of planting seed, cotton-ginning, warehousing, transportation, and the merchandising of cotton. On the supply side, we provide crop financing to farmers who are predominately associated with production of cotton. These loans are in the form of 12-month operating loans for the production of food and fiber.

Has the lending environment changed? In my opinion, absolutely. But has the change caused a credit crunch? My answer to that is no. The so-called “credit crunch” is not the cause but the effect of the current crisis facing California agriculture. Several factors external to the agricultural economy have caused both borrowers and lenders to reevaluate their positions. These external factors include the legal issues facing the lenders today, such as changes in the banking regulations and passage of the Farm Credit Act, which includes provisions as to borrower’s rights—their right to appeal any rejection of an application. Also, changes in the bankruptcy code, including the Chapter 12 provision which provides additional protection to farmers, have caused lenders to become a bit skittish.

Another external factor is the governmental regulations faced by borrowers today. For example, they often have to use expensive attorneys just to comply with the 1990 farm bill involving ASCS programs and the CCC loan requirements. The problem is understanding these government regulations along with trying to just survive with the intensive regulations of the Clean Air Act, the Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, and the infamous Endangered Species Act.
Environmental issues have to be a concern for both the borrower and the lender. For example, the potential liability associated with hazardous waste clean up by the property owner could also include the lender in case of a foreclosure action. The urban influence on water availability for agriculture and its effect on land values also has to be considered.

Each of these external factors must be addressed, quantified and analyzed by both the lender and the borrower in order to make an informed decision evaluating the risk. These external factors—combined with limited profits in today's farming operations due to increased production costs associated with water, fuel, chemicals, and the professional help of legal counsel and accountants to help try to alleviate the paper chase—has put both the borrower and the lender in a state of complete frustration.

One of the borrowers' frustrations is the response time of the lender. The majority of our new loan business last year was the result of slow response by the traditional lender—a 45 to 60-day turnaround time for loan approval was the norm, which is unacceptable for a production loan. A grower would rather have a quick no than a slow yes.

Another frustration is turnover of loan officers. Borrowers are tired of trying to get the loan officer up to speed concerning their financial status and explaining their business and farming practices. Another frustration is the levels of approval and accountability. In today's banking environment, the front-line loan officer is merely an order taker. The loan officer can only analyze, request, and make recommendations to the individuals or committees, which have the authority to approve. The application has to go through several layers of approval—first to the local branch, then to the regional branch, and finally, it ends up at the main office in Los Angeles or San Francisco, or, for the Farm Credit System, in Sacramento. Through each step, the loan must be reviewed, approved by the next level, with each person signing off. This adds to frustration and the length of the response time.

As a borrower, one thing I am extremely concerned about is what I call the surprise loan conditions. As a
loan moves through the layers of approval, often additional conditions are attached. The borrower is surprised by these conditions which were not told to him by the loan officer at the time of application. Because loan officers have virtually no, or limited, lending authority, final negotiations as to these new conditions must go back through the levels of authority, which again delays the response time.

Once the negotiations are complete, then comes the process of legal documentation, which has increased substantially over the last several years. It is not unusual for a loan of significant size to be documented with the use of the bank’s legal counsel. Agricultural loan agreements as long as 50 pages, security documents as long as 30 pages, and 10-page promissory notes are common in today’s lending environment. The borrower must not only endure the bank’s documentation cost, but also has to bear the cost of his personal counsel to review the documents.

For borrowers, I’d like to pass along a little advice. First, start as early as you can, start laying the foundation for your next operating loan. Don’t apply for a loan on Tuesday when you know you have to make payroll on Friday. Don’t be a stranger to your loan officer. Meet with him often to discuss your business plans and ideas. I also suggest that you get to know the next several levels above your loan officer to give them a sense of your character and business management. With the additional downsizing and mergers, loan-officer turnover is not going to get any better.

Another bit of advice to the borrowers is to ask for a list of the information that your lender will require. Prepare in detail the necessary information and present it in a logical, professional, and orderly manner.

Most important, as the old saying goes, the squeaky wheel gets the grease. In the loan approval process, this is very true. During the loan application process, check in with your loan officer to update progress and ask if any additional information is required. Do not let the process get bogged down.

You, the borrower in production agriculture, are in charge; therefore, you must understand, you must plan,
and you must adjust to the current lending environment. Remember, the bankers are not your bookkeepers. The bankers are not your financial managers, and they are not your partners.

In summary, bankers do have funds to invest. Also, we as a company have funds to invest in production agriculture, although as with any business decision, our investment funds will only be shifted to viable operations in which the optimal return on investment and an acceptable level of risk can be achieved. Lenders are not in the business because they like agriculture. Lenders are involved to make a profit for their owners and their shareholders. Until there's a return to a viable and stable farm economy, including the cost of the external factors—the legal, governmental, and the environmental influences—the current trend is likely to continue.

However, one big step for agriculture in today's economy is the passage of NAFTA. In our industry, the cotton business, the United States is now the primary exporter of cotton to Mexico. Over the last two years exports to Mexico have quadrupled. This year, the exports will be above 800,000 bales. The National Cotton Council projects that if consumption in Mexico would just equal the consumption worldwide per capita, then the exports can continue to rise to exceed 2 million bales.

California agriculture, in our opinion, is viable. It is a business that will stay around. The operations that are efficient, that can adapt to change, are the ones that will survive.

Vincent Sola
Diversified Farmer

I'd like to review some banking history from my own personal experiences. At 14-years old, I had a project for FFA, and I went to a major bank to get a crop loan on it—not a very big amount of money, but it was needed. At that time, to obtain credit, there wasn't a full-fledged budget sheet to be made out, budgeting out all your costs and your projected income. A set amount of money was available, and at the end of the year, you paid it back. But there were some pretty good years about then, and it was
relatively easy to pay back the loans.

In 1976, when I rented additional land, I needed more money to farm it. The bank I was with granted me the loan, and I paid it back. We farmed that land for another seven years, until 1983. In that year the credit crunch hit. Land prices had been so inflated that in the early 80s everything started to crumble. Land prices dropped, and the banks really clamped down. I was a 100% tenant farmer, and when I went back to the same bank that I was using, they said, “We’ve changed our policies. We’re going to not be able to finance you as a tenant farmer.” We had some money saved up, and I was working with my dad. We worked it out, and I went for a couple of years self-financing.

After that, I rented some more ground, and three of us in a partnership bought an 80-acre piece of ground. I was going to farm the property, and I needed a little more money. I went to another lending institution, and since I had some property in my name, it was easier to get financing for a crop loan. That was 1987. For three years I farmed with that one banking institution. In 1991, another piece of property came up for sale. It was good soil, and it was close by, and I really wanted this piece of ground. I went back to the bank to ask for another loan for about 900 acres of ground. It was going to increase the size of my operation by three or four times. They said, “No, you’re taking too big a step, and we’re not going to do that with you—if your dad would co-sign for you, then we would go ahead.” If I failed, I didn’t want to have to put that hardship on him, too.

I found another source of financing with an independent ginning company, but one of the ramifications was that I had to raise more cotton than I had cotton base under the government program. Since I needed more cotton to get more money from the financial institution, I planted the cotton outside the program, so I wasn’t eligible for any subsidy. Luckily, in 1991, there was a time when the price of cotton went up, and I sold the cotton outside the program. We made it through that year relatively well. In 1992, we stayed with the same company, and I increased my cotton base. I was in the farm program at that point. And in ’93, I looked at
another option of going with another financial institution, so I could send my cotton to a co-op where I was able to obtain more gin returns and my bottom line, hopefully, would increase.

What I'm leading up to is that the availability of financing affects what we grow and how much we grow and who will process it—this is all part of the risk we're involved in. The financial sector has tightened down considerably. I think that's good. We're having to fill out a full-fledged budget. We know where all of our money's going. I think that's a big plus. It's helped out, and I think it will change how all farmers look at their bottom lines.

Larry Robertson
KPMG Peat Marwick

One issue I'd like to emphasize is consumer demand for healthier foods at the same or reduced costs. This is leading to more use of private labels. If you look at the statistics, you'll find that the private label market has been climbing rapidly. This is partly because of club stores, but also because of the desire to have good food at less cost. This will put pressure on processors. It will put pressure on growers through smaller returns, and it will, I think, increase the need to provide value-added products to our markets, not only here in the U.S. but world-wide.

I agree with the risks that have been outlined in the paper. I think, however, that there will be some reduced demand for credit. Some land will be taken out of production, due to the impact of water shortages and urban development. You're going to have higher productivity—hopefully with some price increases to the producer—and new technology that will help reduce the demand for credit. I agree that producers will gradually change to higher value crops, which use less water, require less labor, and have, hopefully, lower price volatility.

It is very important for you to know that bankers, insurance companies, and other financial sources are looking at cash flow, cash flow, cash flow. If I could recommend one thing to producers, it would be to pick up this document—Recommendations of the Farm Financial
Standards Task Force, Financial Guidelines for Ag Producers, published in 1991, updated every year. It has guidelines for financial statements, for how things should be accounted for, for what the ratios the bankers look at really mean, for how to develop cash flow statements. I have talked to bankers, and they emphasized over and over that they want financial statements prepared in accordance with generally accepted accounting principles. They want accrual basis, they want cash flows, and they do not want to help with budgets.

One concern of mine is that I have run into more and more bankers and loan representatives with insurance companies who don’t know anything about agriculture. They don’t know anything about processors. They don’t know anything about cooperatives. I think that is a major issue—the fact that we do not have loan officers who know agriculture.

I think we are going to see other financing sources playing a more prominent role than they do today. Two are the processors and the cooperatives. I think we are going to see more producer loans and advances from these sources, even though it can be a major risk for the company. The co-op or the processor has better access to funding, which they, in turn, can lend to their members.

It seems that strategic alliances may become more important to processors and, directly and indirectly, to producers—in which companies or organizations or growers team up to share costs, fund joint research efforts, or to just produce crops. We saw that about two years ago when a cooperative in this state joined up in a strategic alliance with a major brand company product line. It was a win-win for the growers, for the co-op, and for the major company. We’re going to see more of that. We probably will see more limited partnerships formed to finance plants, etc., and more use of brokers of equity investments.

The advent of risk-based deposit insurance premiums has been mentioned. Once those get phased in, in 1995, there will be added pressure on the commercial banking system because of its reliance on deposit insurance. When you add the factor of risk-based deposit insurance to risk-based capital standards it means that the avail-
ability of credit coming from those sources may have limitations that we weren’t accustomed to in the past.

We have unregulated lenders; the insurance business is trying to stave off federal regulation by going to self-imposed credit standards. It’s too early to tell whether or not that will succeed, but they’re certainly trying hard. Keep in mind that with the risk-based capital standards that we all now face, agriculture has to do a better job of making its case in the banking system, so that they can continue to have good credit availability at good prices.

Joseph C. Garcia, Jr.
Diversified Farmer

Steve Blank’s conclusions, I think, accurately portray where a lot of agriculture is today—profitability is declining. My database goes back 12 years. I calculate a per-box average for the more than 50 different varieties of peaches, plums, and nectarines we produce, and the 12-year average is higher than the five-year average. In the last five years we’ve made less money per box than we did in the average over the entire 12. And that’s just one example.

As a farmer of permanent crops, we’re in a Catch 22. The bankers and regulators tell us that we need to change rapidly, but with permanent crops you don’t change that quickly—you need a little more lead time.

I don’t know if there are any regulators in the audience, but bankers probably get about as much lead time as farmers do—you just know about it more quickly. In any case, we really need to find a way to stretch out the time required to change.

As a peach grower, I always thought I was in a not very risky business and the same with raisin growing. To have fruit and nuts defined as riskier was a bit of a shock. In that respect, our learned friends from the University are correct in that farmers really don’t understand your definition of risk. When we got out of cotton, my dad said cotton was a risky business because it’s so easy to get in and out of; it’s better to grow a crop that’s harder to get in and out of, so the risk would be leveled out over time.

Talking about risk, I think that farmers decide we’re
not going to worry about what we can’t do anything about and work on what we can. For most of the things we can’t work on, we do the best we can. We don’t ignore them, but we adapt to them as they happen, rather than trying to think of ways to avoid them ahead of time. I hope I don’t step on any body’s toes, but most crop insurance, from my experience, isn’t worth much because of the way the losses are paid. For example, if you harvest raisins for a week or longer, you’re not going to get anything for rain damage because it usually doesn’t rain for more than two or three days, and you only lose a fraction of the crop. On the other hand, rain and hail insurance on apricots and plums makes some sense because they pay you in proportion to your losses. Bankers say “You will get crop insurance.” And I say “Why? I’m wasting our money.” They say, “It’s in our rules. You have to have crop insurance.” So I buy it, but when they don’t tell me I have to buy crop insurance, I don’t.

Some of the other risk management ideas that were put out obviously don’t work on the 250 specialty crops that we grow in California. You can’t get forward contracting, you can’t do hedging, the government programs don’t exist, with a couple of exceptions. But I’m a firm believer in marketing orders, which are one thing that farmers can do to manage their risk effectively. You can get together to explore alternative marketing methods, production methods, alternatives to pesticides, promoting your crop, setting minimum standards, and in a few cases, you can even control the supply a little bit.

We are told over and over again to develop and sell quality products. The problem is nobody can agree on what’s a quality product. Is it something that’s bigger, redder, tastier? Is it something that’s pesticide free? Is it organic?

Banks have a real problem meeting the needs of agriculture. I think you want to do it; we certainly want you to. We need to work together to understand each other’s problems. We must figure out how we can live with our common lending environment. If we don’t, other financial institutions, possibly individual lenders, will take over the business. And given their different level of regulation, I’m not sure that’s what we want.
The Supply of Credit to Agriculture

Karen Klonsky, Steven C. Blank, Robert C. Thompson, Jr., Thomas W. Hazlett, and Lawrence Shepard

I. Introduction

The rapid expansion of the agriculture sector in the 1970s was financed largely by a dramatic increase in agricultural debt. In California, credit to agriculture increased from $4.1 billion to $15.7 billion, an increase of 285 percent over the decade, and continued to expand until 1984 (Table 1). This contributed to over-capitalization of the sector. Land prices were driven to levels that were not sustainable from farm income. As prices for many commodities tumbled and agricultural real estate values corrected, the demand for credit decreased. There was a strong reaction to the decline in real estate values by agricultural lenders and by Congress that made the adjustment even sharper than the increase. The result was higher lending standards throughout the industry.

The authors thank T. J. Wyatt, UC Davis, and Carole Nuckton, Oregon State University, for their assistance in preparing this paper. They also thank Marilyn Whitney, UC Davis, for her review comments.
<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th></th>
<th>California</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nonreal Estate Debt</td>
<td>Real Estate Debt</td>
<td>Total</td>
</tr>
<tr>
<td>1965</td>
<td>16,900</td>
<td>18,900</td>
<td>35,800</td>
</tr>
<tr>
<td>1966</td>
<td>18,500</td>
<td>20,700</td>
<td>39,200</td>
</tr>
<tr>
<td>1967</td>
<td>19,600</td>
<td>22,600</td>
<td>42,200</td>
</tr>
<tr>
<td>1968</td>
<td>19,200</td>
<td>24,700</td>
<td>43,900</td>
</tr>
<tr>
<td>1969</td>
<td>20,000</td>
<td>26,400</td>
<td>46,400</td>
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<td>1970</td>
<td>21,200</td>
<td>27,500</td>
<td>48,700</td>
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<td>24,000</td>
<td>29,300</td>
<td>53,300</td>
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<td>1972</td>
<td>26,700</td>
<td>32,000</td>
<td>58,700</td>
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<td>1973</td>
<td>31,600</td>
<td>36,100</td>
<td>67,700</td>
</tr>
<tr>
<td>1974</td>
<td>35,100</td>
<td>40,800</td>
<td>75,900</td>
</tr>
<tr>
<td>1975</td>
<td>39,700</td>
<td>45,400</td>
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<tr>
<td>1976</td>
<td>45,570</td>
<td>50,496</td>
<td>96,066</td>
</tr>
<tr>
<td>1977</td>
<td>52,410</td>
<td>58,445</td>
<td>110,855</td>
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<tr>
<td>1978</td>
<td>60,683</td>
<td>66,707</td>
<td>127,390</td>
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<tr>
<td>1979</td>
<td>71,847</td>
<td>79,704</td>
<td>151,551</td>
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<tr>
<td>1980</td>
<td>77,132</td>
<td>89,692</td>
<td>166,824</td>
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<tr>
<td>1981</td>
<td>83,593</td>
<td>98,788</td>
<td>182,381</td>
</tr>
<tr>
<td>1982</td>
<td>86,996</td>
<td>101,809</td>
<td>188,805</td>
</tr>
<tr>
<td>1983</td>
<td>87,888</td>
<td>103,176</td>
<td>191,064</td>
</tr>
<tr>
<td>1984</td>
<td>87,091</td>
<td>106,691</td>
<td>193,782</td>
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<tr>
<td>1985</td>
<td>77,524</td>
<td>100,658</td>
<td>178,182</td>
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<tr>
<td>1986</td>
<td>66,563</td>
<td>90,397</td>
<td>156,960</td>
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<tr>
<td>1987</td>
<td>62,047</td>
<td>82,704</td>
<td>144,751</td>
</tr>
<tr>
<td>1988</td>
<td>61,734</td>
<td>77,634</td>
<td>139,368</td>
</tr>
<tr>
<td>1989</td>
<td>61,826</td>
<td>75,359</td>
<td>137,185</td>
</tr>
<tr>
<td>1990</td>
<td>63,080</td>
<td>73,702</td>
<td>136,782</td>
</tr>
<tr>
<td>1991</td>
<td>64,308</td>
<td>74,446</td>
<td>138,754</td>
</tr>
<tr>
<td>1992</td>
<td>63,000</td>
<td>75,028</td>
<td>138,028</td>
</tr>
</tbody>
</table>

Source: USDA, Economic Indicators of the Farm Sector, various issues.
coupled with tighter regulation of all types of lenders. Consequently, there has been a perceived limitation of credit availability to agriculture. Nonetheless, net borrowing by the farm sector has risen since 1988 in both the U.S. and California. This paper will discuss the current credit situation in agriculture, the events that led to the current situation, and prospects for the future.

II. Sources of Credit

Several sources, including commercial banks, the Farm Credit System (FCS), insurance companies, Farmers Home Administration, (FmHA) rural development corporations, agribusiness firms, and individuals provide credit to farmers. These groups often work in coordination with each other to develop otherwise unavailable loan products. The following sections describe each of these types of lenders.

Commercial Banks

Commercial banks are involved in extending credit to agriculture in several ways which vary according to size, specialization and type of organization. Banks play a major role in agricultural finance through direct loans to growers, financing of agribusiness and international trade, participation among banks, and purchases of securities sold by the Farm Credit System.

Banks are profit making corporations owned by stockholders. As such, they make investments with consideration of profitability, risk, and liquidity. The major uses of funds are (1) loans, (2) reserves, (3) investments, and (4) services. Reserves consist of primary and secondary reserves. Primary reserves satisfy regulatory requirements and are calculated as a percentage of total assets. Secondary reserves are interest bearing and are held to maintain liquidity to meet variations in bank business activities.

Banks' investment in various types of securities such as U.S. government bonds, U.S. agency bonds, and municipal bonds. Investments generally have a longer term and higher interest rate than reserves. Investments
<table>
<thead>
<tr>
<th>Table 2. Assets and Liabilities for California Commercial Banks for the Quarter Ending March 31, 1993</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS</strong> Total: 324,176</td>
</tr>
<tr>
<td>Foreign: 26,438</td>
</tr>
<tr>
<td>Domestic: 297,738</td>
</tr>
<tr>
<td><strong>LOANS</strong> Total: 223,699</td>
</tr>
<tr>
<td>Foreign: 26,644</td>
</tr>
<tr>
<td>Domestic: 197,054</td>
</tr>
<tr>
<td>Real Estate: 116,483</td>
</tr>
<tr>
<td>Commercial: 39,235</td>
</tr>
<tr>
<td>Consumer: 27,481</td>
</tr>
<tr>
<td>Agriculture: 2,803</td>
</tr>
<tr>
<td>International: 77</td>
</tr>
<tr>
<td><strong>SECURITIES</strong> Total: 40,423</td>
</tr>
<tr>
<td>USTS: 11,842</td>
</tr>
<tr>
<td>Secondary Market: 23,193</td>
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<tr>
<td>Other Sec.: 5,388</td>
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<tr>
<td><strong>LIABILITIES</strong> Total: 297,278</td>
</tr>
<tr>
<td>Domestic: 270,935</td>
</tr>
<tr>
<td><strong>DEPOSITS</strong> Total: 265,750</td>
</tr>
<tr>
<td>Foreign (Residual): 24,498</td>
</tr>
<tr>
<td>Domestic: 241,252</td>
</tr>
<tr>
<td>Demand: 61,820</td>
</tr>
<tr>
<td>Time &amp; Savings: 179,432</td>
</tr>
<tr>
<td>NOW: 24,508</td>
</tr>
<tr>
<td>MMDA: 55,902</td>
</tr>
<tr>
<td>Savings: 27,193</td>
</tr>
<tr>
<td>Small Time: 39,464</td>
</tr>
<tr>
<td>Large Time: 22,291</td>
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<tr>
<td><strong>OTHER BORROWINGS</strong>: 14,143</td>
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<tr>
<td><strong>EQUITY CAPITAL</strong>: 26,897</td>
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<td><strong>LOAN-LOSS RESERVE</strong>: 7,599</td>
</tr>
<tr>
<td><strong>LOAN COMMITMENTS</strong>: 121,232</td>
</tr>
<tr>
<td><strong>LOANS SOLD</strong>: 14,805</td>
</tr>
<tr>
<td><strong>NUMBER OF BANKS</strong>: 447</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Regional Bank Data
are generally very liquid because of secondary markets. Fluctuation in market interest rates impacts the value of the securities and causes the major source of risk in bank investments.

Loans comprise the majority of bank assets (Table 2). The expected returns from lending are higher than that for investments or reserves but carry the greatest risk. A bank faces two sets of decisions with respect to loans. First, it must allocate funds among categories of potential borrowers. Second, it must make loan decisions among borrowers within the loan categories. Therefore, both the availability to the sector and the availability to subcategories of borrowers within the sector must be examined when analyzing credit availability to agriculture. Both types of decisions are made with concern for profitability and risk.

More than 100 banks in California loan to agriculture out of a total of 447 banks. Loans comprise 70 percent of these banks' assets (Table 2). Of these, 52 percent are real estate loans, 18 percent commercial, 12 percent consumer, 1 percent agricultural and less than 1 percent international. Therefore, although almost one quarter of all commercial banks in California participate in agriculture, it comprises only a small part of total assets. Consequently, changes in the real estate market and employment strongly influence bank performance. Agriculture provides opportunities for diversification and increasing market share.

The average interest rate on loans to agriculture in California as of May, 1993 was 6.63 percent at an average maturity of 14 months (Table 3). This is lower than the national average of 7.52 percent and 15 months for average maturity. Of course, the portfolios and loan characteristics of individual banks vary by size, business orientation, and bank policy.

The structure of the banking system in California, which has long included branch banking, provides access to capital for rural communities. In contrast, other parts of the country rely on community agricultural banks as the primary source of funds for agriculture.\footnote{The Federal Reserve System defines an agricultural bank as one for which the ratio of farm loans to total loans exceeds 16.6 percent.} These
Table 3. Interest Rates on Loans as of May 1993

<table>
<thead>
<tr>
<th></th>
<th>United States</th>
<th>California</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMERCIAL SHORT-TERM</td>
<td>Avg. Rate</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Avg. Term. (days)</td>
<td>50</td>
</tr>
<tr>
<td>COMMERCIAL LONG-TERM</td>
<td>Avg. Rate</td>
<td>6.32%</td>
</tr>
<tr>
<td></td>
<td>Avg. Term (mos.)</td>
<td>42</td>
</tr>
<tr>
<td>LOANS TO FARMERS</td>
<td>Avg. Rate</td>
<td>7.52%</td>
</tr>
<tr>
<td></td>
<td>Avg. Term (mos.)</td>
<td>15</td>
</tr>
<tr>
<td>CONSUMER, AUTOMOBILE</td>
<td>Avg. Rate</td>
<td>8.17%</td>
</tr>
<tr>
<td>CONSUMER, PERSONAL</td>
<td>Avg. Rate</td>
<td>13.63%</td>
</tr>
<tr>
<td>CONSUMER, CREDIT CARDS</td>
<td>Avg. Rate</td>
<td>17.15%</td>
</tr>
</tbody>
</table>

Source: Survey of Terms of Bank Lending: Terms of Consumer Credit

banks depend on local deposits for capital and are more vulnerable than larger banks to local economic conditions, in general, and the health of local agriculture, in particular.

The three largest agricultural portfolios in the U.S. are held by banks based in San Francisco, one of the country’s largest money centers. Yet agriculture comprises a relatively small percentage of these banks’ total portfolios: Bank of America—1.9 percent, Wells Fargo—2.4 percent, and Sanwa—11.5 percent (Federal Reserve System). The diversity of assets held by banks in California has significantly impacted lending practices for agriculture.

Local banks primarily provide short-term credit for production loans. The primary source of funds is deposits in the bank. Therefore, local banks try to encourage their borrowers to deposit their profits back in the bank. In fact, loan fees and the interest rate may be reduced when there is a full banking relationship. The fact that the primary source of funds is deposits limits the size of the loans that local banks can make. Further, community banks try to provide full services to the agricultural community. For these reasons some local banks have been very aggressive in trying to attract farm customers with moderate credit needs.

Banks avoid funding long-term loans with highly-liquid deposits. From a bank management perspective,
the short-term characteristics of the sources of funds (i.e. deposits) do not match the long-term characteristics of the use of funds (i.e. real estate loans). Further, regulations limit the amount of money a bank can loan relative to its assets. However, some local banks increase their long-term loan volume by selling their loans to insurance companies. This relationship will be discussed in more detail under the Life Insurance Company section.

Farmer Mac

The Federal Agricultural Mortgage Corporation (Farmer Mac) operates independently, yet a government guarantee supports its securities. Congress designed Farmer Mac to create a secondary market for farm mortgage loans. This secondary market increases the availability of long-term credit to farmers by providing greater lending capacity to various types of farm lending institutions.

In a secondary market, agricultural mortgage marketing institutions (commercial banks, Farm Credit System institutions, investment companies, insurance companies, etc.) buy loans, pool them, and then sell securities in the form of bonds. Farmer Mac oversees these transactions and guarantees 90 percent of the value of the securities. The remaining 10 percent, known as the subordinated debt, absorbs the risk for the rest of the security. Rarely would more than 10 percent of the security value erode since loans are pooled from all over the country and for various types of farming operations. Historically, overall agricultural mortgage default rates have never exceeded 10 percent. Therefore, the holder of the 10 percent subordinated debt assumes virtually all of the risk.

Nonetheless, the creation of secondary markets for farm mortgage loans theoretically allows banks that have short-term funding in the form of deposits to make long-term loans. It also enables insurance companies to lend more in agriculture than they could otherwise. Finally, it allows poolers to combine loans to reduce risk. The activity in this market has been relatively low so far (over $600 million), but it is too soon to predict how substantial the impact will be on agricultural credit.
Life Insurance Companies

The primary financial activities of life insurance companies include the sale of insurance policies and payment of claims to policy holders which result in the accumulation and holding of large financial reserves. Life insurance companies seek long-term, low-risk investments to match the long-term characteristic of their assets. The involvement of life insurance companies in agricultural lending varies significantly from company to company. Loans may be made directly through a company office or through an agent such as mortgage brokers, real estate companies, or commercial banks. Insurance companies active in California include John Hancock Mutual Life, Prudential Life (through subsidiaries Pru Ag and Pru Securities), Travelers, Equitable, Metropolitan Life, and Mutual of New York.

Local banks affiliated with insurance companies use the forms and underwriting standards from the insurance company when making loans. After a loan is made the bank sells the loan to the insurance company, thereby replenishing the bank’s assets. The bank continues to service the loan and keeps the loan origination and servicing fees as earnings while the interest payments go to the insurance company. The relationship with the insurance company allows the bank to increase their volume of business and reduce risk exposure. At the same time the insurance company lowers servicing overhead costs for the loans and spreads its risk exposure over a large geographic area. The insurance company also has the option of pooling the loans and selling them through Farmer Mac.

For example, Prudential Life Insurance works with about 80 banks representing virtually every agricultural region in the U.S. including several banks in California—Feather River State Bank, Bank-One, Bank of Merced, San Joaquin Bank, Valley Independent Bank, California Valley Bank, and Bank of the Sierras. The networking of banks adds another product that a full service bank can offer its customers with little additional overhead. Although most of the loans are not pooled, Prudential made its first Farmer Mac sale in June 1992.

Insurance companies grant most of their common
loans for seven, ten or 15 years with a balloon payment at the end. This means that the loan is not fully amortized at the end of the loan period, and substantial outstanding principal still exists. Most people tend to refinance at the end of the loan or sell the property at that time. The longer the length of the loan, the greater the risk exposure for the lender and the higher the interest rate. The interest rate for a given loan term can vary about 0.7 percent based on the quality of the loan. Theoretically, a loan can be 75 percent of the appraised value, but generally, the insurance company grants loans for 60 percent of the value.

**Farmers Home Administration**

The Farmers Home Administration (FmHA), an agency of the U.S. Department of Agriculture, provides loan guarantees and direct loans to family farmers who are unable to otherwise obtain credit from the commercial sector. FmHA guarantees loans from commercial banks and the FCS for up to 90 percent of the loan and interest. A few years ago FmHA began moving away from direct loans and increasing the loan-guarantee program.

Besides reducing risk exposure, the loan-guarantee program increases the legal lending limits of banks because guaranteed loans do not get figured into the ratio of unsecured debt to deposits. It should be kept in mind that the FmHA guarantee is a "loan-loss" guarantee that protects the lender and not a "loan" guarantee that assures available funds to the borrower. As such, the guarantee, like a cosigner, is a proxy for collateral.

FmHA programs include operating loans and farm ownership loans. Repayment terms range from one to seven years for direct loans. The lending institution negotiates the term and interest rate for guaranteed loans. The FmHA limits loans to $200,000 for direct loans, $300,000 for guaranteed ownership loans, and $400,000 for guaranteed operating loans.

If a borrower qualifies for a loan in all ways except cash flow with the normal FmHA interest rate, then the borrower may qualify for the "limited resource interest rate" which is usually about three percentage points below the going rate. The loan can be made if the reduced
rate results in a positive cash flow. The loan-guarantee program includes a similar provision called "interest assistance." FmHA will subsidize interest payments up to four percentage points if it will improve cash flow to the point of making the loan acceptable to the lending institution. Critics of this provision claim that if a loan is that close to being unacceptable then it is too risky even with the interest rate subsidy.

Other critics of the loan guarantee program cite paperwork and government bureaucracy as deterrents from using the program. However, FmHA will give qualifying lending institutions "preferred lender status" which allows them to use their own forms instead of FmHA's. This removes a lot of the work out of the application.

Farm Credit System

Congress authorized the Farm Credit System (FCS) in 1916, creating a cooperative system of 12 Federal Land Banks. The original mandate was to provide farmers with long-term real estate mortgage loans at more reasonable terms than other lending institutions. Currently, the FCS makes loans through three types of associations. Production Credit Associations (PCAs) make operating and equipment loans and Federal Land Bank Associations (FLBAs) make real estate loans. Agricultural Credit Associations (ACAs) provide real estate loans as well as operating and equipment loans. ACAs resulted from the merger of a PCA and a FLBA in the same geographic area in an attempt to make the Farm Credit System more efficient. The Farm Credit Administration charters, supervises, and examines the banks and associations that make up the FCS. The Farm Credit Administration gains its authority from the Farm Credit Act of 1971, as amended in 1985.

The FCS receives most of its funding through the sale of bonds and notes. Most bonds are issued in denominations of $5,000. Typical bonds mature in six months but vary in maturity when the FCS is trying to match the term of their sources of funds to their loan portfolio. Notes mature between five and 270 days and sell in denominations of $50,000.
The major source of the FCS's equity capital is the sale of stock to borrowers. FCS loans include a stock ownership requirement. In practice, borrowers finance their stock purchases by borrowing additional amounts. The stock requirement increases the annual percentage rate of interest over the contractual rate. For PCAs the stock-purchase requirement varies among associations in the Western district between two and ten percent of the amount borrowed. For FLBAs it varies from six to ten percent. Loans usually require the purchase of stock. The borrower can sell the stock as the loan is repaid. There is also an up-front loan fee that is the same regardless of the size of the loan. Technically, FCS could sell loans through Farmer Mac but because of current market conditions has only recently elected to do so. The Western District Farm Credit System entities met with Farmer Mac representatives in December 1992 to discuss possible sales.

FCS loans can also take advantage of FmHA loan guarantees. This proves to be a useful tool in some cases. However, FmHA will not guarantee a loan that is rolled over so a delinquent loan has to be restructured with a new promissory note before a guarantee can be made. In addition to meeting all FmHA requirements, borrowers still have to meet the FCS minimum standards.

Once a borrower's long-term performance is established, the loan requires only annual information, and the credit check and verification are not as involved as they are for a new borrower. In an attempt to better service small farmers and reduce costs, the FCS developed a short form about ten years ago and streamlined the credit write up. This has helped reduce the costs of smaller loans.

Another tool used to help borrowers is extended maturity. A revolving line of credit for a production loan can be made for up to a four-year period, thereby eliminating the need to re-document every year and reducing costs of making the loan. Only the annual financial statements and annual crop progress reports need updating. The borrower also avoids having to pay the application fee each year. However, multi-year production loans can be problematic because growers cannot be flexible in what they plant.
Trade Credit

Sellers of inputs and buyers of agricultural production offer credit to producers to finance operating expenses. Firms selling equipment, fertilizer, seed, pesticides or buildings usually provide credit through open accounts. The farmer purchases inputs without making immediate payments. The added credit service attracts customers and differentiates products from competitors.

Annual inputs may or may not include an interest charge. Billing typically occurs in 30, 60, or 90 days. Farmers find these loans very convenient, particularly because they require much less paper work than loans from other types of lenders. One disadvantage is that the terms of the loan are less flexible than with other sources of credit. The interest rates from trade credit are not comparable to FCS or bank rates since they relate directly to sales of commodities and production inputs.

By far the most common type of trade credit comes from equipment dealers. These loans require installment payments and more complete loan documentation and analysis of repayment ability.

Firms buying commodities on contract commonly sometimes offer advances to their growers, particularly if the commodities are in high demand.

Individuals

Individuals typically provide credit through land contract real estate sales. The buyer of the property has full use of the property while the seller retains the title. Often individuals offer loans with terms of ten to 15 years with a large balloon payment at the end. This type of arrangement provides the seller with a steady flow of income at relatively high interest rates without the tax burden of a complete sale. This type of financing involves relatively low risk because the seller retains the title until the payments are completed. The buyer purchases land without going through an extensive loan process. The interest rate generally lies below rates from other credit sources.

Individuals make a certain amount of operating loans to farmers, but these loans are generally within families.
Market Share of Lender Types

The latest available numbers reveal that almost half of the market share for the $5.9 billion of nonreal estate farm debt in California belonged to commercial banks (49 percent) (Figure 1). The other major nonreal estate lenders in the state in 1992 include the FCS (19 percent), individuals and others (19 percent), the FmHA (7 percent), and the Commodity Credit Corporation (7 percent).

The largest holder of the $7.6 billion in real estate debt in 1992 was the FCS (35 percent) followed by life insurance companies (30 percent), individuals and others (17 percent), commercial banks (15 percent), and the FmHA (3 percent) (Figure 2). The distribution of market share has changed significantly over the past several decades. The FCS expanded its share of the market until 1985 and then gave up market share to government agencies (the FmHA and the CCC) and commercial banks.

The FCS held only 8 percent of the California nonreal estate debt in 1960, peaking at 27 percent in 1985 and then declining to 19 percent by 1992. The FmHA held less than one percent of nonreal estate debt in 1960, increasing to a significant percentage in 1970 and holding steady. Individuals and others held 42 percent in 1960. Their role has steadily declined to only one-fifth of all nonreal estate debt today. The role of commercial banks has been less variable, fluctuating around 50 percent and peaking in 1972 at 60 percent.

The picture for real estate debt looks quite similar. The FCS held 13 percent of real estate debt in 1960, increasing to 44 percent in 1986 and decreasing to 35 percent by 1992. Life insurance companies held only 14 percent of the debt in 1960, steadily increasing to 29 percent in 1978, dropping to 22 percent in 1981, and increasing again to 30 percent by 1992. Individuals’ involvement has steadily decreased from two-thirds in 1960 to 14 percent in 1992, replaced, in part, by commercial banks.

Although the proportion of farm debt held by commercial banks has increased since 1987, the proportion of bank loan portfolios in agriculture has decreased steadily in both the United States and California (Table
Figure 1. Distribution of Nonreal Estate Farm Debt by Lending Source
California

Source: USDA, Economic Indicators of the Farm Sector
Figure 2. Distribution of Real Estate Farm Debt by Lending Source

California

Source: USDA, Economic Indicators of the Farm Sector
Table 4. Agriculture Loans as a Percentage of Total Loans for Commercial Banks: United States and California

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<td></td>
<td>(in millions)</td>
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Source: Federal Reserve Regional Bank Data; USDA, Farm Business Balance Sheet, 1960-1992

4). This can be explained by the fact that the volume of loans to agriculture has increased at a slower rate than banks' total loan portfolios.

In order to understand these changes in market share and the changes in volume, one must analyze at the economic performance of the farm sector, the credit system and the general economy, and compare that to government response.

III. An Historic Perspective

The past three decades have been boom, bust, and rebuilding periods for agricultural credit. A brief summary follows.

The 1970s Expansion

Several factors came together in the 1970s to create a strong farm economy and stimulate investment in agriculture. The dollar was taken off the gold standard and allowed to float, lowering its value abroad. This made U.S. farm exports cheaper and thus stimulated export demand. Rapid inflation, resulting in part from expansion of the money supply to pay for Great Society
programs and the Vietnam War, pushed up commodity prices.

U.S. agricultural debt from all sources nearly quadrupled between 1970 and 1984, from $49 billion to almost $194 billion (Table 1). In real terms, the credit expansion during this highly inflationary period peaked in 1979 at 60 percent, five years earlier than the peak nationwide.

California farm debt also quadrupled from 1970 to 1984, increasing from $4 billion to $17 billion. This increase of 70 percent (in real terms) peaked in 1983, four years after the peak on a national level.

Lenders faced strong demand from investors with a great deal of equity and/or outside income. Large down payments enabled loans to cash flow, thus inflating land values. In other cases lenders evaluated real estate appraisals based on comparable sales and not income capacity, making loans to agriculture attractive. In a highly competitive market, lenders refused to turn away business that they knew their competitors would be happy to accept. And so the upward spiral existed on the supply and demand side of the credit market.

Many growers saw land prices increasing and wanted to buy land before it became even less affordable. Expectations of continued inflation and low real interest rates encouraged investment. The investment activities of neighbors also fueled expansion.

At the same time, groups outside the sector invested in agriculture to take advantage of tax laws favoring agriculture. Capital gains laws encouraged speculation in agricultural land unrelated to productive capacity. Investors purchased land and turned over short-term profits at relatively low tax rates. Limited partnerships allowed individuals outside agriculture to receive tax write-offs on farming expenses while protecting nonfarm income.

The ability to depreciate trees as a tax write-off enticed investors to plant permanent trees and vines in California. Other tax laws allowed investment in citrus and almond orchards to be capitalized before the orchards came into bearing, providing an even more attractive tax shelter for high income investors. As one expert put it, trees were planted "behind every rock."
Expansion in agriculture meant bringing poorly suited land into production simply because it was the most available, and it resulted in higher operating costs per unit of output and an oversupply of commodities. These factors, coupled with the fact that land values had risen above their repayment capacity, made agriculture extremely vulnerable to exogenous shocks affecting demand.

**The Downward Adjustment**

In the early 1980s a worldwide recession curtailed demand for agricultural products, while a stronger dollar made U.S. exports more expensive abroad. U.S. agriculture's increasing productivity resulted in excess capacity and burgeoning, price-depressing stocks. The Green Revolution meant that many importing countries became net exporters of wheat and grain, adding to the world stocks. Lower-cost production areas began exporting to the United States, adding to already large supplies. Prices of all major commodities plunged.

At the same time, increasing input prices, bid up by the inflationary boom, squeezed farmer's profits and the Fed raised interest rates to control inflation, making interest the biggest cost increase to farmers. Many borrowers were unable to keep up payments on existing debt. Foreclosures forced many (about one in five nationwide) out of business.

Real estate values dropped precipitously (Table 5). Among California's diverse agricultural properties, certain sectors were hit harder than others (Figure 3). Real estate values for annual cropland, pasture and range increased significantly from 1980 to 1984. In 1985 and 1986, land values returned to their 1980 values. Since then, the price of land in these sectors has risen slowly but steadily.

In contrast, fruit and nut acreage values rose dramatically during the early 1980s, fell from 1984 through 1987 and steadied at 1970s values. This is significant because the prices received for fruit and nut crops held steady and even increased, suggesting that the correction in land prices could be attributable to factors other than income in these industries. The general
Table 5. California Land Values by Commodity and Region (Dollars per Acre)*

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<td>VINEYARDS</td>
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<td></td>
<td></td>
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<td>Wine Varieties</td>
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<tr>
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<td>7900</td>
<td>4680</td>
<td>5200</td>
<td>5600</td>
<td>5600</td>
<td>5400</td>
<td></td>
</tr>
</tbody>
</table>

a/ Includes land used for cotton, sugar beets, rice, etc.
b/ Includes land used for barley, beans, corn, and sorghum
c/ Unimproved
* Excludes non-bearing acreage and farm buildings
Source: California Agriculture Statistical Review, various years

implication is that factors other than commodity prices undoubtedly played an important role in declining land values in general. The rate of returns on assets from current income declined from 1978 through 1983 but remained above five percent in California. They rose to about ten percent by 1987, above the returns received through most of the 1970s, demonstrating the general
Figure 3. Selected Real Estate Values in the San Joaquin Valley

Source: California Agriculture Statistical Review, various issues.

Figure 4. Rates of Return on Assets from Current Income for the United States and California

Source: USDA, Farm Sector Financial Ratios, 1960-91
profitability of agriculture throughout the 80s (Figure 4). However, the negative rate of return on assets from capital gains from 1981 through 1987 reflects the losses realized through the downward adjustment in real estate values.

Second, the value of orchard property exceeds the value of field crops and range land on a per-acre basis. Therefore, the drop in orchard values was not only greater than other land values on a percentage basis but also in absolute terms. This pulled down the average land values in California even though rangeland, pasture, and field crop values were approximately the same in 1985 as they were in 1980 before the temporary escalation.

As agricultural real estate values corrected, the demand for credit declined. The rates of return on assets from capital gains in California plummeted from a high of 17 percent in 1978, to negative 13 percent in 1986 (Figure 5). Farmers paid down debt as lenders wrote off bad loans. The major charge-offs occurred between 1984 and 1987 in both California and the U.S. as a whole (Figure 6). The charge-offs in California peaked in 1986 when almost eight percent of all loans to agriculture were charged off (Figure 6). This is compared to only four percent of all agricultural loans on a national level.

California banks diversify more than the Midwest banks and other banks in large agricultural states. Government assistance for agricultural banks (then defined as banks with more than 15 percent of assets as loans to agriculture) only applied to one bank in California. For these reasons, California banks charged-off more loans. At the same time delinquent loans in California exceeded those in the U.S., peaking in 1987 (Figure 7).

There was an absolute decline in farm debt both in the U.S. and in California. U.S. farm debt dropped from $193 billion in 1984 to $138 billion in 1992. In California, debt declined from almost $17 billion in 1984 to just over $13 billion in 1992 (Table 1).

On a national basis, farm debt also fell relative to total debt for all sectors from five percent of total U.S. debt in 1983 to less than two percent in 1991. In particular, debt from businesses other than farming grew from $1.6 trillion in 1983 to $3.5 trillion in 1991 (Federal Reserve Bulletin, various issues).
Figure 5. Rates of Return on Assets from Capital Gains for the United States and California

Source: USDA, Farm Sector Financial Ratios, 1960-91

Figure 6. Percent of Total Loan Chargeoffs for U.S. and California Commercial Banks

Source: Federal Reserve Regional Bank Data
Redesigning the System

Lenders and Congress reacted strongly in the late 1980s to the decline in real estate values. This reaction may have precipitated an even faster decline in the supply and demand agricultural credit. Lenders faced deteriorating portfolios while Congress passed legislation that lengthened the process of cleaning up loan portfolios. Lenders found themselves in the untenable situation of taking back agricultural properties and equipment in foreclosure or in lieu of foreclosure that they were not prepared to manage. Public auctions reminiscent of the Great Depression were were held. The event damaged public relations for the lenders and real estate values continued to decline.

IV. The Current Situation

The current agricultural credit situation involves a number of factors in a state of flux. Some of the most significant are outlined in the following sections
Regulations

The Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency (OCC), the Federal Reserve Board (FRB), and state banking authorities regulate depository institutions.

The deregulation of financial markets in the 1980s affected the competitive structure of these markets. In particular, federal legislation phased out interest rate ceilings on deposits, reduced reserve requirements, and increased federal insurance coverage. The reduced reserve requirements freed assets for lending. The elimination of interest rate controls meant greater competition among banks and greater risk taking. The riskier activities in the face of increased federal deposit insurance led to numerous bank failures. A general credit contraction followed, lasting from 1988 to 1992.

In response to the taxpayer bailout of savings and loans institutions and illiquidity within the banking sector, Congress instituted regulatory changes in an effort to stop bank failures and shore up the Bank Insurance Fund (BIF). The Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) allowed the FDIC to borrow $75 billion that the banking industry will ultimately repay, in large part, with assessments on insured domestic deposits.

The assessment base for deposit insurance has changed several times since 1933. Changes in the assessment base alter the burden of covering losses. In particular, foreign deposits and nondeposit liabilities (such as borrowing Federal funds) have never been included in the base. However, FDIC implicitly insures them for large banks due to a policy to cover all deposits for all large banks that fail but not all deposits for small banks. This has been labeled the “too big to fail” policy and has been the subject of much debate. FDICIA did not change the assessment base but did provide for a retroactive assessment of foreign deposits in the event that foreign deposits are paid off in a bank failure.

The assessment rate for deposit insurance has also changed several times since its inception in 1933. It increased significantly, from 0.083 percent of domestic deposits on December 31, 1989 to 0.23 percent on July 1,
1991. This increase in the cost of funds can be passed to
depositors in the form of interest rate decreases or to
borrowers in the form of loan fees or higher interest rates.
In any case, it tends to decrease the supply of loan funds.

The introduction of risk-based insurance premiums
as of January 1, 1994 marks an important provision of
FDICIA. Premiums increase with the term of the loan.
Therefore, banks with longer-term portfolios have to pay
higher insurance premiums. This new premium structure
will discourage risk-taking, reducing the likelihood of
bank failure as a result.

FDICIA requires an on-site examination of each
insured bank once a year. In addition, banks with assets
of over $150 million must be audited by an independent
accounting firm. FDICIA also requires more data
reporting on bank loans to small businesses and farms.
This will increase the paperwork requirements of the loan
process, make lenders more conservative, and increase
the cost of funds for banks.

Finance companies, mutual and money market
funds, and other financial market firms are less regulated
than banks. As such, the cost of funds non-bank lenders
may be lower than banks which may explain their ability
to offer higher returns and lower interest rates. The
share of commercial debt held by banks has already been
overtaken by these other financial market participants
which may be a result of this shift in relative prices.
Whether or not this will be the case in agriculture re-
 mains to be seen.

The Federal Reserve Board has participated in
developing regulation aimed at reducing the likelihood of
bank failures. The composition of U.S. commercial banks’
portfolios has moved toward an increase in marketable
securities and a decrease in loans to business. Long-term
investments respond more sensitively to shifts in market
interest rates than short-term investments. Therefore,
this shift in portfolios may increase interest rate risk.

The Federal Reserve developed a system of weight-
ing assets and liabilities based on risk. Regulators can
predict the change in net worth that would occur from a
shift in market interest rates by subtracting risk-
weighted liabilities from risk-weighted assets. The
reserve requirements will be reassessed based on these risk measures. This is equivalent to a change in the definition of capital and will impact some lenders differently than others depending on the composition of their portfolios and their ability to raise funds.

The Farm Credit System has its own structure of oversight protection. The Western Farm Credit Bank, which is the source of credit to members in the western district, created an audit team that can check on the grading of credit and financial positions of each of its members. The FCS conducts an audit at least once a year. In addition, each association employs an on-staff auditor as required by the FCS. An independently audited financial statement is required annually.

Any financial institution holding property as collateral must file the securities in accordance with the Uniform Commercial Code (UCC). Under the UCC a security interest is a lien which a secured party has on the personal property of the borrower. A security agreement creates a security interest. Security agreements are filed with the Secretary of State. A mortgage creates a security interest on real property. These are filed with the county recorders office. Trade firms and others pass this cost on to the borrower.

**Lending Practices**

Lending standards changed across the industry as a result of the experience of the early 1980s and in response to regulation. While the general tenets of lending remain the same, the loan process has changed dramatically. Borrower repayment capacity has always been the basis of any loan, but the analysis used to determine repayment capacity and the amount of information required to carry out that analysis has changed. Consequently, the amount of paperwork has increased, making the loan process more arduous for both the lender and the borrower. Further exacerbating the problem, lenders can no longer fill out loan applications for their borrowers as a result of law suits that charged loan officers with being in partnership with borrowers and therefore, responsible parties in bankruptcies.

The current loan process is an expensive proposi-
tion. The initial interview is followed by the loan analysis. This requires a credit report, title searches on assets being used as collateral, appraisals, and searches for liens. The analysis must be written and verified; assets and the production site must be inspected; and legal documents (the note, the loan agreement, deeds of trust, and the borrower’s rights package) prepared. In addition, the production site must be inspected during the growing season (usually three times). Finally, copies of documents are provided when requested and a letter of maturity sent.

Real estate appraisals for land loans and collateral on other loans have become more sophisticated. Comparable sales no longer suffice for a complete appraisal. Income capacity is now a critical component. However, estimating the income capacity from real estate requires a knowledge of current production practices and market conditions, making appraisals much more complex than they were in recent past.

The borrower must provide financial records and a business plan projecting income and expenses. Farmers can easily provide tax statements. However, virtually all farmers pay their income taxes on a cash basis, allowing certain expenses to be prepaid and income to be delayed for tax management purposes. Cash flow, as stated for tax purposes, disguises the true profitability of the farm. Therefore, current lending practices require that income and expense information be provided on an accrual basis as well as on a cash basis. Farmers must include their accounts receivable and accounts payable in their income statements and net worth statements. Including accounts payable generally does not pose any problems; however, accounts receivable or income payments outstanding are often difficult to track.

In general, cooperatives, independent processors or brokers buy commodities and then act as a sales agent between the farmer and the retailer. Farmers rarely receive payments for commodities sold through these types of channels in full at the time of harvest. Instead, they receive partial payment at harvest and the remainder in installments over the next 12 to 18 months. The exact price cannot be determined until the entire crop is
sold to the final wholesaler. Selling commodities through cooperatives complicates the transaction more because the cooperative typically retains a certain amount of earnings and pays its members from a revolving fund over a period as long as five years. The lender, therefore, has to be knowledgeable about the marketing channels and assess not only the solvency of the borrower, but also the reliability of the marketing firms involved with the sale of farm products.

Payment capacity of the farm business is not the only consideration in making a loan. If off-farm income is stable and liquid, then there is a good chance that a loan can be made even if it will not cash flow easily on its own. High leverage is acceptable if the borrower has demonstrated a willingness to use off-farm income to support the farm business.

Lenders experience problems on production loans when a borrower claims that there is not enough money available to harvest the crop. At this point the lender has money invested in the crop and must either supply the additional money requested for the harvest or risk losing the invested cash if the only collateral is the crop. This risk can be minimized by requiring more collateral on the loan and/or by tighter control of disbursements. All of this increases costs to the lender.

Potential suits about lender liability represent a constant concern. Properties requiring contamination clean up, crops or animal products that are unsalable because of chemical contamination, and limitations placed on groundwater extraction illustrate the more complex and risky environment in which lenders operate. Lenders must often employ attorneys to check compliance with various regulatory requirements, such as the Acreage Reduction Program; the Conservation Reserve Program; the definitions of a farm entity for federal water (the 960-acre limitation); or program payments ($50,000 limitation). All of this adds to the cost of lending.

Lenders receive income from the interest paid on loans, loan application fees, and origination fees. Commercial banks charge points, while the FCS requires purchase of stock. Many of the transaction costs (and the time of preparation) are fixed costs which remain are the
same regardless of the size of the loan so, obviously, banks prefer to make large, well-secured loans of at least $500,000. (Many loans to California agribusiness are over $1 million.) The FCS and some state banks typically lend between $200,000 and $500,000. As a result, many lenders do not actively pursue small farmers or new entrants (Klonsky). Even though small farmers are generally good credit risks because they have other sources of income, small loans are more costly and less profitable for lenders. Market segmentation has resulted with lenders specializing in the general size of borrower they want to attract.

Lenders pass the costs of making loans on to the borrower in the form of a minimum loan origination fees or points system on real estate loans. For the Farm Credit System, the cost of funds remains the same for all of the associations, but the local management determines the loan fees. One association in California recently instituted a minimum loan fee on real estate loans so that they will not lose money on small loans. The association charges the borrower one percent of the loan or $2,500, whichever is greater.

Real Estate Values and Loans

Some lenders fear there may currently be a dangerous escalation in real estate prices. Despite the improved analysis of repayment capacity, improved appraisals and increased audits, real estate can still be leveraged beyond its productive level. For example, orchards in the Sacramento Valley cannot support more than $4,000 per acre worth of debt on an income basis, yet they sell for between $12,000 and $16,000. This means that two-thirds down is required for financing before the loan can cash flow.

Recent prices for orchard crops have been high, spurring renewed investment in orchards. Few growers willingly agree to sell, and this leads to the conversion of field crop land into orchards. This land is often marginally suitable for orchards. The recent drought fueled the situation by discouraging investment in high water-using crops such as alfalfa and rice. At the same time, most tree crops cannot survive in ground suitable for rice. Again, the recent drought contributed to the problem by
allowing trees to flourish that would have drowned under normal rainfall conditions.

In 1990, few institutions competed for land loans. The Federal Land Bank served as the primary lender. The creation of Farmer Mac loans brought insurance companies back into the market. Insurance companies and the small banks through which they may work do not face the same level of regulation as the FLB, and they can diversify their investments into many areas other than agriculture. If lending on real estate turns sour as it did in the 1980s, then insurance companies can cut their losses more easily than the FLB. This means the underwriting standards for the FLB may be stricter than for other real estate lenders.

The appraisal process has changed from using comparable sales to being solidly based on cash flow. Whereas, in the 1970s, loans were based on anticipated capital gains (which made some sense because of the rapid escalation in land values), the key to making high quality loans today is to firmly establish repayment capacity.

**Availability of Funds**

Improved loan analysis and the increase in regulatory efforts have effectively contributed to the drop in delinquent agricultural loans and have helped to make these loans attractive to lenders once again (Figure 8).

The situation in the general economy has not affected funds available to agriculture. Lenders assert that excess capacity exists among agricultural lenders and that availability of funds has not limited farm loans.

Indeed, the FCS raise funds at any time through bond sales. Alternatively, the FCS can raise stock level requirements to its borrowers and increase equity capital. Local associations can also “participate” with other associations in a loan if their funds are inadequate to make a particular loan. On January 1, 1994, regulators for the FCS changed the definition of capital. This changes the minimum capital requirements and may strain the system. Nonetheless, availability of funds will not cause problems for the FCS in the foreseeable future.

The FmHA has enjoyed an increase in funds from
the Clinton administration over previous levels. The FmHA focused on guaranteeing loans and moved away from making direct loans. Now they are actively pursuing lending in both areas.

**Figure 8. Percent of Loan Chargeoffs by California Commercial Banks by Sector (smoothed)**

![Graph showing percent of loans by sector]

Source: Federal Reserve Regional Bank Data

Yet, several problems related to the FmHA loan guarantee program make lenders unwilling to participate. First, escape clauses in the documentation limit the liability of the government. Second, many perceive a disparity in the expertise within the FmHA offices. Commercial banks use the guarantees to get around capital limitations, but that is not an issue for the FCS.

Future participation by the insurance industry is questionable. Financial difficulties and future regulatory changes may decrease the level of market activities (USDA, 1992).

While loans comprise the largest proportion of commercial banks' assets, they have decreased relative to securities. Further, agricultural loans have decreased as
a proportion of total loans. However, the volume of total loans, and agricultural loans in particular, has increased. Agricultural loans represent a small enough proportion of total assets that there does not appear to be a problem of available funds from commercial banks.

In summary, what borrowers consider to be a “credit crunch” in agriculture actually results from changes in the loan process and particularly, credit analysis rather than changes in the availability or cost of funds. Also, evidence suggests that these changes have been influenced by changes in the risk environment surrounding agricultural credit.

V. Current Criteria in Agricultural Loan Analysis

The profitability and riskiness associated with each of the 250 commodities produced in California vary across markets (Blank), thus agricultural loan analysis leads to differing results across products and locations. To provide insight as to how loan officers face this challenge, this section summarizes the findings of a study of current agricultural lending practices. Questions addressed include: do loan underwriting standards in the state vary by the commodity raised? by the location of the farm? by the size of the farm?

Lender Characteristics

The results reported come from the responses of 40 randomly selected lenders who were interviewed during the summer of 1993. The sample included personnel from 20 commercial banks, 13 Farm Credit System (FCS) institutions, three life insurance companies, two Farmers Home Administration (FmHA) offices, and two processors/marketers who lend to growers. Twenty-one of the 40 interviewees were loan officers, nine were branch managers, and ten were regional vice presidents.

For the entire sample, the size of an individual loan averaged $565,000. The average number of borrowers handled by an office or branch was 205. By lender category, the average loan sizes were: FCS $327,000; large commercial banks $1,095,000; small commercial banks
$371,000; life insurance companies $1,100,000; FmHA $138,750; and agricultural processors $387,500. By commodity, the largest loans were often made to dairies and vegetable farmers.

Table 6 provides a summary of basic information on the five types of lending institutions. The first two rows show the average high and low interest rates given by the institutions. The high rate of interest charged by all the lenders in the survey averaged 10.0 percent and the low rate averaged 6.5 percent. The prime rate, upon which nearly all the rates were based, was 6 percent during the survey, and has remained stable for the past year. FCS institutions tended to charge higher rates, while FmHA rates were lower. A detailed look at the distribution (Table 7) reveals that the highest rate charged by all FCS lenders is greater than average with just under half greater than one standard deviation above the mean. In contrast, the FmHA lenders rates were more than one standard deviation below the mean. However, FCS lenders had a large range of rates with close to 70 percent offering low-end rates below the average. Banks tended to have a somewhat narrower range of rates. While 75 percent of the banks had lower-than-average high rates,

| Table 6. Average Interest Rates, Losses and Portfolios of Lending Institutions |
|------------------------------------------|--------|--------|--------|--------|--------|
| Interest Rates:                         |       |       |       |       |       |
| High                                    | 10.0%  | 11.7%  | 9.3%  | 8.6%  | 7.3%  | 9.5%  |
| Low                                     | 6.5%   | 6.4%   | 6.7%  | 7.3%  | 5.4%  | 6.5%  |
| Losses:                                 | 2.65%  | 2.04%  | 1.31% | 5.67% | 12%   | 4.5%  |
| Loss                                    | 0.81%  | 0.54%  | 0.19% | 0.67% | 4%    | 2.5%  |
| Distribution of Loans by Term of Loan:  |       |       |       |       |       |       |
| Short term Percentage                   | 56.6%  | 35.5%  | 74.6% | 0%    | 55%   | 100%  |
| Intermediate Percentage                 | 5.8%   | 7.1%   | 5.7%  | 0%    | 12.5% | 0%    |
| Long term Percentage                    | 37.6%  | 57.4%  | 19.7% | 100%  | 22.5% | 0%    |
| Distribution of Loans by Commodity Group:|       |       |       |       |       |
| Field crops                             | 36.1%  | 28.6%  | 37.5% | 36%   | 37%   | 50%   |
| Grapes                                  | 14.2%  | 15.1%  | 16.4% | 21%   | 2%    | 4%    |
| Fruit                                   | 16.7%  | 13.7%  | 13.6% | 26%   | 15.5% | 50%   |
| Nuts                                    | 16%    | 12%    | 19.9% | 22.5% | 19.5% | 5%    |
| Livestock                               | 18.9%  | 14.9%  | 26.1% | 7%    | 11.5% | 10%   |
| Vegetables                              | 15.8%  | 18.3%  | 16.6% | 15%   | 3.5%  | 0%    |
| Other                                   | 6.8%   | 1.8%   | 0.2%  | 1%    | 1%    | 25%   |

1/ The percentages do not total 100 due to multiple commodity loans held by many borrowers.
2/ Numbers in parentheses are sample size.
Table 7. Distribution of Interest Rates

<table>
<thead>
<tr>
<th>High Rate</th>
<th>FCS (13)</th>
<th>Banks (20)</th>
<th>Insurance (3)</th>
<th>FmHA (2)</th>
<th>Business (2)</th>
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<td>r &gt; 11.65</td>
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<td>11.65 &gt; r &gt; 10.0</td>
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<td>25</td>
<td>0</td>
<td>0</td>
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<td>10.0 &gt; r &gt; 8.35</td>
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<td>50</td>
<td>100</td>
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<td>25</td>
<td>0</td>
<td>100</td>
<td>50</td>
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<th>FCS (13)</th>
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<th>Insurance (3)</th>
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<td>15</td>
<td>66.7</td>
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<td>0</td>
<td>0</td>
<td>50</td>
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<td>6.55 &gt; r &gt; 5.87</td>
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<td>45</td>
<td>33.3</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>r &lt; 5.87</td>
<td>7.7</td>
<td>20</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Only 65 percent offered lower-than-average low-end rates of interest.

Perhaps not surprisingly, FmHA lenders have the highest default and loss rates, as shown in Table 6. Insurance companies also have a high average default rate, but to a large extent this is due to differing definitions of default. Final losses (defined as the percent of loans which end in losses after final settlement) for insurance companies are generally lower than average. Banks have drastically improved their default and loss rates since the 1980s. Now, 90 percent of banks report less than the sample average default rate and 85 percent claim less than the average loss rate. The FCS has performed well with over 75 percent stating less than average default rates and over 60 percent showing less than average losses. Apparently, a few high rates in the sample heavily influence both these rates because 75 percent of the lending institutions reported below average default rates and 67.5 percent reported less than average losses.

Respondents were asked about their institution's portfolio, revealing important differences between lending types (Table 6). The average portfolio consists of 57 percent short-term loans, 6 percent intermediate and 38 percent long-term. Banks and the FmHA followed this pattern, but both are more heavily involved in short-term lending than the average. FCS lenders reversed the percentages, with 57 percent long, 7 percent intermediate and 36 percent short-term loans. This greater emphasis
on long-term loans may partially explain the higher interest rates these lenders charge. Insurance companies have lent exclusively for the long term while the others—processors and marketing organizations—were lending strictly for the short term.

Most lenders diversify their portfolios across different crops but several lend exclusively on one agricultural commodity, including one bank which specializes in dairy. On average, respondents' loans go to borrowers producing field crops (35 percent), with 14 percent of loans going to grape growers, 17 percent fruit, 16 percent nuts, 19 percent livestock, 17 percent vegetable, and less than 1 percent for other commodities such as nurseries or flowers (Table 6). The numbers do not sum to 100 percent since many borrowers produce more than one enterprise. The average portfolios of banks and the FCS tend to be fairly close to the overall average, though banks have a somewhat higher level of livestock loans and the FCS is somewhat lower in field crops. Insurance companies, which extend long-term loans, are much more focused on grapes, fruit, and nuts. They are much less likely to make loans in the livestock sector. FmHA lenders near average levels on most commodities with two notable exceptions: they show little lending activity in either grapes or vegetables. As the "lender of last resort," it may be that their borrowers are constrained from producing high value, but high risk commodities and are forced to focus on field crops, which form the largest share of the average FmHA portfolio.

The Loan Process

Lenders were asked to describe the loan process and the documents they require from a borrower. A summary of the responses follows. To begin, after the initial contact between lender and borrower, they complete the application and package. A field visit is usually scheduled, often conducted by a specially trained field person or appraiser. The loan officer completes his/her analysis and, in most institutions, can grant the loan if it is within his/her delegated authority. Most institutions utilize a loan committee to evaluate the largest loans. The average turnaround time for a short-term loan was reported to be
22 days after the borrower completes the package. For long-term loans, the average was 52 days because the appraisal can cause delays, and in most cases a commitment is made contingent on the appraisal. Most large banks and FCS institutions usually employ in-house appraisers while small banks usually hire fee appraisers.

Lenders require borrowers to provide three years of tax returns, a current income statement, a market value balance sheet, and a cash flow budget. However, real estate loans also require environmental questionnaires. In areas where water was a concern, a water questionnaire, a water plan, or well tests were often required.

Half of the lenders interviewed said that the loan process has changed recently. Some of the changes mentioned include greater use of computers, stricter verification of information, separation of the appraisal and loan analysis functions, and increased requests by lenders for accrual financial statements. Asked what proportion of their borrowers used cash accounting versus accrual accounting lenders responded that, surprisingly, an average of 21 percent used accrual accounting, although these were usually larger farmers such as dairymen or vegetable producers.

**Loan Analysis**

To identify the loan analysis criteria (i.e. underwriting standards) used in the field, lenders were asked if they used any of 11 financial ratios and if they had specific standards. The results indicate that no one ratio determines whether or not a loan is granted, the decision is based on a combination of several variables, some of which are subjective in nature. Table 8 lists the ratios and responses.

It is clear from the responses that lenders typically use just four financial ratios: debt-to-equity, loan-to-value, the current ratio, and the debt-coverage ratio (Table 8). The debt-coverage and current ratios address the question of repayment capacity. The loan-to-value ratio deals with strength of collateral. Debt-to-equity (a.k.a. the leverage ratio) shows the level of financial risk carried by the borrower. Over half of the lenders in the sample consider profit margin, which measures business performance. Only five respondents mentioned
Table 8. Financial Ratios and Standards Used by California Agricultural Lenders

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Percent Using</th>
<th>Most Common Standard Value</th>
<th>Response Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt-to-Asset</td>
<td>15</td>
<td>&lt;0.5:1</td>
<td>&lt;0.5:1 &lt;0.6:1</td>
</tr>
<tr>
<td>Debt-to-Equity</td>
<td>93</td>
<td>&lt;1:1</td>
<td>&lt;1:1 &lt;4:1</td>
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<tr>
<td>Loan-to-Value</td>
<td>88</td>
<td>&lt;65%</td>
<td>&lt;60% 100%</td>
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<tr>
<td>Current Ratio</td>
<td>93</td>
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<td>&gt;1.1:1 &gt;1.5:1</td>
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</tr>
<tr>
<td>Percent Return on Assets</td>
<td>35</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Percent Return on Equity</td>
<td>35</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Times Interest Earned</td>
<td>13</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Profit Margin</td>
<td>60</td>
<td>&gt;20%</td>
<td>&gt;15%  &gt;30%</td>
</tr>
<tr>
<td>Asset Turnover</td>
<td>18</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Debt Coverage Ratio</td>
<td>93</td>
<td>&gt;1.25:1</td>
<td>&gt;1.1:1 &gt;1.4:1</td>
</tr>
</tbody>
</table>

standards for profit margins. Two others pointed out that they had no absolute standards for profit margin, but they liked to see it on an upward trend. Other ratios, including debt-to-asset, intermediate ratio, percent return on assets and equity, rate interest earned, and asset turnover, although recommended by the Farm Financial Standards Task Force and found in agricultural finance textbooks, were not widely applied in loan analysis by the lenders interviewed.

The lenders were asked about both the debt-to-asset and debt-to-equity ratios to discover which of the two receives the widest use. Evidently, lenders use debt-to-equity more. Concerning the loan-to-value ratio, lenders often pointed out that it can be used for operating loans as well as term loans. They stated that even in operating loans, they expect the borrower to have some equity in his crop or livestock enterprises. A frequent observation about the current ratio was that its value can depend on the time of year in which it is measured, on the valuation given to growing crops, and, for dairies, on the extent to which the cow herd is considered a current or a non-current asset. The debt-coverage ratio was calculated by 60 percent of the lenders using a technique in which adjustments are made to a starting projection of net income. A common example is:

\[
\text{Debt-coverage ratio} = \frac{\text{net income} + \text{nonfarm income} + \text{depreciation} + \text{interest payments} + \text{capital lease payments} - \text{living expenses} - \text{income taxes}}{\text{principal payments} + \text{interest payments} + \text{capital lease payments}}
\]
However, the remaining 33 percent of lenders using the debt-coverage ratio use a cash flow spreadsheet approach, dividing projected net cash available for the year by the sum of debt service and capital lease payments.

The greatest sample-wide variation between standards occurred in the current ratio for which almost as many lenders used a standard of greater than 1:1 as used standards of greater than 1.25:1 or greater than 1.5:1. The least amount of variation in standards was observed for the debt coverage ratio. Sixty-six percent of those expressing a standard for the debt coverage ratio said that it should be greater than 1.25:1.

Only 20 percent of the lenders said that they used credit scoring in some of their loan analysis. Credit scoring was used in two situations: (1) real estate loans made and serviced by small banks and sold to life insurance companies for the Farmer Mac program, and (2) smaller agricultural nonreal estate loans. One lender said “we attempted credit scoring in the past, but it becomes so subjective; internal credit managers would like us to use it.”

The qualitative factors considered in loan analysis were reported to be management ability, character, reputation, credit history, risk factors, appearance of the farm, good records and financial data, asset quality, analysis of the industry, a farmer’s knowledge of his business, et al. Obviously, the factors on this list are not mutually exclusive. When asked to elaborate on what to look for when judging management ability, the lenders again mentioned the appearance of the farm and the borrower’s knowledge, the quality of financial data submitted, as well as production and financial history.

Farm Location and Size

The lenders were grouped into four geographic regions: the San Joaquin Valley, Sacramento Valley, coastal valleys, and Southern California. Underwriting standards for the commonly used ratios were compared between regions and no pattern of variability was observed. The central tendencies on ratio standards were the same for lenders in all four regions.

Lender’s Reaction to Risk

Seventy-five percent of the lenders said “yes” when asked whether the riskiness of the commodities produced
by the borrower alters the loan process. They reported that risk can make a difference in underwriting standards, especially the loan-to-value ratio. Also, riskier loans will be priced at higher interest rates. The main change in the loan due to risk involved a tightening of loan requirements, mentioned by almost 60 percent of the lenders (Table 9). Several lenders noted that higher risks meant more work for the borrower to prove knowledge or profitability of a commodity. This implies severe limitations on borrowers without a history of production in that commodity and could slow shifts from field crops to higher-value fruit and vegetable production statewide. Other changes in the loan process include higher interest or loan costs (17 percent of respondents) and a new loan approval process (14 percent). The latter may be of considerable importance to the FmHA.

Commodity risk was evaluated through industry analysis by 42 percent of the lenders and by tracking price and production history by 35 percent of the respondents. Quantifiable means of assessing risk include historical measures such as five-year yield averages or average profits. This was mentioned by 25 percent of the lenders surveyed. Industry trends, mentioned by 37.5 percent of respondents, are another quantifiable measure, but are less useful for assessing individual loans. Twenty-three percent of lenders mentioned borrower characteristics as a method of measuring risk. These are a combination of measurable factors (e.g. degree of crop diversification or percent of land owned), but many are more subjective (e.g.

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2 Differential loan rates are a common response nationally to varying degrees of risk between borrowers and/or commodities (Brunoehler).
reputation and general knowledge). However, nearly half the respondents listed no fixed system of risk assessment. Many rely on personal experience or use committees of loan officers from the region or state to develop guidelines. Responses were consistent across lender types, though banks rely relatively more heavily on borrower characteristics. This is possibly a reflection of relationships that develop over time between producers and, in particular, small local banks. Evaluation of risk was done in different institutions by different personnel: loan officers, field personnel, or centralized staff economists. Several respondents pointed out that the riskiness of some commodities is not only comprised of price and production risk. Political, economic, and environmental risk play a big role in the variability of returns for some products. For example, of California's Central Valley lenders mentioned, the water situation in parts is a major source of risk to farmers and lenders.

Each lender ranked the riskiness of the commodities produced by their borrowers. Vegetables, citrus, tomatoes, melons, strawberries, and grapes were most frequently ranked as the first or second riskiest types of enterprises. Dairy, beef cattle, field and row crops, almonds, and walnuts were ranked as the first or second least risky enterprises. However, the data is inconclusive because several commodities, such as cotton, citrus and almonds, were ranked as most and least risky crops by different lenders. Several respondents noted that it is difficult to consider risk by commodity since, as lenders, they are more familiar with analyzing the riskiness of a borrower's total operation which is often diversified.

Finally, when asked whether there has been a perceived a shift in risk within agriculture in recent years, the majority of respondents (62.2 percent) said that their assessment of relative risks had changed, and this was consistent across lender types. However, a major north-south difference exists across the regions in which the lenders were active. The results given in Table 10 show that a majority of northern California lenders have altered their risk assessment while a majority of southern California lenders have not. This arises primarily because of water issues. Southern California producers
Table 10. Changes in Relative Risk of Crops

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Northern California</th>
<th>N San Joaquin</th>
<th>S San Joaquin</th>
<th>Central Coast</th>
<th>Southern California</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of lenders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>37.8</td>
<td>0</td>
<td>27.3</td>
<td>71.4</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Yes</td>
<td>62.2</td>
<td>100</td>
<td>72.7</td>
<td>28.6</td>
<td>50</td>
<td>40</td>
</tr>
</tbody>
</table>

often lack affordable groundwater, but they are more assured of receiving contracted quantities of surface water than are Northern California growers. Consequently, questions to loan applicants as to water availability are common in Northern California.

In summary, interviews with California agricultural lenders point out that differences in the degree of risk associated with the income from production of a commodity highly influence the loan analysis process. The perceived riskiness of a commodity leads to stricter underwriting standards and to higher pricing on the loan, but nothing indicated that loan evaluation standards vary across regions of the state or by the size of the farm. Also, loan evaluation standards did not differ significantly between types of lenders. This is somewhat surprising considering the differences in the average loan amounts between lender groups such as large commercial banks and the FmHA. This indicates a strong degree of standardization in the loan analysis process.

Financial ratios are now standard in the analysis process. Financial ratios include the debt-to-equity, loan-to-value, current, and debt-coverage ratios. Although there is still considerable variation in the range of standards used in interpreting tools such as financial ratios still exists, it appears that agricultural loan analysis is becoming more sophisticated and focusing greater attention on risk.

VI. The Future of Agricultural Credit

Three questions are key in evaluating the future of agricultural credit: (1) Will any of the current suppliers of
credit leave agriculture?, (2) Which lenders will serve agriculture’s various sectors in the future?, and (3) What additional sources of credit will agriculture draw upon in the future? Each of these issues are addressed in the following sections, beginning with the first question.

The perceived increase in risk associated with agricultural production and marketing has forced many agricultural lenders to reassess their business strategies. This on-going reassessment process has significant economic implications for the entire agricultural sector of the California economy. In particular, questions raised include “is agribusiness becoming too risky for continued inclusion in the portfolios of commercial banks that have urban alternatives?” and “could risk be the ‘poison pill’ that scares off large commercial banks and insurance companies, leaving only small banks, FCS, and the FmHA to serve farmers?” If funds are diverted away from agriculture, interest rates in the sector could go up, thus adding to the profit squeeze which reduces the international competitiveness of U.S. farmers (Stanley and Barkema).

Agricultural lenders addressed these issues during their interviews (described earlier). In general, when asked the question “will risks eliminate loans to ag?” 30 percent said “no,” and 18 percent were uncertain. Lenders most commonly questioned the future role of commercial banks and large banks in particular (Table 11).

This section proposes an economic explanation for this somewhat surprising lender response in the face of risk, and explores some of its implications for lenders and the agricultural sector.

The Future Structure of California’s Lending Industry

To assess the future structure of the lending industry in California, lenders were asked to consider the situation they expect to exist in 10 years and to predict which lenders will serve agriculture’s various sectors at that time (Exhibit 1). Although virtually all respondents expect their institution to remain in agriculture and to play a significant role, they offered conflicting opinions about what competitors might do.

Respondents disagree as to whether or not the role
Table 11. Lenders Likely to Reduce Agriculture Loans

<table>
<thead>
<tr>
<th>Type of Lender Mentioned</th>
<th>by percent of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>None will leave</td>
<td>30</td>
</tr>
<tr>
<td>Uncertain</td>
<td>18</td>
</tr>
<tr>
<td>Large commercial banks, in general</td>
<td>20</td>
</tr>
<tr>
<td>Specific large banks</td>
<td>20</td>
</tr>
<tr>
<td>Small commercial banks, in general</td>
<td>15</td>
</tr>
<tr>
<td>Insurance companies</td>
<td>5</td>
</tr>
<tr>
<td>Production Credit Associations</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: the percentages do not total to 100 due to multiple answers given by some respondents.

of large commercial banks would increase, decrease or remain the same. Some felt that the role of large banks would increase for long-term loans and decrease for short-term loans, and others felt the opposite way.

Exhibit 1.

Summary Responses to: Which lenders will serve various ag sectors in 10 years?

Nine of the 40 respondents predicted no changes. The other answers follow:

Banks:
- Banks will not take on bigger ag. portfolios than they have now.
- Big banks don’t have ‘commitment to ag.’
- Commercial banks—dairies. Local banks—small to medium borrowers. Commercial banks will back off from smaller growers.
- Commercial banks for short and intermediate term; Commercial banks will stay away from long term.
- Down to three commercial banks.
- Farmer Mac is here to stay, allowing commercial banks to do real estate loans.
- For $1 million plus—the big banks; under $1 million—the small, independent banks.
- Foreign banks are in sometimes. Commercial banks will have to be proactive in ag.
- If Farmer Mac is successful and can keep portfolio quality,
then small regional banks will grow. Large banks may come back into the long-term business.

- In production ag., independents and FCS will lend to small borrower. Large commercial banks will lend to vertically-integrated companies.
- Independent banks will be primary source.
- Independents will grow. Major banks are not giving the service they should, losing old customers.
- Independents will remain in ag.
- Large banks have alienated borrowers (ag. lending takes expertise that large banks are unable to coordinate).
- Large banks will try to get back the smaller borrowers.
- Less independent banks due to mergers.
- Local independents will be around for special situations.
- Major banks will continue. Some independents will get out or merge.
- More community banks for short term, fewer large banks.

Farm Credit System:

- FCS—competing with both commercial banks and local banks.
- FCS—short term. FLB and insurance companies—long term.
- FCS may grow in next few years.
- FCS will be around (maybe there will be another 3 to 5 years of internal problems).
- FCS will be more aggressive.
- FCS will compete in both long-term and short-term markets.
- Federal Land Banks and insurance companies for long term.
- FLB will be in long term. PCA will always be there.
- FLB with long term. PCA and independents for short term.
- In production ag., independents and FCS will lend to small borrower.
- Maybe a merging of FCS and FmHA.
- They hope that FCS comes back.

Life Insurance Companies:

- Five million dollars plus for life insurance companies, but most will go with the Farmer Mac program and some direct.
- Federal Land Banks and insurance companies for long term.
- Insurance companies—big, long-term loans.
(Exhibit 1 continued)

- Insurance companies are off and on, but will continue.
- Insurance companies are starting to make rumblings about getting back in.
- Insurance companies remain in long-term lending.
- Insurance companies seem to be more lenient.
- Life insurance companies are currently out of money.
- Life insurance companies for big deals and real estate loans.

Farmers Home Administration:

- FmHA will be here but respondent isn’t sure if it will be guaranteed or direct.
- If FmHA reduces its paperwork, then it will be around.
- Maybe a merging of FCS and FmHA.
- With cuts in FmHA, respondent wonders if it will be around.

The comments about local banks generally agreed upon an unchanged or increased volume. Several mentioned that Farmer Mac will allow local banks to make real estate loans. Others mentioned fewer local banks will be around as a result of mergers.

All comments about life insurance companies indicated that they are expected to stay in for real estate loans. A few mentioned they would be moving to only large real estate loans, and others noted the in-and-out nature of participation.

All respondents mentioning the FCS felt it would remain important in both short-term and long-term markets. Several felt it would expand.

Only a few respondents mentioned the FmHA, particularly regarding the uncertainty of FMHA’s future. One person questioned whether the loans would be guaranteed or direct.

Two respondents mentioned processor credit. This means that the supply of credit could vary between specific market segments and for long-term and short-term loans. Lenders will continue to make funds available to California’s agriculture based on profitability relative to alternative investments.

Future Sources of Credit

The third question concerning the future of agricul-
tural credit in California is whether other potential sources of additional funds exists. During interviews, 95 percent of the lenders expect some new sources of credit to become more significant in the future. The sources mentioned are listed in Table 12.

The funding sources listed in Table 12 can be categorized as two types: internal (within agriculture) and external. Obviously, most lenders expect internal sources to be the most likely area of expansion for agricultural credit. Both product handlers, such as processors, and input suppliers have a strong interest in supporting agricultural production so as to maintain their own businesses. Thus, it is reasonable to expect these sources to expand to some extent. However, product handlers and input suppliers have historically offered a narrow range of financial services, and no one should expect them to diversify their credit services further. This means that internal sources of credit cannot be expected to become more numerous, only more readily available when needed to maintain their own businesses.

External sources of funds are not expected to expand widely, with the exception of “Farmer Mac.” As shown in Table 12, over half of the lenders interviewed expect that the Farmer Mac will succeed in becoming a significant source of funds for agriculture. By securitizing loans on agricultural land and residential property, Farmer Mac enables anyone to invest in agriculture.

<table>
<thead>
<tr>
<th>Type of Source Mentioned</th>
<th>by percent of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor credit</td>
<td>68</td>
</tr>
<tr>
<td>Farmer Mac</td>
<td>55</td>
</tr>
<tr>
<td>Trade (supplier) credit</td>
<td>53</td>
</tr>
<tr>
<td>Hard money, private lenders</td>
<td>10</td>
</tr>
<tr>
<td>Leasing</td>
<td>8</td>
</tr>
<tr>
<td>Brokers</td>
<td>3</td>
</tr>
<tr>
<td>Doane Western</td>
<td>3</td>
</tr>
<tr>
<td>A consortium creating a pool of funds</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: the percentages do not total to 100 due to multiple answers given by some respondents
Unfortunately, Farmer Mac does not provide funds directly for agricultural production, although it may indirectly enable lenders to expand their production loan portfolios. Several California lenders actively participate in Farmer Mac because, in the case of some small commercial banks, it enables them to expand the size of their total loan portfolio and to serve a market segment (agricultural real estate) that they previously could not serve. The legal limit on loan size reduces this tool’s potential use by large lenders.

The Future, in Summary

The future supply of agricultural credit in California mirrors the present, based on the results of the interviews with lenders. To begin, lenders generally believe that few, if any, institutions will leave agriculture in the next decade.

Most lenders expect additional sources of credit to be available to agriculture in the future—in particular, from processors, input suppliers, and Farmer Mac. Farmer Mac offers another source of funds for borrowers seeking relatively small real estate loans, but its size limitations reduce its potential contribution in California where land values are much higher than those in the Midwest (which was the primary target of the Farmer Mac program).

All respondents said that competition between lenders has changed in recent years, but they disagreed on the nature of the change—some saying the industry has become less competitive while others think direct competition has increased. It may be that the consolidation which has occurred in the lending industry recently is still in progress, thus making the final outcome difficult to anticipate. The belief expressed by virtually all respondents is that their institution has no plans at present to leave agriculture. Also, agriculture will continue to attract and lose lenders based upon the profitability relative to alternative sources of demand for credit both in and outside agriculture.
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U.S. Department of Agriculture. Economic Indicators of the Farm Sector: State Financial Summary, various issues.
Panel #2 Response

James Cirona
Western Farm Credit Bank

I want to talk about one aspect of credit that usually doesn't get too much attention, but I think will have profound, long-term effects on both the availability and cost of credit for agriculture. Enough has been said about the problems of the 1980s; but also at that time finance ministers from countries heavily involved in international trade came to understand that there had to be a better mechanism for measuring both credit quality and the strength of financial institutions in various countries in order to facilitate world trade.

They met in Basel, Switzerland, and over the course of several years, developed what we now know as risk-based capital standards. This concept is relatively new in banking, being instituted at the end of the decade of the 80s, and now working its way through the system.

Essentially, they agreed at the Basel conference on how to weigh the risk embedded in different types of credits. For example, if a bank invested in the credits of its own government, generally speaking, those were zero risk to the institution. If the capital requirement for a bank was, say, 5%, and a bank chose to invest all of its assets in government paper, 5% of zero would still be zero, and theoretically, the bank would need no capital to support the risk in those assets. If a bank chose to invest in government agency paper, such as the Farm Credit System or the Federal Home Loan Bank paper, it would have a risk rating of 20. If you multiply that by the five percent standard, that meant $100 million in assets invested in government agency paper would need, $1 million worth of capital. One-to-four-family residential loans have a risk weighting of 50, so the capital requirement would be $2.5 million.

Agricultural loans have, at a minimum, a risk weighting of 100. Investing $100 million in agricultural loans means that the bank needs $5 million worth of capital to support those loans. The fact that banks need to build
capital and need to change their risk profile by improving asset quality suggests why some banks are reducing the supply of credit available for agriculture. This varies from lender to lender and from country to country. I think it’s safe to say that if banks want to grow and capital is limited, the attractiveness of agricultural lending will be less than it might have been before the risk-based capital standards were adopted.

There’s been talk about European commercial banks coming to this country to make loans. I think we’ll see some of that, simply because they’re looking for geographic dispersion. This is a new market for them. It’s more instructive to look at the history of the Japanese banks which came here in the 1980s. They were very active and they could invest both in equities and real estate. For the Japanese stock market and the Japanese real estate market, the 80s were boom times. And as those investments appreciated in value, the increase was added to their capital accounts, which meant lots of lending capacity. Well, the reverse is happening now in Japan. Prices are going down in real estate markets and in their equity markets, which means that their capital base is narrowing and the Japanese banks are pulling back from lending in this country.

The bottom line is—capital is king. Asset quality is important because that’s the determinant of the capital requirement. Agricultural lending for regulated lenders will not be as attractive in coming years as it has been in past years. Credit quality will be most important. If you’re in production agriculture, one of the things you need to do to improve your credit is to have very good financial records and financial planning.

I think it’s also imperative that those of us who are lenders to agriculture, and are limited to lending in agriculture, to be good stewards of this system. We, too, are subject to these same risk-based credit quality standards. We must keep our house in order so we can be there when pressures in the commercial banking system might lessen their ability to be lenders to agriculture. In- and-out lending will be more apparent with larger commercial banks that have many other kinds of lending opportunities available to them than with community
banks, which are more or less restricted to the markets they know.

The advent of risk-based deposit insurance premiums has been mentioned. Once those get phased in, in 1995, there will be added pressure on the commercial banking system because of its reliance on deposit insurance. When you add the factor of risk-based deposit insurance to risk-based capital standards it means that the availability of credit coming from those sources may have limitations that we weren’t accustomed to in the past.

We have unregulated lenders; the insurance business is trying to stave off federal regulation by going to self-imposed credit standards. It’s too early to tell whether or not that will succeed, but they’re certainly trying hard. Keep in mind that with the risk-based capital standards that we all now face, agriculture has to do a better job of making its case in the banking system, so that they can continue to have good credit availability at good prices.

Charles M. Lewis
Farmer Mac Consultant

I want to talk briefly about our Farmer Mac experience at Feather River State Bank. In the summer, 40 percent of our loan portfolio is in agriculture. That came about after we had been participating in the Farmer Mac program. Prior to that, we ran about 12 to 15 percent. We got involved in Farmer Mac, great changes began to take place.

First, we were invited to be the guinea pig. We originated the first loan in the United States in 1989 under the Farmer Mac standards. We worked with Prudential Ag., and we liked it so well that we really caught fire. Now, our Farmer Mac servicing portfolio has become a very important profit center for our bank. The profit to the bank comes in the form of origination fees and servicing fees.

But even more important have been the marketing aspects. Farmer Mac has been the primary growth engine that we have had in our bank. It enables us to contact more customers in the agricultural arena—both farmers and agribusiness people. It has enabled us to develop
more deposits, to develop more crop loans, livestock loans, and machinery loans. All in all, it has been a tremendous enhancement. It enables us, as a small, independent bank, to deal with a number of borrowers that we couldn’t otherwise handle. It enables us to create the asset, sell the asset in to the secondary market, and then, reuse those funds for other purposes and for additional lending.

Being involved in the Farmer Mac program also has instilled in us a new appreciation for more rigorous underwriting standards. We heard this morning about the Farm Financial Standards Task Force and their guidelines. Many of those guidelines are quite similar to those that are included in the Farmer Mac Security Guide. So as we got involved in Farmer Mac, we’ve applied more and more of those guidelines to our other lending activities.

Phillip Peters
John Hancock Mutual Life Insurance Company

I’d like to give you a current run down on the investment environment for insurance companies. As everyone knows, during the last five years the financial industry has gone through tremendous change and the insurance industry is no different.

Issues of insolvency and liquidity have been raised by the notoriety of such institutions as Mutual Benefit Life. We’ve experienced the depressed real estate market and lingering economic problems of the recession—and all of this has been apparent in our investment portfolios. We’ve seen a series of credit rating downgrades by the various credit rating agencies. All of these events have impacted investment policies of insurance companies.

Following all of this was the imposition in 1992 of risk-based capital standards for insurance companies. We, too, are regulated, and it has had quite an impact. Risk-based capital standards set reserve requirements based on asset class and risk factors associated with each class.

Obviously, the risk-based capital standards have an immediate impact, but the long-term implications on policy investments are significant, and the insurance company has reacted in several ways.
First, and probably foremost, is in investment standards. We’ve become very focused on quality. We adhere strictly to very sound underwriting standards. The placement of funds is predominately in the area of investment-grade quality assets. I think that’s very significant.

Of course, we’ve gone through our own downsizing—doing more with fewer people. That’s a common event these days. We have seen minimum loan sizes, particularly in the agricultural side, increase dramatically. Anyone who’s been working with investment staffs of insurance companies realizes the impact of these downsizing events. All of this has focused insurance lenders on a very disciplined course. The quality issue is pervasive and really driving the investment decision process.

Speaking from a very specialized perspective in lending to agriculture, I can tell you it’s very competitive. It’s competitive not as a result of the external forces; actually, the competition is internal. We’re having to show good performance measures and some very good risk attributes in the investments that we look at. It’s difficult competing for resources within the insurance companies these days—and that’s going to continue.

It’s not unusual for us to look at, say, ten very good investment prospects and complete only one. To arrive at the ten that meet our current credit needs, we probably have to look at in excess of 25. Some transactions that were made in 1989 and 1990 certainly wouldn’t be completed today.

Where does agriculture fall into this decision process? Clearly, agriculture is only a small component of the investment portfolio for insurance companies, but it’s always been a very important part for diversification purposes. The industry is very important in the economy and agriculture clearly has been a long-term, reliable asset category for investment decisions. This was made clear when they were establishing risk-based capital standards for insurance companies on agricultural mortgages in 1992. Insurance companies active in agriculture banded together, presented a very strong argument to the National Association of Insurance Commissioners, and came away with a reasonable set of reserves for agricultu-
tural mortgages.

This has allowed insurance companies to continue to be competitive in the agricultural market. I think you can come away with some confidence that insurance companies are committed to agriculture, but you must recognize that the commitments vary with the degree of business climate and will certainly change through cycles. There are many attractive investments for insurance companies in many different industries. The driving factor is going to be the risk-return relationship. We'll never get away from that.

We can't expect legal costs, or the environmental risk, assessment and compliance work, or the financial reporting standards to be any less expensive—or important—to insurance lenders in the future. I think in many instances those costs will increase. These are very important issues to insurers fulfilling their fiduciary responsibility. What I would stress most to many borrowers in terms of improving their opportunities to obtain credit is to improve financial reporting.

I have two conclusions in regard to insurance lenders. Rates of return commensurate with risk will always drive the investment decision, and the financial industry will continue to change quickly. We all have to be flexible. That's the motto that we live by, and we expect change to continue.

Terry Scranton
Bank of America

Let me editorialize a bit about the study from my perspective as a commercial banker. Clearly, the dramatic shift in commodity prices and in agricultural real estate values from the 1970s to the 1980s had a major impact on the operations of both borrowers and lenders. The study notes that the adjustment in lending, however, was more drastic than the degree of change that prompted it. That may be so, depending on your perspective, but drastic is certainly relative considering that agricultural banks and the Farm Credit System were bleeding profusely at the time. So it depends on which side you happen to be on.
The study did not discuss the significance of the speculation that agricultural economic growth would continue indefinitely. In fact, we know that it just didn’t continue as it had during those boom years. Neither the lenders nor the borrowers anticipated the changes in the economic trends that had previously fueled expansion of the ag economy.

Farmers and bankers are alike in the sense that they have to generate returns for owners despite economic uncertainties that create changing risk scenarios. We all have to make risk decisions, investment decisions, so there really is no difference. We have to make the right decision.

As a result of the lessons that we did learn, ag producers have become much more sophisticated. That is the good news as we go through the 1990s. The lenders have returned to financing agricultural enterprises more like other business entities—only cash pays back loans. Cash flow, cash flow, cash flow.

From the commercial bank perspective, I agree with the report that there is no credit crunch for agriculture or for any other industry. Because of the economy—other sectors as well as agriculture are not borrowing money. Need is a critical factor as you go to borrow money. If there is no need, there is no demand for credit.

While “credit crunch” is a very provocative term, in reality an industry’s financial strength and profitability potential should always determine its borrowing capacity—a lesson we hope never to forget again.

As the study concludes, there was a major recession in agriculture during the 80s, and both lenders and borrowers adjusted—just as they will continue to adjust to the challenges of the 90s.

The agricultural industry and its lenders have been very ingenious and effective at mitigating risks. They have intensified their planning efforts, further diversified their investments, and most importantly, the ag industry has reduced its borrowing, thus improving its net worth. The peak national agricultural debt in this country reached $212 billion. It now is around $145 billion. Farmers are less leveraged, but there was a lot of pain getting to that point.
The study correctly identified the impact of regulatory changes. Many of these requirements have proven to be prudent, as evidenced by the decrease in ag loan problems with most lenders. We all share a common interest—with a healthy agricultural lender, we will be able to sustain competitive credit markets. However, it has been difficult for many borrowers to adjust to the expanded requirements—whether it is a 50-page legal document or loan agreement or more financial information.

The study also pointed out greater differentiation in lenders’ treatment of different-sized borrowers. I would hope that we do not treat borrowers of different sizes differently, but the facts are that you have different sources, as well as different lenders seeking out different markets. Agriculture in California, as Dr. Farrell said, is big business. But it is small business, too. In our bank, nearly one-third of the total number of loans are under $500,000.

The diversity of the finance industry has provided ag borrowers with a very competitive credit market, and as you can see from the study, the prediction is that will continue to be so.

The majority of the farmers in the west are well-positioned relative to other businesses to cope with economic and environmental challenges. In response to the financial crisis in agriculture in the 1980s, most operators have reduced their debt to better deal with increasing risk associated with agriculture. The trend in agriculture to reduce debt continues, as borne out by the study.

Although debt burdens may increase for some individual farm borrowers, the aggregate debt level is expected to continue declining as the industry braces itself for the next round of economic uncertainty. The risks confronting agricultural producers and agribusinesses are not expected to change during the rest of the 90s. Such trends include a greater reliance on export markets, the competition from the foreign producers, the rising cost and decreasing reliability of some water systems in the western states, the continuing consolidation of the industry, and de-stabilizing governmental farm and environmental policies.
Successful farm operators have had to manage and plan for such risks. They have diversified by growing different commodities and investing in other agribusinesses. Often producers have vertically integrated their operations, attempting to create more reliable profit margins by adding value to the raw commodities they produce. You are concerned about profit margins just as the bank is concerned about profit margins.

In addition, better financial information will continue to be essential to farmers and ranchers in the 90s. This has been repeated many times today. Even if you happen to be one of the last kicking and screaming through the door, it is just not going to go away. When there’s extreme competition—as there is today among commercial banks, insurance companies, and the Farm Credit System—sometimes exceptions are made, but the trend is that financial information will get better. That kind of working together bodes well for the decision that will be made and, hopefully, it will not take 60 days to make it.
Public Policy and the Recent Agricultural Credit Environment

Daniel A. Sumner

I. Introduction

Two questions are explored in this chapter. First, what has been the role of public policy in the current farm credit situation? The second question follows from the first but is forward looking. What are the implications of alternative adjustments to policy for the evolving agricultural credit situation and outlook? Unfortunately, but not surprisingly, this paper cannot answer either question in full detail. However, a discussion of these questions has been designed to help shed some light on the role of public policy in farm credit markets and to encourage a broader discourse on policy topics. Neither policy recommendations nor definitive conclusions are presented.

There have been some recently observed trends that indicate what is referred to above as an evolving agricultural credit situation and outlook. However, there seems to be nothing in current events or on the horizon

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that one would naturally characterize as a “new environment,” except perhaps in the trite sense that even a day just like yesterday is a new day. The “new risk environment” may indeed be very much like the “old” risk environment. With this said, it seems true that in recent years lenders have applied somewhat more rigorous standards, asked for improved documentation from borrowers and placed more emphasis on the income potential of investments to be financed. Further, agricultural conditions in California evolve at a rapid pace, implying that added concerns face farm borrowers and lenders.

We are just a few years past the farm financial crisis years of the middle 1980s which led to the reform of farm credit institutions. Further, banking and credit market regulations were revised more recently, and farm and environmental policies have been changing steadily for a decade. It is, therefore, clearly of interest to systematically review the role of public policy in the current agricultural credit situation.

Anyone beginning an investigation of the connections among policy, agriculture, and credit is struck by the fact that credit is basic to the business of agriculture. Anything that relates to agriculture relates to the supply of or demand for credit. And, of course, public policy pervades agriculture. It is well known and often expressed that any farm or resource policy provision (from pesticide regulations to cotton subsidies) has credit market implications. In Congressional policy debates, credit market implications are often considered central to arguments for or against some farm policy. For example, the reaction of banks or bankers are sometimes invoked to ward off suggestions for reduced farm subsidies. Aside from the effects of farm or resource policies on credit markets, money and banking policies and specific policies regulating and subsidizing agricultural credit institutions influence agriculture. A discussion of policy and farm credit markets must deal selectively with financial and credit policies in general, with farm credit policy and with broader environmental and agricultural policy issues.
II. Macroeconomic Policy and Credit Market Regulations

We must remind ourselves that agricultural credit markets are a part of the broader financial markets. This is particularly true in California, where the banks lending to agriculture are larger than in other states and institutions specific to agriculture play a smaller role in farm finance. We should expect, therefore, fiscal and monetary policies to influence California agricultural credit markets in much the same way they influence other financial markets.

Fiscal Policy

The fiscal policy issue of note in recent years has been the continuing federal budget deficit. In the late 1980s economists speculated that the growing deficit caused higher real interest rates. Even then the evidence for a crowding out of private borrowing was difficult to document; the intervening few years of growing deficits and falling interest rates make such an effect even less plausible. And, whereas there is a lot of room for speculation about the effects of the federal budget deficit on agriculture and the economy, such effects do not seem to be a driving factor related to farm finance in California. (For more on agriculture and the deficit, see Schaub and Sumner; Eisner; and Meltzer.)

Monetary Policy

Money supply has followed a steady non-inflationary course for a decade or more. After falling rapidly in the early 1980s rates of inflation in all major aggregates have been low and steady. Economists generally consider such a monetary policy appropriate for well-functioning financial markets, and little on the horizon suggests major changes. Ten years ago one could not have been so sanguine about the course of monetary policy. After the inflation in the 1970s, the monetary-policy induced disinflation and recession of the early 1980s substantially affected agricultural asset values and credit market events. The farm credit crisis of the 1980s was, in part, a consequence of restrictive monetary policy used to drive
inflation and inflation expectations out of the economy. Since that time monetary policy seems to have had more of a steadying influence. While macroeconomic policy always has the potential for significant influence on credit markets, at present, neither monetary policy nor fiscal policy are major current issues for farm financial markets—a statement that could not have been made a decade ago.

Credit market regulations

There have been several recent changes in credit market policy that should be considered for their implications on agricultural credit markets. These changes derive from legislation, regulation, and regulatory behavior. They affect all banking and financial markets but may affect markets and institutions differently. We include only a brief mention of these changes here, not because they are unimportant, but more specifically, because agricultural issues deserve more detailed treatment. (See USDA, ERS Ag. Income and Finance Situation Reports for 1992 and 1993.)

The Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) in 1989 and the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991 modified credit market regulations. The Savings and Loan fiasco stimulated the creation of these laws, which tightened regulations on banks. They did not complete the process of deregulation or regulatory reform, but rather tightened the regulations to reduce the potential for major financial losses. FDICIA added borrowing ability for the deposit insurance fund and modified characteristics of bank assessments to finance the deposit insurance system. FDICIA also increased the level of oversight by bank regulators. A long list of new reporting requirements and regulations were designed to reduce the chance that banks would become vulnerable without the knowledge of regulators. This should reduce the potential losses of the deposit insurance fund. However, these new regulations have compliance costs and make the process of lending money more cumbersome, formal, and rigid. Some of the new regulations may favor small banks over large banks, and in many parts of the
U.S., that means agricultural banks may be advantaged. Of course, in California both large and small banks are heavily involved in farm lending and no such effect applies.

Perhaps the less formal and undocumented changes in the regulatory environment have been more important than the changes in legislation or explicit regulation in recent years. Bank regulators have added pressure to assure their superiors that the banks under their supervision are making sound loans and are not exposing depositors or taxpayers to undue risk. No concrete analysis of this tightening exists; however, conversations and impressions leave little doubt that lenders must provide more documentation to show that loans are sound and to rely less on their knowledge of the borrower and other informal measures.

The potential exists for a more thorough deregulation of the financial sector, allowing banks to compete in more markets with fewer restrictions in the future. Since commercial bank lending to agriculture is of major importance in California, policies allowing banks to lower their lending costs are likely in the interest of farm borrowers.

A second issue for the future is a more careful assessment of regulations which impose formal or informal restrictions on lending practices. Borrowers as well as lenders know that regulations can add to the costs of lending, regardless of the loan size. This discourages lenders from making smaller loans because the anticipated profits from a small loan are less likely to cover the fixed regulatory costs involved in initiating and servicing the loan. Given federal deposit insurance and the importance of confidence in the financial services industry for the economy as a whole, there are strong arguments for the regulation of banking practices. However, the burden of the indirect costs of vigorous regulation and preemptive enforcement have become more evident in recent years. Policy participants must ask if the pendulum of regulatory oversight has swung too far, and if so, what modifications are appropriate and feasible.
III. Agricultural Credit Policy

The Commodity Credit Corporation (CCC) price support loans, the Farmers Home Administration (FmHA), and some smaller lending programs provide direct lending from the government to farmers. Government-backed loans are available from the various institutions of the Farm Credit System and, increasingly, FmHA. These major lending programs changed significantly through legislation in the late 1980s and in the 1990 Farm Bill. Further, after large federal budget costs in the 1980s, these programs have been administered in recent years to attempt to limit federal budget exposure to the extent feasible under the law. Farmer Mac is the new institution in the federal array, but its role is only now being observed, and its impacts are, so far, small (see Klonsky et al.).

Commodity Credit Corporation

The CCC crop loan programs have become much less a feature in short-term farm credit than in earlier years because program crop loan rates are now typically below market prices for grains and oilseeds. That means it is unlikely that producers will make use of the loan features of the program. Further, for rice and cotton, the marketing loan provisions converted the price support loan to a direct income payment program in 1985. So, whereas the income support characteristics of the program expanded, the credit use of the program has been reduced. On a national basis, the level of CCC lending dropped from a level of $17 billion in 1986 to $4 billion last year. Finally, compared to other regions, these programs carry less importance in California because cotton, oilseeds, and grain crops—the only crops for which CCC price support loans are available—account for less than 10 percent of agricultural output (Figure 1).

Memory of the surpluses created by a policy of high loan rates in the early 1980s suggests that it is unlikely that federal policy will return to such a pattern anytime in the near future. The current policy climate provides more support to the idea of higher loan rates, but enough residual recognition of the problems of trying to
set farm prices in Washington remains, indicating that loan rates will stay below domestic market prices for program crops in most years. For cotton and rice, which account for the bulk of program crop revenue in California, the marketing loan program is not often used as a farm finance tool but as an income support for farmers and a marketing tool for cooperatives and others. That seems to be the likely course for the future. The importance of the commodity programs as income supports will be discussed below.

**Farmers Home Administration**

The Farmers Home Administration (FmHA) is an agency within the USDA which provides direct lending to farm borrowers who have difficulty acquiring credit from other sources. After expanding in the late 1970s, FmHA got into financial difficulties in the 1980s and has been shrinking since. Nationally, FmHA went from nonreal estate debt of about $15 billion in 1985 to about $7 billion in 1992. FmHA real estate debt declined over the same period from about $10 billion to about $7.5 billion. The FmHA share of all farm debt fell from a high of more than 16 percent to 12 percent—still far above the five percent it held until the late 1970s. The market share for FmHA in
California is below the national figure but still significant. (See Figures 1 and 2 in Klonsky et. al.)

The most telling statistics about FmHA, however, are those relating to problem loans and default rates. The share of FmHA direct loans classified as delinquent has fallen between 40 and 50 percent for a decade—compared to 3 to 5 percent for other institutions. In addition, FmHA has written off about ten percent of its loan value each year for the past five years. These measures of problem loans vary by region of the country, and California fares better than many other states.

Among the categories of loans, those associated with economic emergencies and disasters have the highest rates of delinquencies. In 1992, farm ownership debt had a delinquency rate of about seven percent, and farm operating debt had a delinquency rate of about 24 percent. Economic disaster loans had a delinquency rate of 60 percent! In many cases the FmHA loans have simply been treated as grants. (See USDA, ERS, February 1993.)

FmHA reform has been gradual with considerable resistance on the part of members of Congress who represent delinquent borrowers. Recent changes include somewhat more stringent standards and more ability to close on bad loans. In addition, the 1990 Food, Agriculture, Conservation, and Trade Act mandated a move away from direct lending and toward government-guaranteed loans from commercial lenders. The share of guaranteed loans of the total obligations by the agency have risen from less than 20 percent in 1985 to about 70 percent currently.

These new guaranteed loans have exhibited fewer problems than the previous direct loan programs. The working down of problem loans will continue for a while longer as legal restrictions and political pressure limit what the agency can do. As noted by Federal Reserve economists, John Rosine and Nicholas Walraven, “The delinquent loans at the FmHA are the last holdover from the farm financial problems of the 1980s.”

The fundamental policy question with respect to FmHA, however, remains—can an agency of the USDA run a lending operation using sound financial practices
given the political environment in which it operates? In addition, one must ask if it is in the interest of borrowers or agriculture as a whole to encourage investments by borrowers who are not likely to be in a position to make a profit of the farm operation being financed. The 1995 Farm Bill will consider these and related questions.

**The Farm Credit System**

The various institutions that make up the Farm Credit System (FCS) have relatively loose ties to the federal government, but the federal government underwrites their bonds and helps them acquire funding at low rates. The FCS also went through major problems in the 1980s and emerged after substantial losses a smaller and much reformed organization. The FCS continues to be a major supplier of credit to California agriculture, and the system seems much less vulnerable to losses than a decade ago. Thus, immediate public policy concerns are muted.

However, analysts 20 years ago would have considered it incredible if someone would have forecast large losses for the FCS in the 1980s, so confidence should not be overemphasized. The system continues to have agency status which provides benefits such as state and local tax exemptions on interest. It is useful in this context to regularly raise and discuss the basic policy question about the FCS—why is there any public backing for these institutions? Why does the taxpayer want to place funds at risk to provide backing? If the various banks are competitive and effective institutions, what public purpose is served by a relationship to the federal government no matter how limited? Indeed, since federal backing always comes with rules and regulations, perhaps these institutions would be stronger and more effective without any federal role other than that which is also applied to banks and credit unions.

**Farmer Mac**

The idea of Farmer Mac is to facilitate a secondary market to allow financial institutions lending directly in agriculture to sell those instruments in a broader market to those who lack the expertise or interest to lend
in agriculture directly—an idea that may now finally be gaining acceptance. However, again the basic question remains—if there is a real market demand for these services, why does it need federal backing?

Agricultural credit policy in the United States has been an odd composite of subsidized lending with a policy tone exemplified by Poor Richard, in his stricture, “neither a lender nor a borrower be.” Even though the basic farm credit policy instruments attempt to make credit available to more farmers at lower rates, the reduction of farm debt in the latter 1980s was looked upon with pride by policy makers. So much so that they questioned what was wrong when the downward trends in farm debt slowed, and debt increased in the early 1990s. There sometimes seems to be little recognition in public policy circles that more debt can be the sign of a healthy agriculture.

IV. Environmental Policy and Farm Finance

It is itself a statement about the state of government policy that a decade ago that a paper on government policy and agricultural credit would not have included a section on environmental policy. Today one can say little about agriculture without discussing environmental policy. As with other issues affecting the supply and demand for credit, environmental policy affects both the expected level of farm income and potential for substantial income or wealth loss. The paper by Hyde et al. discusses some of these issues in the context of risk of income losses for California agriculture. In this section we highlight several example policy issues to indicate the importance of policy choices.

Endangered species

The Endangered Species Act (ESA) has had a growing impact on California agriculture. The headline cases include the Winter Run Chinook Salmon and the Delta Smelt. Many other potentially important cases exist; however, no estimates are currently available of the net effect of endangered or other listed species on farm
sales value, net income, or asset values. It is my guess that, in aggregate, the measurable impacts to date are relatively small in relation to the size of California agriculture. Even with the listing of species and the initiation of policies to aid in species recovery, relatively little land has been removed from production on a statewide basis with minimal impact on yields.

The endangered species regulation affects agricultural credit markets because of the potentially substantial loss in returns for any particular farm or region of the state. A restriction on water availability or land use having small aggregate impacts could still have large local effects. Further, since it is difficult to predict where these local effects may occur, the impact causes considerable uneasiness among producers and lenders. The legislation and regulations relating to endangered species are incredibly complex, and the processes for listing a species and determining the appropriate actions upon listing are cumbersome and costly. No one seems satisfied with current procedures, and farm groups such as the National Cattlemans Association and the American Farm Bureau Federation have urged reforms to allow some consideration of the economic costs associated with listing a species. In the current political environment, however, it is unlikely that such reforms will prevail (Gardner). From the viewpoint of production agriculture and farm lenders, the best feasible reforms may include more efficient and less costly procedures for aiding listed species.

Water Policy

In California, endangered species issue often correlate with water issues. A major part of the Miller/Bradley Act (officially, Title 34 of the Reclamation Projects Authorization and Adjustments Act of 1992) deals with taking water from agriculture for use in aiding certain species of fish. But in addition to taking water away from agriculture, Miller/Bradley changed the way water contracts work for the Central Valley Project. The most important concern for lenders and others making long-term investments in irrigated agriculture are provisions that limit the contract length for renewed water
contracts. Until the comprehensive environmental impact assessment is completed, water contracts are limited to two or three-year periods, rather than the current 20 or 30-year contracts. Such a limit simply prevents long-term investments that depend on access to irrigation water for profitability. In the long run, if water markets materialize, a more efficient water system may emerge with the price of water better reflecting its value for alternative uses. However, in the short term—a period that may last for decades—irrigation water users have less security. These policy changes mean water may not be available for some individual farms, therefore, threatening farmers' income from agriculture. Naturally, the potential for a substantial drop in farm income or asset values makes lenders cautious in these markets.

**Pesticide Regulation and Registration**

Pesticide use is regulated by a variety of rules with several Federal legislative sources, and several are up for renewal in the next year or so (Table 1). These regulations are designed to help meet a variety of air quality, water quality, species habitat, worker safety, and food safety goals. The added costs to agricultural production have remained manageable in most cases as alternative practices or products have been found when restrictions are imposed. However, limits on pesticide availability and use are becoming more binding, and nothing on the horizon suggests a reversal of that trend.

Two concerns are particularly crucial for credit markets. The first is the "voluntary" withdrawal of so-called minor-use pesticides. In these cases chemical companies consider the regulatory burden for reregistration too large to cover the potential profits from continuing to market the chemical. This reregistration problem is particularly important in California where such a variety of crops are grown, each with a relatively small, but inelastic, demand for a specific chemical. In some cases an industry's economic viability depends on the availability of a chemical, but the fixed cost of reregistration makes supply of the chemical prohibitively expensive. Clearly, lenders want to know which industries may be vulnerable to these pressures. Public policy
Table 1. Environmental Goals and Policy Instruments Intended to Affect Agriculture

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<th>Water Quality (Clean Water Act)</th>
<th>Air Quality (Clean Air Act)</th>
<th>Soil Conservation (Farm Acts)</th>
<th>Endangered Species Protection (ESA)</th>
<th>Food Safety (Food, Drug, and Cosmetic Act)</th>
<th>Worker Safety (FIFRA)</th>
<th>&quot;Sustainable&quot; Agricultural Production (Farm Act)</th>
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<td>Conservation Compliance</td>
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<td>Biotechnology Regulation</td>
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<td>Agricultural Research</td>
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<td>Water (irrigation) Regulation</td>
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* The X's indicate area regulated explicitly in an attempt to foster achievement of the goal at the top of the column. Regulation that affects the goals, but not as part of a program directly intended to attain the goal, has no X entry. For example, irrigation regulation may well affect soil conservation, but irrigation regulations are not an explicit component of soil conservation laws.

Source: Gardner
could respond by developing a more efficient system for demonstrating the safety of chemicals, taking into account the size of the potential market.

The second issue relates to the difficulty of predicting future chemical restrictions. Both producers and lenders benefit when they know well in advance that the use of a chemical will face (or likely face) new restrictions, and adjustments are much less costly. To date, restrictions on chemical use in agriculture have been relatively gradual with substantial lead time. For example, the recent actions against methyl bromide will have major impacts after the year 2000. These impacts may well be large at the time, but growers and lenders will have had several years in which to adjust investments and practices (see Hyde et. al. or Gardner for more on the methyl bromide issue.)

In evaluating environmental policy applied to agriculture, we must confront disputes about the science and how to apply the relevant science to regulation. Disputes about how to value productive activity relative to potential environmental costs also exist. However, in these disputes there is a degree of consensus that the process of regulating the environment is far too cumbersome, confusing, and costly. This results in a lack of clarity and security in planning and investing in agriculture. This lack of security has the most negative impact on financial markets for agriculture. Two public policy goals in this area are to clearly define the property rights involved and streamline the decision-making process. All parties must recognize that streamlining means fewer avenues for appeal and delay, even when the result is adverse to one’s interests.

V. Agricultural Policy and Farm Finance

The policies discussed here affect demand for credit and the perceived credit worthiness of farms and farmers. They are discussed in terms of how recent changes may have changed the credit market positions of participants on both sides of the market. More people understand that policy changes and the potential for
change themselves create risk. In addition, reducing federal income support to agriculture has become a recent trend. These changes may mean lower income—at least in the short run—for producers who continue to operate traditionally. This lower income does not relate to changes in risk or income variability, rather it relates to changes in the expected returns from investments.

**Commodity Programs**

Income from farm program payments have been declining since the implementation of the 1985 Farm Bill and will almost surely continue to decline under the upcoming 1995 Farm Bill. Many anticipate a lower level of payments and have accounted for the decreased payments in their income projections for the program grains and cotton. However, payments play a less vital role in California than in other major farm states, comprising only about one percent of cash receipts for California agriculture. The two significant California commodities dependent on payments are cotton and rice. Rice is the most payment-dependent commodity of all. In recent years, about one-third of gross receipts from rice production have come from deficiency payments and marketing loan gains. (That proportion will be lower in the future because expanded exports to Asia will keep market price for Japonica rice varieties relatively high.) For rice and cotton the method by which the 1995 Farm Bill achieves the expected reduction in budget costs is important to growers and lenders. For both growers and lenders, increased planting flexibility would allow more efficient use of land and other resources. Analysts expect the 1995 Farm Bill to include an increase from the current 15 percent in the base amount of land in the nonpayment category.

**Trade Policies, NAFTA and GATT**

At the end of 1993 two major trade issues for California agriculture moved closer to resolution. For several years no one knew whether or not the North American Free Trade Agreement (NAFTA) was going to happen. Now at the beginning of 1994, NAFTA is a fact, and the question is what it means for agricultural mar-
kets in California. Analysts project a modest expansion in exports and relatively minor added import pressure for most commodities. Growers and lenders need a commodity by commodity assessment, however, to know more precisely what opportunities or pressures NAFTA created. Non-tariff trade barriers—import bans, quotas, and required import licenses—have all been converted to tariffs and these tariffs, and these will eventually reduce to zero. In a few cases export gains may be immediate because trade barriers were reduced at once. For most commodities with significant barriers, however, tariffs will gradually move to zero so the trade will expand gradually as well (Sumner, 1993a).

Seven years of Uruguay Round General Agreement of Tariffs and Trade (GATT) negotiations also came to a resolution at the end of 1993. We now can be relatively confident that there will be a GATT agreement because it is unlikely to face serious difficulties in the U.S. Congress. We also know generally what the agreement contains—lowered export subsidies, no change in domestic farm programs, conversion of non-tariff barriers to tariffs, and lower tariffs. The specifics of the tariff reductions for each commodity in each country will become available in the winter and spring of 1994. This will allow analysis of the opportunities created for California agriculture. Overall, we expect an improvement in market prospects for commodities with export potential. We expect major gains for rice, tree nuts, feed grains, wheat, and several other commodities that benefit from lower tariff barriers. The Uruguay Round also begins a long-term process of regularizing agricultural trade and reduces the chance that trade can be blocked arbitrarily based on unfounded sanitary, phytosanitary, or food safety claims. Overall success in the GATT has improved the income potential for California agriculture which is good news for growers and bankers.

**Crop Insurance and Disaster Policy**

Despite large subsidies most farms do not participate in Federal Crop Insurance Corporation (FCIC) programs. For several major California crops no insurance exists—for example, lettuce and strawberries. Where
participation is high, crop insurance is generally a money-making investment and not insurance at all. In Montana, wheat has had a return of $4.00 per $1.00 of premium.

For most commodities and for most growers, there is relatively little subsidy. Premiums exceed the expected returns. In those cases growers usually choose not to buy FCIC insurance. However, when growers observe that the potential payoff from acquiring a policy is larger than the associated premium, they clearly benefit by signing up. Unfortunately for the government program, it is very difficult for FCIC to identify producers who are likely to cause large pay-outs and adjust premiums accordingly.

In recent years the cost of FCIC to taxpayers has been in the range of $1 billion per year. One fact we can count on is that FCIC will change radically in the near future. No one should make long-term investments under the assumption that Federal Crop Insurance will be available in its current form. A substantially changed crop insurance system will not significantly impact financial markets for California agriculture because crop insurance now plays a relatively small role. For those commodities for which year-to-year yield variability is a major factor, alternative institutions such as private insurance or conditional lines of credit are, or will, become available.

Disaster aid has periodically infused large funds into agriculture. In 1993, $3 billion was allocated primarily for the Midwestern Flood. California sometimes receives aid, but it is not something one can bank on. Disaster aid is simply too political to be reliable. A few years ago, growers who suffered losses were praying for a drought to hit Kansas. They figured that if Senator Dole's farmers were hurt, there would surely be disaster aid, and everyone would get a share. California farmers clearly cannot rely on a program this sensitive to luck. Further, disaster policy itself has become so costly that the pressure is mounting for reform (Sumner, 1993b).
VI. Conclusions

Two conclusions seem appropriate based on the analysis presented in these proceedings. First, government policies seem to have a different place in the minds of analysts, producers, and those in agribusiness than they did in the recent past. In the past people in agriculture saw government action as a way to smooth agricultural variability. Programs can still do that. However, we now emphasize the instability or risk associated with government programs themselves. While many institutions can help smooth year-to-year fluctuations in cash flow, little can be done with public policy to relieve the potential for a major, one-time drop in income from a policy shift.

Second, investing in more information and analysis is one appropriate response to all new situations. Producers, lenders, and others in the market look to improve their investment performance by learning more about likely consequences of their actions. Information itself can have public-good characteristics, and so one role of government is to provide or fund information, research, and analysis related to agricultural markets. In fact, much of the useful information concerning agriculture and credit markets comes from state or federal government. Some information and analysis is prepared by private firms that use what they prepare. Other firms prepare such information and analysis to sell to those who use them. In each case much of the basic data and research has a government source. Some private firms that use the information appropriately prepare and sell the information and analysis. But some efforts by government are important as well. I will conclude by stressing the importance of maintaining data, research, and efforts to make that information widely available.
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Agricultural Risk: Definition, Assessment, and Management

Charles Hyde, David Zilberman, and James A. Chalfant

I. Introduction

The purpose here is to analyze risk and uncertainty in agriculture. Some of the important questions include: How do we assess the level of risk? How is it changing? How can we best cope with it? Some perceive that agricultural risk has increased over time, and often point to the number of bankruptcies as proof. At the same time farmers can choose from a larger array of risk management strategies available than ever before. We must carefully assess both the definition and the sources of risk and uncertainty to answer the questions posed above.

We distinguish between risk and uncertainty as follows. Risk is when the value of some variable involved in an economic decision is not known but objective probabilities can be assigned to each feasible outcome. Uncertainty is when probabilities cannot be assigned. The majority of economic analysis deals with risk since this concept is easier to quantify and assess analytically.

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Rainfall is an example of agricultural risk; most areas have good historical records of rainfall, and these data analysts can examine to calculate objective probabilities to assign to different rainfall outcomes. An example of uncertainty is the effect of the North American Free Trade Agreement (NAFTA) and the General Agreement of Tariffs and Trade (GATT) on agricultural output and input prices. Of course, one can assign subjective probabilities to various effects, but there is little to guide our judgment here.

The relative importance of risk in agriculture has declined while the relative importance of uncertainty has increased. This results, in part, from an open economy and the introduction of environmental regulations. We need to respond with a better understanding of both actual and optimal strategies for dealing with uncertainty.

We presume that risk and uncertainty are important problems in agriculture. Most analysts widely accept that farmers are risk-averse—they prefer less risk to more, all other things equal. The fact that farmers typically engage in various forms of on-farm diversification to reduce overall exposure to risk underscores this premise. Also, programs stabilize prices, often resulting in lower welfare for risk-neutral farmers and thus, that variability may be undesirable only to the extent that farmers are risk-averse, and the variability is not anticipated. Farmers’ support of price stabilization schemes reemphasizes that they avoid risk when possible.

The first and perhaps most fundamental question is “what are the important variables about which farmers are concerned with respect to risk and uncertainty?” Much previous analysis focused on income variability, though clearly consumption also needs consideration. Consumption smoothing activities typically undertaken (i.e. saving) support this notion. Any general analysis of risk and uncertainty should, at a minimum, consider how these two variables (consumption and saving) are affected. We shall show that the above definition of risk may be inadequate, in some respects, if farmers prefer mainly to avoid disaster. Clearly, as the first step in risk and uncertainty analysis we should identify what type of
risk is important, and this requires a clear understanding of farmers’ preferences.

We show that one should carefully to take into account the relationship between different sources of risk in assessing the overall effect of any change in farming conditions, particularly where a large fraction of producers are exposed to correlated risks, such as weather-related risks in production, resulting in a situation where output fluctuations affect market price. Similarly, when assessing the effect of policy-related uncertainty on farmer welfare, one must consider coherent policy scenarios rather than piecemeal effects in order to give a balanced view of possible effects on farmer welfare. Lastly, one needs consider all available risk management instruments, both on and off-farm, in order to assess accurately the risk and uncertainty faced by farmers.

In the next section we examine several different notions of risk and uncertainty and their implications for behavior.

II. Risk and Uncertainty—What Do We Really Mean?

The expected utility hypothesis is the dominant paradigm for incorporating risk considerations into economic analysis. This hypothesis states that if a producer’s preferences conform to some apparently reasonable axioms, then when making production decisions in the presence of risky outcomes, individual welfare can be represented by a weighted-additive combination of the utility obtained from each possible outcome. The weights used are the probabilities assigned to each outcome. For example, suppose that a decision-maker derives utility from good x, represented by \( U(x) \), and the variable x can take on only two possible values, \( x_1 \) and \( x_2 \), with probabilities \( p_1 \) and \( 1 - p_1 \), respectively. Then the decision-maker’s expected utility can be represented by \( p_1 U(x_1) + (1 - p_1) U(x_2) \). The individual’s decisions, in turn, can be modeled by the problem of maximizing expected utility. This presents useful results, allowing the decision-maker’s objective to be represented in a relatively simple way. Risk aversion,
typically characterized by the assumption that utility increases at a decreasing rate in the relevant variable (i.e., income, yield, consumption, etc.), ensures that, offered two outcomes with the same expected value, individuals strictly prefer the outcome with lower variability. The plausibility of the approach and its analytic attractiveness explains its widespread use for solving decision making under uncertainty.

Risk aversion is primarily a static concept where an individual is viewed as having a particular psychological disposition toward random outcomes under a known probability distribution. Expected utility is a simple concept, but it captures risk behavior that is, by nature, more complex and dynamic. In the business world we could have a risk-neutral or even risk-loving agent (by the utility function criterion) who would outwardly behave as if he were risk averse because his decisions would reflect the dynamic intertemporal nature of a "going concern" subject to the risks of bankruptcy, or even too few resources remaining after an adverse outcome to remain a viable firm. It is much like a gambling game where the player has a finite purse, and the game has an expected positive, although modest, return. The player chooses a strategy for the amount that he bets on each play to maximize the expected value of his winnings after a long but finite period of play, and if he loses his cash reserve, the game is over.

An alternative explanation offers another view of how individuals make decisions under risk. This approach proposes that a ranking of priorities better characterizes farmers' preferences. This implies that farmers make decisions in a sequential manner, ensuring that they allay primary concerns and then turn their attention to matters of lower priority. Telser's safety-first rule captures this notion, wherein producers are assigned to maximize expected profits subject to the constraint that they not fall below some threshold level (e.g. subsistence, bankruptcy) with probability higher than some pre-specified level. Many feel that this is a more plausible representation of farmers' decision making under uncertainty, if only because it is
a decision procedure which is much easier to operationalize than the expected utility approach.¹

The nature of the safety-first rule suggests, however, that farmers may not be inherently worried about variability. They worry only to the extent that it affects things that they really care about. This seems like an intuitive idea but does not appear to motivate or follow from the treatment of risk in the expected utility model. Thus, a change which adds to the variability in income or consumption may not affect the welfare of farmers if their primary concern is avoiding bankruptcy, and the effect of the change on the likelihood of this event is negligible. Indeed, by this interpretation of risk, farmers could suffer an increase in risk due to a decrease in expected profits alone, with variability remaining unchanged. Since the traditional measure of risk takes into account purely variability considerations, the risk in the above scenario must remain unchanged under this definition. This “probability of disaster” approach implies that declining real farm incomes could possibly be the underlying motivation for the increased concern with agricultural risk, rather than increased variability of farm incomes.

The preceding discussion underlines the importance of properly defining what we mean by risk. The concept of average returns may mean just as much as variability to a farmer’s perception of risk. Given that policy changes affect both components in possibly offsetting ways, this observation is relevant for guiding policy analysis.²

The discussion so far has focused on the definition of preferences and the implications for how we define risk. Essentially the same implications exist for uncertainty. While uncertainty is not quantifiable by nature,

¹ The advantage in terms of operational simplicity derives from the fact that the safety rule specifies the problem in terms of profit instead of utility. The issue of risk is dealt with separately, again in terms of profit, in the constraint. Solving the standard formulation in terms of profits instead of utility would simplify it greatly, but the problem is that this implies risk neutrality.

² For instance, a price stabilization scheme will reduce price variability (lower risk) while reducing average returns (depending on the definition, it may increase risk).
it helps to assume that the overall level of uncertainty increases as the number of uncertain events increases. A farmer's intuitive perception of the effect of this uncertainty on his welfare increases if, for a given "level" of uncertainty, expected profitability falls. This seems reasonable if, for every risk interpretation of the uncertainty, the probability of bankruptcy, or some other important threshold level being reached, increases as expected profit falls. Similarly, farmers may not suffer adversely from a perception of increased uncertainty in the sense of uncertainty over more factors if they do not feel that the accomplishment of important objectives is any less likely.

Another question related to identifying preferences is what variables exist in which farmers want to make less subject to risk and uncertainty? Analysts commonly focus on income variability mainly because of the analytic ease of such a specification. If we consider consumption to be the variable which specifies farmers' preferences, then we must include a broader array of risk management strategies in our analysis. Risk aversion motivates consumption smoothing, and the ability to adopt simple strategies, such as saving, needs to be taken into account. For example, in the extreme case in which farmers have access to unlimited credit with certainty about terms, income variability does not relate to consumption variability. In fact, the consumption ability effectively equals zero, regardless of income variability. Farmers could simply use their unlimited credit to carry them through the poor years and replenish it during good ones.

This points to the importance of assessing the full range of financial instruments available to farmers when assessing consumption variability. We must also recognize that consumption is clearly a function of income; thus, a careful distinction between the utility obtained from risk reduction in income and in consumption needs to be made. A model incorporating standard notions of risk and uncertainty with respect to important discrete outcomes concerning both income (bankruptcy) and consumption (subsistence), is relevant for risk analysis.
III. Sources of Agricultural Risk and Uncertainty

We categorize the main sources of agricultural risk and uncertainty as follows:

Production Risk

Weather variability is the main factor here. Growers in California face the possibility of frost, drought, and other vagaries every year. Farmers generally understand the probability distributions involved here (even if only intuitive), and thus, we describe this as risk. We can also group factors such as pest infestations in this category since they tend to be weather-related. Improvements in technology tend to decrease this source of risk over time. Access to irrigation water also drastically lowers this source of risk to many farmers, although recent events have shown that prolonged drought may induce policy changes which increase risk due to increasing uncertainty over future delivery quantities. However, it helps to consider this type of uncertainty as policy-related.

Output Price Risk

According to the survey conducted by Blank and McDonald (1993), California farmers consider market price uncertainty to be the largest source of risk. Farmers face output price risk when producing goods for which little or no domestic price regulation exists or for which regulated prices are difficult to anticipate. For many California commodities, local or state production represents a large percentage of total output in the market (e.g. grapes, lettuce); thus, decreases in production typically increase price. As a result, while production and price risk, when assessed in isolation, may appear large, actual profit risk may be much lower due to the relationship between production and prices. Production risks affecting California producers often will be widespread enough to affect market prices in a way that partially offsets the effects on total revenues. Prices will rise in “bad years.” For those products for which a significant fraction of total market output grows over a geographically large area (e.g. wheat), such relationships between price and quantity
unlikely hold. Again, it helps to distinguish between price risk due to normal market randomness (partly related to production variation) and the price risk due to policy intervention and changes. Price risk due to policy intervention and changes relates more the nature of uncertainty. Exchange rate risk can vary significantly for farmers who rely on demand in foreign markets. Demand fluctuations translate into price variability, and such fluctuations can be difficult to predict.

**Input Price Risk**

Variability in the prices of factors used in production, such as wages and pesticide costs, also contributes to profit risk. In addition to the obvious direct effect on profits, indirect effect also occur since the set of required inputs is, to some extent, determined by the technology used for production. Thus, input price variability affects the choice of production technology. Capital intensive technology provides risk benefits with respect to input costs since, in the short run, the farmer is exposed to risk in variable costs. These variable costs will comprise a smaller portion of total costs with capital-intensive technology. An example would be the use of mechanical harvesters instead of manual labor if farmers perceive wages to be unpredictably variable, but the capital investment locks the farmer into that particular crop, and intertemporally, he assumes more risk because he is vulnerable to price fluctuations (and a changing mean) for the commodity. Uncertainty arises due to government policy regarding immigrant labor. As a result, economists predict adopting capital-intensive technology would be more likely when variable costs are uncertain and less likely when farmers have financial or other instruments to cope with this uncertainty.

We also consider credit an input to production, so uncertainty over the future cost of funds qualifies as an important source of risk. For example, in the early 1980s when many farmers found themselves unable to service the debt they had purchased earlier and declared bankruptcy. Although we argued above that the use of capital-intensive technologies reduce risk, we must also recognize that there is risk associated with debt financing of this
technology. If the perceived risk with respect to interest rates is low relative to that associated with inputs such as labor, then farmers may decide that, even taking into account the increased credit risk, they are better off investing in the low variable-cost technology. We will argue later that changing credit policies may be responsible for much of the perceptions of increased risk in agriculture.

**Input Supply Risk**

As with input price risk, input and supply risk contributes to total cost and profit risk. In California, security of water availability has become an increasingly large source of risk for some growers. Since the source of this risk is a function of both natural phenomena (duration of drought) and policy debate, this risk involves a large element of uncertainty. The existence of this kind of risk affects the choice of production technology of farmers, making water-efficient production methods more attractive. Other important sources of this kind of risk for some farmers include access to drainage, the ability to continue pumping groundwater, and access to pesticides. Again, policy determines the risk or uncertainty involved and we cannot easily quantify these. Most of the uncertainty and risk concerns whether inputs will be allowed, not whether any will be available (as with a shortage of a key input).

**Technological Risk**

This type of risk also affects the choice of production technology and management strategy. Farmers typically go through a phase of learning and experimentation after making changes in the method of production, and a lack of familiarity with new technologies contributes to production risk. The perceived risk associated with becoming proficient with alternative technologies affects the final choice. With respect to the use of inputs like pesticides, farmers may also express concerned with uncertainty regarding possible future liability for health damage caused to other parties. The increased strength of the environmental lobby and consumer interest groups serves to increase uncertainty in this respect.
Government Policy Risk

Direct government payments, including price supports and enhancements, represent a significant source of farm income for many farmers.\(^3\) The disaster assistance program, another example of a government funded program, lowers agricultural risk. Since government policies have a tendency to change, uncertainty always exists concerning the future of farm support programs. The recent debate regarding the management of the federal crop insurance and disaster assistance programs indicates the uncertainty surrounding the existence of some programs. Because of the importance of these programs to many farmers, this represents one of the more important sources of agricultural risk.

As indicated in the above discussion of the different sources of risk, the prospect of changes in government policy contributes to the perceived risk and uncertainty in almost all of the previous categories. Farmers have the most difficulty dealing with this source of uncertainty since predicting the direction which policy take requires omnipotent powers. Policy changes often dramatically affects farmers—for example, the banning of certain pesticides requires significant changes in the way farmers manage their operations. Farmers in the Central Valley, with the passage of the Bradley-Miller Act, face the prospect of losing of irrigation water, without which agricultural production of the current type is virtually impossible. The recent state legislation requires environmental measures to be included in all water projects. This underscores the general feeling that new projects will be developed. Thus, even ignoring uncertainty regarding various price and income support programs, this source of uncertainty may be very important to farmers’ perceived risk of bankruptcy. The uncertainty due to the GATT and NAFTA treaties is also policy-induced risk. The occurrence of a trade dispute would likely affect output prices due to affecting foreign demand.

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3 Total direct payments to U. S. farmers amounted to $9 billion in 1992, or 5 percent of farm income.
Off-Farm Income

It is estimated that approximately 60 percent of all farmers or their spouses work off farm. This suggests that on-farm sources of risk represent only a portion of the total income risk faced by many farmers. Although we consider off-farm risk nonagricultural, it impacts the overall welfare of many farmers. On the other hand, off-farm income tends to be less risky than on-farm income, contributing to the attractiveness of this practice.

IV. Assessment of Agricultural Risk

We consider here some important factors in assessing agricultural risk.

Common Measures

We have argued that both unpredictable variability and the level of expected return are important components in assessing total risk. We must also recognize that most changes affect both of these components. For example, the use of pesticides reduces income variability for individual farmers due to reducing the probability of infestation, but it increases expected return since infestation results in low yields. Furthermore, pesticides cost money which also affects the mean level of returns. We need to incorporate this general notion into our analyses to accurately assess risk implications from changes in agriculture.

Several common measures of risk exist. The first, risk premium, associates with uncertain income. If an individual has no preference towards two assets—one producing certain income, and the other producing uncertain income—then the income of the certain asset serves as the certainty equivalent of the income produced by the uncertain asset. The certainty equivalent is less than the expected value of the uncertain outcome. The risk premium for an individual is the difference between the expected value of the uncertain outcome and the certainty equivalent. The risk-averse individual requires a larger risk premium. However, we must know the individual’s degree of risk aversion, at least implicitly, to calculate the risk premium.
We also use variance to measure risk. Variance measures the dispersion of outcomes around the expected value, and it is simple to observe and easily motivated. Mean-variance analysis represents a risk-averse individual's objective function as the difference between expected profit and a fraction of the variance of profit, and then, we make production decisions to maximize this expression. Under some common assumptions about variance and the utility function, expected utility maximization equals mean-variance analysis.

Although we can obtain information regarding variance more easily than risk premium, the latter is more informative because it accounts for the risk attitudes of the decision-maker. For example, a risk-neutral farmer is indifferent to variance, as long as expected returns do not change. In this case risk does not increase with variance. Variance, of course, makes a statement only about the probability distribution of a random variable of interest.

Output-price risk motivated the development of another measure—the probability of bankruptcy. This is probably the simplest of the three measures mentioned to calculate and has the advantage that it is conceptually simple and easily interpretable. Furthermore, if farmers rank their preferences, then the probability of bankruptcy is possibly the most relevant measure. Farmers may also consider other important goals, such as an income sufficient to support a minimum standard of living, or level of wealth to provide a bequest of some minimum size. At this point little data suggest the relative importance of such goals for decision making under uncertainty. As for assessing the magnitude of uncertainty, no widely accepted measures exist. This makes incorporating this concept into analyses difficult.

By examining the potential impacts of the “Big Green” bill in California, we witness the importance of the effects of uncertainty on farmers and the importance of distinguishing between different types of risk. This bill proposed the banning of all pesticides known to cause cancer and reproductive damage. The effect on expected farm income of the proposed ban on some pesticides would have minimally impacted producers, largely due to the
Table 1. Simulated Impacts of a Pesticide Ban on Five Crops in California

<table>
<thead>
<tr>
<th>Crop</th>
<th>Impact</th>
<th>Output Price Change</th>
<th>Producer Revenue</th>
<th>Total Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Percent</td>
<td>Dollars</td>
<td>Dollars in Millions</td>
</tr>
<tr>
<td>Almonds</td>
<td>Mean</td>
<td>-15</td>
<td>21</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>High estimate b</td>
<td>-34</td>
<td>59</td>
<td>-100</td>
</tr>
<tr>
<td>Lettuce</td>
<td>Mean</td>
<td>-9</td>
<td>57</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>High estimate b</td>
<td>-28</td>
<td>175</td>
<td>-81</td>
</tr>
<tr>
<td>Five crops</td>
<td>Mean</td>
<td></td>
<td></td>
<td>-22</td>
</tr>
<tr>
<td></td>
<td>High estimate b</td>
<td></td>
<td></td>
<td>-422</td>
</tr>
</tbody>
</table>

a The total effect is the sum of the change in producer revenue and consumer spending. This holds exactly in the mean but, since the high estimates for consumers and producers correspond to different situations, the sum is not exact for the high effect.

b The high estimate is that value which may be exceeded with a 5 percent probability.

possibilities for substitution and the inelastic demand for specialty crops produced in California (Zilberman et al., 1991). Consumers would have suffered most of the welfare losses associated with the bill as a result of having to pay higher prices. Farmers strongly opposed the bill because of possible effects rather than expected effects. That is, while the decrease in expected crop revenue was only 0.6 percent, there was a five percent probability that this decrease would be a significant amount—two percent of crop revenues (Zilberman et. al., 1991); see Table 1. The worst case scenario may have resulted in bankruptcy for many growers, and this greatly increased their assessment of the associated risk.4

4 This is especially true in the short run. In the longer run, supply of specialty crops outside of California may increase and that may lead to reduced prices and reduced revenues for producers. This long run consideration might also affect farmers’ objections to the bill.
Aggregate vs. Component Risk

Factors which increase the level of risk faced by individuals potentially cause secondary effects through markets, leading to increased profitability and thereby, reducing overall risk. Carter et. al. (1987) proved this in the context of the effect on growers in the Imperial Valley of the UFW strike in 1979. They showed that the effect of the strike, which indicates risk regarding labor availability, actually increased the profits of the affected farmers due to opportunities for factor input substitution and the inelastic demand for output. In this case the ability of farmers to hire nonunion labor and to use mechanical harvesting, combined with the fact that almost all U.S. and Canada winter lettuce consumption is supplied from this region, resulted in higher profit levels for farmers. The strike would have had to reduce output by about 80 percent to successfully reduce farm profits—a level far higher than that achieved. Lettuce farmers in this region benefited from increased labor supply risk, and this decreased their risk of financial failure. For other California crops with similar properties, labor supply risk may not generated so much concern.\footnote{The special circumstances of this case should be noted: The Imperial Valley is adjacent to the Mexican border and thus is close to a large supply of immigrant workers, and many agricultural workers converge on the area during the “quiet” winter months.} This highlights the importance of taking a complete perspective in risk analysis and identifying the variables concerning farmers (e.g. profits, not the availability of labor).

The current debate over the possible effects of NAFTA on agriculture also provides a good example of how partial effects may differ from total effects. Farmers growing labor-intensive crops will be adversely affected by the treaty. However, farming and processing in Mexico will provide greater investment opportunities, which could benefit some California farmers.

Inter-Sectoral Risk

In trying to assess the level of agricultural risk, we must recognize that there are important links between agriculture and nonagricultural sectors of the economy,
and changes in the risk environment in nonagricultural sectors affect farmers. Farmers often own nonagricultural interests (Zilberman et. al., 1993). If farmers mortgage their farm land to buy residential real estate, they will suffer in periods of recession when real estate rents are insufficient to make mortgage payments. Furthermore, reductions in the value of urban real estate reduce the farmers' ability to obtain extra credit.

Significant overlap exists between ownership of farming and agricultural retail services in California. We observed this in the case of pesticide services (Zilberman et. al., 1993). For such farmers, not only will banning the use of some pesticides affect the productivity of their farms but also the sales and profitability of their pesticide retail business.

MacDougall et. al. (1992) show that the effect on risk of increasing on-farm costs of meeting drainage regulations depends importantly on the financial environment (Figure 1). Increasing costs in the late 1980s would have resulted in lower solvency levels, but this effect was mitigated, to a large extent, by lower interest rates and higher output prices in the early 1990s. These factors resulted in farmers carrying more debt at a lower cost and allowed funding of the costly outlays required to comply with drainage regulations without risking bankruptcy.

**Figure 1.a.** Effect of Drainage Costs on Solvency: 1987

![Diagram showing the effect of drainage costs on solvency](image-url)
This emphasizes the importance of accounting for the related environment when assessing the risk due to a single factor (stringency of drainage regulations in this case). Note that the type of risk we refer to here is the probability of bankruptcy.

Government policies, such as input and credit subsidies, can affect the incentives for adoption of new technologies, and thus income distribution, within a sector. However, the nature of the effects depends importantly on risk attitudes and credit limitations (Just and Zilberman, 1988). In assessing how policy changes and the risk perceived to be associated with such policies affect different groups within the farm sector, we need to take into account related changes which affect credit availability. This relates, in particular, to the changes which have occurred recently in the lending criteria of financial institutions which we discuss in section 6.

Changes in liability and bankruptcy laws help determine agricultural risk. Federal laws passed in 1986 make it easier for farms to file for bankruptcy and asset protection with the establishment of "Chapter 12." This effectively reduces the risk faced by farmers by lowering their financial liabilities to creditors. This benefited many farmers, shown by the fifteen-fold increase in the number of farms filing for bankruptcy (MacDougall et. al., 194
1992). Thus, while superficially the data show that risk increased during this period due to higher rates of bankruptcy, this change contributed in reducing the risk faced by farmers. It allowed them greater flexibility in handling their financial problems.

Short- vs. Long-Run Risk

The effect of risk on investment decisions in agriculture depends importantly on the time frame of the risk. If people believe that risk has increased—for example, due to factors related to the recent recession—then because recessions are viewed as short-term phenomena, farmers will not factor this change heavily into decisions which have important effects for decades to come. The eventual effect of the recent drought on irrigation technology adoption provides a good example. For the first several years of the drought, irrigation practices changed very little due to the perception that the effects of the drought would be short term. When policy developments in the latter years of the drought began to indicate that water allocation patterns could change permanently, adoption of more water-efficient technologies rapidly increased.

The NAFTA and GATT treaties are two of the more prominent sources of long-run risk facing agriculture. Although we can identify the components of agriculture that will likely be affected by these treaties, it is difficult to assess the net effect on agriculture. NAFTA will most likely result in both larger supply and demand for agricultural products. California growers of vegetables and fruits will face more intense competition from growers in Mexico, with more labor-intensive crops becoming less profitable in California. Establishing fruit and nut-bearing crops requires a long-term investment, and uncertainty over the outcome of these treaties will likely affect the rate of new and renewed investment in these crops but not in annual crops and livestock where returns are obtained more rapidly. The discussion above suggests that farm credit conditions for long-term loans may be affected by the trade treaties since they will potentially adversely affect the long-term profitability of California farming. On the other hand both NAFTA and
GATT present new investment opportunities to California farmers, and that may reduce overall risks.

**Agricultural vs. Nonagricultural Risk**

By looking at the relative rates of failure of agricultural versus nonagricultural firms, we can compare the risk in different sectors. Figure 2 shows that, while the failure rate in agriculture was 70 percent higher than that in nonagriculture in 1985, this trend had reversed by 1990 and failures occurred at a rate about 35 percent lower than nonagriculture. These data suggest that, based on our alternative definition of risk, risk in agriculture is now lower both in an absolute sense and relative to other industries than it was in the mid 1980s.

**V. Risk Management Strategies**

It helps to categorize risk management options for farmers as either on or off-farm risk management strategies.

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**Figure 2.** Rate of Failure, Agriculture, and All Business

![Graph](image-url)
On-Farm

Diversification serves as the most important risk management tool for California farmers (Blank and McDonald, 1993). The joint production of goods for which yield, input, and output price variations are not highly correlated results in lower total income risk. This is analogous to portfolio diversification in finance. However, studies have shown that a tradeoff exists between specialization and on-farm diversification (Duncan, Cole, and Crane, 1993b). A farmer develops expertise in areas of specialization, and diversification limits the degree of expertise farmers can attain in each of the activities undertaken. If farmers use on-farm risk management strategies, they should supplement them with off-farm strategies in order to provide the desired level of risk protection.

Crop diversification provides another important means of risk management with respect to input availability. Farmers often diversify into crops which have peak labor requirements at different times, in order to gainfully employ their labor (or themselves) over a period of time. Hiring seasonal labor poses significant risks, particularly if there is an inflexible, narrow time frame in which to complete a task—for example, grapes have to be harvested within a very specific period, in order to get the optimum sugar content. The possibility of laborers defaulting on their contracts generates another source of risk for farmers. Since laborers prefer longer contracts and farmers can direct labor at their discretion, significant risk benefits can arise from having a diversified operation which requires long-term tenure by laborers.

Farmers changed their behavior significantly toward the end of the recent California drought (MacDougall et. al., 1993). Technological change contributed to farmers’ ability to survive the drought. In particular, the use of more efficient irrigation technologies (e.g., drip irrigation) and high-value crops with lower water requirements reduced the risk of water shortages and thus, of crop failure at the farm level. The technological changes decreased water applications to some crops by as much as 50 percent between 1989 and 1991 in the Broadview water district (MacDougall et. al., 1992). The
decrease in application rates was smaller for more valuable crops like tomatoes, reflecting a rationing of water to its highest valued use. The existence of long-term contracts with processors and the distortion effects of government programs can potentially restrict crop substitutability. An extreme example of crop substitution occurred in the Central and Southern San Joaquin regions. The area, which previously supported low-value crops, experienced a 94 percent increase in fallowed land between 1987 and 1991 (MacDougall et. al., 1993).

The availability of groundwater also proved important for Central and Southern San Joaquin farmers in 1991 when project water deliveries were cut drastically; see Table 2. The total volume of pumped groundwater in the state more than doubled in the period 1987-1991, while it increased fifteen-fold in four water districts in Southern California (MacDougall et. al., 1992). Groundwater use, in association with the adoption of more water-efficient technologies, represented two important on-farm responses which effectively reduced the risk faced by farmers. MacDougall et. al. (1992) observe that over 80 percent of the increase in irrigation wells drilled during the drought correlates to the decreases in the stocks in CVP and SWP reservoirs.

Changes made by water districts represent an important class of strategies for California agriculture. Many districts implemented new pricing procedures during the drought to try to ration water more efficiently.

<table>
<thead>
<tr>
<th></th>
<th>Project water</th>
<th>Groundwater pumped</th>
<th>Acreage fallowed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>thousands of acre feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>1,818</td>
<td>189</td>
<td>109</td>
</tr>
<tr>
<td>1988</td>
<td>1,787</td>
<td>186</td>
<td>119</td>
</tr>
<tr>
<td>1989</td>
<td>1,954</td>
<td>196</td>
<td>148</td>
</tr>
<tr>
<td>1990</td>
<td>1,372</td>
<td>388</td>
<td>129</td>
</tr>
<tr>
<td>1991</td>
<td>511</td>
<td>677</td>
<td>211</td>
</tr>
</tbody>
</table>
and subsidized the use of more efficient on-farm technology (MacDougall et. al., 1993). The efforts of water districts to promote more efficient water use became more dramatic as the drought progressed (MacDougall et. al., 1992). These efforts reduced the collective risk of the district farmers by increasing the probability that total water supplies would satisfy demands for normal crop production.

Off-Farm

A large number of off-farm instruments also reduce agricultural risk. Some examples include securing off-farm employment for family members; the use of crop insurance, futures, and forward contracts; purchasing options; investing in nonagricultural business; debt financing; vertical integration; and the use of supply contracts for commercial buyers.

Start-up farmers face more risk than established farmers who have already capitalized their farms because a lack of equity leaves them more vulnerable to bankruptcy. For these farmers the use of off-farm financial instruments minimizes this risk. Start-up farmers rely less on debt financing in today's restructured financial environment, following the problems of the early 1980s. They use options such as leasing increasingly to gain control over assets since they perceive them to be less risky than debt financing (Duncan, Cole, and Crane, 1993b).

Many farmers increasingly rely on the use of off-farm incomes, and off-farm incomes represent an important source of diversification for many farmers. Over 70 percent of farms now derive significant income from off-farm sources. In fact, many farmers use this source of income not only to decrease total risk but also as a major source of income, without which survival would be impossible. Off-farm wages and salaries are typically very stable and adjust with the cost of living, and thus are almost risk free, ignoring the possibility of layoff.

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6 It is questionable whether such enterprises should in fact be considered as farms, however, as these farms often lose money consistently, and appear to represent more of a lifestyle choice than an occupation.
The use of vertical contracts between processors and farmers is also popular and clearly provides risk benefits for participating farmers (Zilberman et. al., 1993). Such contracts typically involve a guaranteed return to farmers for the exclusive supply of their produce to the contracting processor. The processor absorbs all or most yield risk. The processor essentially subcontracts the farmer to work in a classical “cost-plus” type of contract. The problems with this type of contract are well known, as the farmer has little incentive to economize on costs in such a relationship (Laffont and Trole, 1993). This represents a risk to the processor if they do not use contracts which safeguard against moral hazard. If processors have many alternative farmers to turn to for procurement, then the prospect of contract termination by the processor and the associated risk benefits may sufficiently motivate farmers to contract in good faith.

The use of crop insurance also provides an important source of revenue risk protection to California farmers. Blank and McDonald (1993) find that it is the second most widely used risk management tool, behind diversification, in California. They also observe that farmers are more concerned with input and output price fluctuations, suggesting that the demand for price risk management tools might exceed that for yield insurance. However, they note that the use of forward contracting and hedging is no more popular than crop insurance, suggesting that room remains for further development of tools tailored to California conditions. Extension has ample opportunity to increase farmers’ understanding and awareness of the available price insurance tools. It appears that risk awareness is increasing in agriculture, but progress in reducing risk has been limited due to the inaccessibility of some of the available management tools.

VI. Trends in Agricultural Risk

In order to identify trends in agricultural risk, we need to identify which groups of farmers to which we refer. Two very different types of American “farms” exist which face quite different conditions. Approximately 71
percent of all farms in the United States have revenues of less than $40,000, with an average annual farm income of less than $14,000 (Duncan, Cole, and Crane, 1993b). These farmers clearly rely on nonagricultural income to survive. The credit, and hence risk, environment faced by these farmers differs from that faced by the larger, more profitable farms which do not rely predominantly on off-farm income for survival. We identify several sources of increased risk in California agriculture over the past several decades and argue that traditional sources of risk (i.e. yield and price risk) have not changed much over this period. The identified sources may be the most important sources of increased risk.

On-Farm Risk

Changes in objective measures of risk related to crop revenue have been minimal and do not constitute the main source of changes in the agricultural risk environment. Historical data show that revenue per acre for some major crops has actually become less variable and has been trending upwards in recent years. This suggests that revenue risk has decreased in the sense of both risk definitions we have considered (Figure 3).

As the recent drought has shown, the performance of California agriculture seems immune to very adverse conditions. In the period 1988-1991, net farm income in California fell from $6.1 to $5.8 million, only a five percent decrease (MacDougall et. al., 1992). The heavy reliance on irrigation means that seasonal rainfall variability is irrelevant, except under the rare conditions of extended drought. Access to an ever-increasing array of pesticides, improved varieties, and other technological improvements contributes to reducing revenue risk.

While California agriculture in the aggregate survived the drought without much loss, we must not forget that some sectors, such as the livestock sector and farmers without secure water rights or adequate groundwater reserves, suffered extensively.

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7 By “objective” we mean measurable characteristics, such as the variance of prices and output.
Figure 3.a. Average Alfalfa Revenue/Acre

Figure 3.b. Alfalfa Revenue/Acre Variability
Figure 3.c. Crop Revenue/Acre Variability

Finance and Credit Risk

Changes in the credit rationing policies of financial institutions resulted from the financial crisis in agriculture in the 1980s. Traditionally, the criteria upon which agricultural loans were approved depended on the amount of collateral held by farmers. Hence, any farmer who controlled sufficient assets (especially land) could obtain credit. Access to credit is important from a risk perspective for farmers because it ensures that they can recover from short-term disasters (e.g., frost damage to trees) and continue to operate. Farmers who already hold equity benefit from such a policy. It benefits lenders, however, only to the extent that collateral (especially land) values remained stable over time, ensuring that the probability of recovering the value of the loan, through foreclosure on collateral, if necessary, is reasonably high.

Recently, the criteria for loan eligibility has moved toward performance-based measures so that ability to repay, or profit potential, is now more important in determining whether a farmer receives a loan. One explanation for this change in loan criteria is the introduction of Chapter 12 which reduces lender foreclosure on assets. Since lenders have much less discretion in asset foreclosure when the borrower is in default, it makes the collateral much less important as security on the loan.
This policy protects banks from making excessive amounts of bad loans due to temporarily inflated land values. However, it also deprives farmers who are assessed to have poor profit potential from an important back-up source of funding. Such farmers consequently face a larger probability of failure and thus higher risk. In addition, the variability of real interest rates on long-term debt has been much higher since the early 1970s, further contributing to total risk (Duncan, Cole, and Crane, 1993a); see Figure 4. More profitable farmers remain unaffected by the change in credit policy, assuming that lenders accurately assess profit potential. However, the increased risk associated with more variable long-term interest rates affects all farmers.

While the change in credit criteria has clear benefits, it also involves costs. The informational requirements of profitability assessments exceed those of collateral assessments; hence, information asymmetries will likely arise. Realistically, lenders will have imperfect information regarding profit potential, resulting in some "profitable" farmers being mistaken for "unprofitable" farmers and thus being denied funds despite being able to service the debt. Adverse idiosyncratic conditions will contribute to this information asymmetry. In this case, all farmers suffer from increased risk due to the policy change, and inefficient farmers exert a negative externality on efficient farmers. This characterization seems more realistic than that of perfect information since, in reality, many factors exist, unobservable to the lender, which will

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**Figure 4. Interest Rates on Agricultural Debt**

![Graph showing interest rates on agricultural debt from 1960 to 1993.](image)
determine the observed profitability of the farm (e.g. local infestations and rainfall variability). As long as creditors accurately assess changes in the ratio of profitable to unprofitable farmers over time, the magnitude of this negative externality should diminish as inefficient farmers who cannot cope with the increased risk are gradually forced out of business.

We observe another trend in a broadening scope of the financial instruments that farmers demand from lending institutions. Leasing arrangements may become more popular in the future, especially with start-up farmers as this allows assets to be controlled without the risk associated with debt financing. Land ownership has historically been seen as an integral part of farming, but farmers realize that it may not be wise to burden themselves with the debt associated with ownership, particularly given the declining long-term profitability of the sector (Duncan, Cole, and Crane, 1993b).

As farm size increases in order to maintain incomes under conditions of decreasing profit margins in agriculture, alternative forms of firm organization will likely become important. In particular, the use of corporate and cooperative forms of organization facilitates acquisition of equity, an increasingly difficult problem as farm size grows. Also, the use of limited liability structures facilitates the intergenerational transfer of farms without the need for complete recapitalization of each generation. Competition between suppliers of agricultural financial services will likely increase, particularly from the nonagricultural financial institutions, as the services required by farmers more closely resemble that of firms in the nonagricultural sector (Duncan, Cole, and Crane, 1993a; Duncan, Cole, and Taylor, 1993). This may lead to a down scaling of agricultural-specific lending institutions.

Vendor financing has become another increasingly important element in agricultural finance. Suppliers of agricultural equipment have recently increased providing credit for their customers (Sherrick and Lubben, 1993). Although this activity is still relatively unregulated, it increases competition among lenders which presumably will benefit farmers. Advantages may also arise for
suppliers since they have better information regarding the technological properties and implied profit potential of farmer operations. Simply put, an agricultural supplier is more equipped to assess the profitability of a given farm. This tends to offset the increased risk due to change in lending criteria.

Environmental Risk

The environmental policy debate over the use of pesticides and allocation of water has evolved largely in the last two decades, and future availability of both pesticides and water prove to be important issues for California agriculture. Although the trend leans clearly toward decreased availability of both inputs, uncertainty over the actual outcome of the policy debate contributes to the perceived long-run risk in agriculture. However, environment-related risk does not affect all farmers uniformly. For example, farmers with senior water rights, an abundance of groundwater, or riparian rights will less likely suffer from any redistribution of water, and consequently, they face less risk. The response of different water districts' water usage patterns to the drought reflected this. Those that held more junior water rights (e.g., the Broadview water district) and grew high-value perennial crops responded to water conservation more rapidly than those with senior rights and annual crops (MacDougall et. al., 1992). Similarly, farmers growing crops with a low requirement for pesticides (e.g. cereal crops), organic farmers, and wine growers will be relatively unaffected by the outcome of the pesticides debate.

In terms of assessing the risk in California agriculture, some widespread misconceptions exist. These misconceptions arise due to a failure to take a complete, coherent view of factors at work in shaping the agricultural risk environment. Many believe that the recent drought unduly harmed California agriculture though the sector did not show any financial effects until as late as 1991, five years into the drought (MacDougall et. al. 1992). Much of California agriculture relies on stored water, and due to the large water inventories in California, four seasons of consecutive drought minimally impacted crop
production and the financial well-being of farmers.

There clearly exists uncertainty over future water allocations in California. However, this uncertainty will not necessarily translate into an unfavorable outcome for agriculture. For example, if the implementation of some form of water market occurs, farmers could, in fact, emerge better off than they are now. In essence, farmers in a position to sell water would be the beneficiaries of a windfall gain, and even if they do not sell, the value of the water would be capitalized into the value of their land. Thus, although the uncertainty surrounding this issue now contributes to the perception of agricultural risk, it does not necessarily follow that agriculture will be adversely affected by the outcome of the water policy debate. In fact, some farmers may greatly benefit. One must examine the entire range of plausible outcomes in order to determine whether a component of current risk will adversely impact agriculture.

Most recently, an agreement has been reached between environmentalists and the federal government (specifically, between the U. S. Department of Interior and the Natural Resources Defense Council) paving the way for the enforcement of the 960-acre limit on farm size for federal project water eligibility (Carlson, 1993). The Bureau of Reclamation has been directed to develop a new set of regulations governing eligibility for federal water and to submit an environmental impact statement regarding the effects of federal water projects by 1995. This development directly affects the uncertainty faced by large and corporate farms. Enforcement of this or similar rules would have far-reaching consequences for California farmers and the state economy, as fragmentation of corporate farms may lead to loss of economies of scale and thus higher food prices. In the short run, possibilities for entry and expansion in agriculture may increase as the sale of large quantities of land will drive land prices down. Small farmers would also benefit from becoming relatively more competitive as the large farms lose the cost advantages that come with size. Farmers who oppose the change argue that farmers have been forced into sharing arrangements, which effectively turn several small farms into one, minimizing the high costs and risks.
associated with farming. Again, the risk implications of this policy change depend on the type of farm under consideration.

VII. Conclusions

One's assessment of changes in the risk environment over time depends critically on the measurement of risk. Often we do not give enough attention to this fundamental issue. We identify the probability of disaster, appropriately defined, as being a major determinant to farmers perceptions of the risk environment. We identify changes in credit policies as a major source of new risk for California agriculture and observe that the implied changes are consistent with an increase in risk as defined above.

Evidence suggests that traditional sources of risk (i.e. price and yield risk) have not changed much over time, however, these sources still remain most significant to farmers. This indicates that, at least from the perspective of farmers, the current risk environment does not differ significantly from the past risk environment. We have identified changes in the credit rationing criteria as the most important contributing factor to any change in the risk environment. Less profitable farmers are less likely to obtain credit, an important instrument for cushioning against financial hardship, while all farmers may be susceptible to being refused credit due to informational asymmetries. The rate of farm failure provides a reasonable measure of the effect of changes in the credit criteria on agricultural risk. These data show that failures have been decreasing in an absolute sense and also relative to the non-farm sector.

We also stress the importance of accounting for intersectoral linkages in assessing risk. Failing to take account of the "full picture" can result in flawed inferences about the risk environment. In this respect, accounting for policy risk is most difficult since the range of possible outcomes is not always well defined. For example, will water markets accompany water reforms or not?
An interesting question arises from the results of Blank and McDonald (1993) who show that, while farmers rank the importance of credit and policy risk low, cooperative managers do not. The explanation for this apparent paradox may be political: People more closely involved with the political process may be more aware of the effects of potential policy changes and furthermore recognize the strategic importance of responding to questions in an opportunistic way. It might be fair to conclude then that the real importance of credit and policy risks lies somewhere between the response of managers and farmers.

References


Panel #3 Response

Eric Juline
Price Waterhouse

Risk can be managed, and I'd like to discuss some of the tools that are available for both farmers and lenders to utilize in the process.

Changes in the credit rationing criteria have been identified as one of the most important contributing factors to change in the risk environment. It isn't so much an issue of availability of credit, or cost of credit, but the information process. Information is the very foundation of the credit rationing criteria.

Numbers are like a second language. For some, it's a foreign language, but it's vital in today's complex world. A lot of information is flowing from farmers to lenders and vice versa. The issue is primarily the quality, not the quantity, of information being exchanged.

There is great variability among farmers. The first variable is what type of numbers, what type of information is accumulated. The second is the ability of those farmers to assimilate that information, to understand the data that they are accumulating. Next, is their ability to articulate that information, to communicate it to the lender, and build a relationship of trust and credibility. There's a further variable in the willingness of farmers to disseminate that information, from a confidentiality perspective as well as concern that there might be income tax ramifications. Because of this high degree of variability, the information development and communication process is a risk area which certainly warrants a farmer's attention.

On the lender's side, we need to address the willingness of those lenders to ask for the information. I know that there is continued disinclination to ask for it. Furthermore, there's the ability of the lenders to comprehend the information that they receive. And finally, there's the degree to which they trust that information and are willing to act upon it in making their credit decisions.
Similar to the farmer side, there is variability in the information requirements and communication process.

Historically, agricultural lending has been compartmentalized, or departmentalized—only ag lenders did ag lending. This situation existed in all of the situations I’m aware of—the Farm Credit System and commercial banks being two prime examples.

Agricultural lending was not institutionalized, either—there was no Farmer Mac. I think the institutionalizing of lending—such as through the GNMA, FNMA, and other types of programs that have existed in financial institutions—has advanced the credit analysis process.

Let’s talk about the future. I certainly think it’s in the best interest of both the lenders and the farmers that the credit rationing process becomes more accurate. Dr. Zilberman mentioned that a lot of grief could have been avoided on both sides during the 1980s if the credit granting process had been more accurate than it was.

My recommendations to improve the development and communication of information focus on putting more emphasis on performance-based measures. First, there’s the ability to repay. Cash flow is a critical element in assessing the credit rationing process.

I’d like to add the further component of profitability, because cash flow can come from a number of sources—not only profits. It can come from asset liquidation, and that’s not necessarily a source that will be reliable over time.

I think we should focus both on cash flows and profitability. I have a strong bias regarding measurement of profitability. My recommendation to farmers is that they adopt full accrual basis accounting principles. It is complicated in application, but it is the only effective way in which you’ll really be able to fully understand your profit potential as well as cash flow. I think farmers should take responsibility for really developing an understanding of their information and the ability to effectively articulate it, in written form as well as orally in their discussions with their lenders.

Finally, I think farmers should be more receptive to the wider range of benefits that evolve from more sophisticated accounting standards. There’s a long list of those
benefits, and I think you will realize rewards much beyond whatever costs you might incur.

With regard to lenders, I believe you should more often comply with the standards that you have adopted for yourselves. I know that they are applied to a great extent, but I'm convinced that they're not fully applied across the board. You should also apply the same standards that you utilize for commercial lending—bring all of those qualities and standards over to the ag lending arena. I think lenders should become more knowledgeable in utilizing the information that is provided. It's a mistake to ask for a financial statement and not describe what you mean when you request it. You might get a financial statement prepared on a tax accounting basis or a cash basis. What you should be asking for, in my view, is a financial statement in accordance with generally accepted accounting principles—accrual-basis accounting. It's important to understand those distinctions when you are asking for information so you get information that is not only going to be valuable to you, but also valuable to the farmers who are communicating with you. Lenders should also become more informed and willing to communicate the wider range of benefits that evolve from higher credit-granting standards.

Essentially, I think risk in the credit granting process can be reduced—and reduced significantly. Farmers can improve their ability to repay and improve their profit performance, and lenders can improve their ability to identify farmers who are more likely to repay their loans.

René Atwater
AIG Consultants

I want to draw a correlation between what I see as the lender’s concerns in lending on agricultural properties and some of those same concerns from the insurance perspective.

The risks we’re concerned with from an environmental perspective deal with three issues. There has to be a contaminant, a source; a pathway—either soil, groundwater, surface water, or air; and a receptor. When we talk about a receptor, we consider what sort of impact there
might be on public health.

From the environmental side, we really don't deal much with production risk, in terms of impacting output. But the input-price risk—those costs associated with running the farm—certainly do come into play with regard to environmental issues. Both the assessment and certainly the correction of environmental impacts play a big role. Of course, those are also of concern to the lender when making a loan on a piece of property—not knowing for sure whether or not in a foreclosure you might become the owner of that piece of property.

In the environmental arena, we hope that changing over to new technology will have a bigger role. One of the good things that has come about through the push of increased environmental regulation and correction is that the technology for doing something about these problems has certainly increased. We hope to see more advances.

In assessing agricultural risk, there is a very large premium associated with the uncertainty of outcome. We insure to cover the uncertainty of that outcome. More and more we are seeing both farmers and lenders depending upon the other being named as the additionally insured or leaning on an insurance policy for a bit more of the financial wherewithal, should there be a failure as a result of an environmental impairment.

There is always risk variance. I'd like to draw your attention again to the source, the pathway, and the receptor. Any one of those can be either heavily or slightly impacted, and certainly, the risk varies a great deal depending on that.

I want to go through a few things with regard to dangers directly associated with the farmer. The Comprehensive Environmental Response Compensation Liability Act of 1980 (CERCLA)—otherwise known as the Superfund—was the first element to place liability for the cost of environmental clean up on the landowner. As an owner or an operator, a tenant, or even a contract grower, the farmer is a potential responsible party, or what we call a PRP, and can be liable. The liability is absolute. Fault is not material to the liability for the cost of cleaning up the property.

Further exacerbating the problems are regulations
such as Proposition 65. There has not been a lot of litigation, but certainly that penal law applying to persons with more than 10 employees who contaminate the water supply in the course of doing business could create financial problems associated with clean up. Chemical residues in irrigation return flows and cleaning of farm equipment can all come into play, and certainly the posting requirements associated with Proposition 65 are far-reaching.

The other provision in Proposition 65 that you may not be aware of is the bounty hunter provision. That can be 25 percent of the $2,500 per day penalty per violation. This allows for people who don’t have anything to do with the farm reporting things that they think may have an impact on public health, and thereby potentially setting the farmer up for violation penalties.

The tort, or personal injury liability, seems to be the biggest risk for the agricultural industry from what we’ve seen. This usually involves groundwater contamination resulting from negligent handling of chemicals or the creation of a nuisance. The chemical manufacturing industries have started to take a much more rigorous approach to putting together their instructions. Everything comes with a material safety data sheet now, so that every manufacturer can be covered—whether or not it’s considered to be a hazardous material or a hazardous chemical. This makes our job cumbersome as well, because we have to go through quite a number of these material safety data sheets to decide what, in fact, exists on the farm that we might need to deal with.

I also want to cover some of the dangers to lenders. Certainly I think the perspective of the insurance company is in alignment with the concerns of the lender. Cost for clean up under CERCLA as a PRP is one of the larger concerns. The lender becomes an owner through foreclosure, or an operator by being deemed manager of the business.

David Muller
Diversified Farmer

Farmers are comfortable with risk. They have no trouble planting and contracting for early peaches or late-
harvested tomatoes. They're willing to take the gamble, and they'll quantify it. Offsetting preventive sprays against possible reduction in grade or higher cull-out—they can understand that and adapt to it.

Most of the exposure to a lender is in the uncertainties that threaten us—including the government. As an example, we grew boysenberries and we had eight agencies on our 40 acres when we started picking one year. We got into a ruckus, believe it or not, on toilet seats. One agency said you must have toilet seats to keep the flies down. Another agency said you can't have them because they carry disease. Both of them said they were going to shut us down, but then they left, and we never saw either of them again. This is a Mickey Mouse example, but it's been repeated as we've tried to get underground tanks off the place.

Another problem is hiring practices—government enforcement of the threatened fines for hiring illegal immigrants. I've hired illegals, but I don't know which ones they were as long as we didn't have a definitive identity card. I'm told that for $75 in Delano, you can get a driver's license, a credit card, a green card, and a social security number. The risk on that is just incomprehensible. After the threats of $10,000 fines, my wife told me that planting more berries would be regarded as grounds for divorce. And so we're moving to almonds. I'd rather take my beating, take my risk at bloom or frost rather than have it either up or down—instead of being slowly hemorrhaged over the year.

The real uncertainties and the real action come into the relationships with financing. Commercial banks have shifted for size. The co-op banks have made it difficult for some of their members as their goals have shifted from serving the agricultural community to matching the financial criteria of commercial banks. There's a hardship there. Maybe it's necessary from a government standpoint, but it's going to be tough.

The marketing of your product is the major risk and that's where we've been beat up time and again. I have several examples involving boysenberries, beans, and milk where the company we sold our products to was bought out, and we lost our market.
The concern that I have about marketing is also the morality part of it. If this makes me sound like an old timer, then I guess I qualify, but more and more if there's no performance, then the reaction is, "So, sue me." I'm not going to do that. I can't afford to do that. I think that should be a concern for lenders as well as the borrowers.

The premise of the paper is that risk is declining, and I would say that's probably so, but I would qualify that the reward—the premium—for accepting risk is going down along with it.

I would say the risk-reward ratio is the same as it was before—on a lower level. We play a lot of games at budget time. We play a lot of "what ifs" with price swings. Frost at bloom, what happens if...? Can we handle it? Can we convince our loan officer that we can handle it? Can we tell him that we will borrow a dollar and pay back a dollar and a dime? That's a challenge, and we accept it happily.

Palma Risler
U.S. Environmental Protection Agency

About six months ago, I started to look into the issues because people were telling us how production would be affected if water supplies available to Central Valley agriculture were more limited. I asked about agricultural financing because if there's going to be less water, growers will want to improve their technology and maybe do some crop shifting—which takes some financing. The off-the-shelf academic answer was that agriculture is in a great position; there's no big credit crunch. However, the farmers told me that the banks were very concerned about their water supplies, due to the drought. Then they would express fear that if environmental needs were increased, the banks would be a barrier to them improving their technology and becoming more sustainable in water use. I started worrying because I wanted to be accurate in informing my managers and the decision-makers in government as to what the economic impacts would be.

My question is, what will be the role of finance in assisting agriculture in the transition to reduced water supplies? I'm not sure reduced water supplies will be an
issue of risk because of what we’re planning. Let me explain.

On December 15, there was a joint federal proposal of Clean Water Act standards for the San Francisco Bay-Delta and a couple of Endangered Species Act designations for fish that live in the Bay-Delta. Our proposal is to determine the ecological needs of the San Francisco Bay-Delta. It’s an ecosystem approach. By protecting the ecosystem, we hope to protect all the species within it. Now that’s good news. Under the Endangered Species Act, each species could come in with different biological needs. What we’re attempting to do is to come up with one proposal that could protect all species. What that will mean in practice is that water supply needs for the various species will overlap, because they all need water essentially at the same time.

Hopefully, we can turn a lot of this fear and uncertainty as to how much water is needed for the environment—and thus how much the supply would be reduced for other water uses, including urban—into a clear picture that we can discuss.

First, I’d like to identify what I think the problem really is. I don’t believe, after some of our analyses, that the issue is the total amount of water. The current estimates—and we’ve been working with the Department of Water Resources—are that our standards would result in a water supply need for the Bay-Delta of about 500,000 acre-feet a year. Now that’s a lot of water, but about 16 million acre-feet are diverted from the Bay-Delta. That comes out about four percent, so I don’t think it’s the total amount of water that’s in question. The real issue is how the responsibility is distributed in terms of the certainty or the uncertainty. What the banks were reacting to in the drought, and what we hope they won’t be reacting to when people meet their environmental responsibilities, is how that amount of water is distributed among users.

The state board has said many times that everyone who diverts has a responsibility to meet public trust requirements, and the federal government is interested in going with that pro-rata share. In the drought, junior water rights holders got hit first.
So I think the issue is not how much water—because we're not talking about a great deal of additional water being put into the San Francisco Bay-Delta—but how the impact is distributed among different people and, again, how the banks would react. If there's some magic number so a grower can't get loans if his water supply is axed, I'm not sure we yet know what that number is. That's the issue.

Another thing is the water market. How is that working to make people more flexible in terms of getting water supplies? How are banks reacting to that, and how are farmers reacting? I know that farmers want to get into the market as their water supplies are possibly reduced. They did during the drought, but sometimes we hear that banks are very positive about the water market and sometimes, they are not.

I'd also like to talk about another area of finance—the issue of irrigation efficiency and technology adoption. I've seen increased interest by irrigation districts in assisting technology adoption for water-use efficiency. They have been very innovative, especially on the West Side of the San Joaquin Valley, where irrigation districts got loans from the State Revolving Fund, which is an environmental source of loans. They borrowed millions of dollars to get tailwater return systems, or to buy sprinklers for pre-irrigation. The State Revolving Fund was originally used for sewage treatment plants, and it's a source of low-interest loans. We're thinking there will be an increased need for mechanisms like that.
Epilogue: Putting the Pieces Together

Steven C. Blank

After weighing all the evidence presented in this book regarding whether or not there is a credit crunch and what are the future prospects for agricultural credit in California and the country, a few conclusions can be reached. In general, it appears that "where you stand on this issue depends on where you sit." If you sit on a tractor and depend on borrowing to finance your production, you most likely believe that a credit crunch is still quite evident in agriculture. If you sit behind the loan desk at almost any lending institution, you probably believe that if there ever was a credit crunch, it is over now. Finally, if you sit in the hot seat of an agribusiness manager, your attitude probably falls somewhere between these two opinions. By presenting all sides of this issue, this book is intended to help resolve some of the points of dispute. Therefore, an assessment of the project's major research findings follows.

To begin, there is ample evidence that agricultural producers are currently experiencing more difficulty in gaining access to the credit they desire than was the case a decade ago. Articles in the popular press and publications aimed at producers and at lenders have appeared
with some frequency over the past three years citing some case studies or circumstances in which credit has been tightened (for example, see Western Grower & Shipper and Brunoehler). Many producers attending any of the workshops in the University of California’s series on agricultural credit held across the state during 1992-93 said they had to shift from one lender to another in search of credit. Producers often noted that their lender imposed new constraints on their credit line despite not having ever defaulted on previous loans. This story also appeared in the interview data reported in this book. Ninety-five percent of the cooperatives contacted reported that some of their members had faced tighter lending requirements, and nearly half said members’ operations had been curtailed to some degree by credit limitations. Therefore, credit conditions are clearly influencing producers of all types of agricultural products across the entire state.

Agribusiness firms have not felt the same degree of change in credit availability as have individual producers, thus firms do not often complain of a credit crunch. About 30 percent of cooperatives interviewed for this study said that borrowing requirements had become more difficult to meet, but only 12 percent of those firms felt that their operations had been constrained by credit conditions.

Many lenders said that the “crunch” has not been in credit but in agricultural profits. “There is no credit gap for creditworthy borrowers,” Michael Grove, chairman of the American Bankers Association’s Agricultural Bankers Division, testified in 1991 before the House Subcommittee on Conservation, Credit, and Rural Development. A creditworthy borrower, Grove said, is one “who has the ability to service debt, based on past performance and projected future profitability.” This viewpoint was repeated often in interviews conducted during this study. Lenders said that money is available to the agricultural sector, but that loan officers must be increasingly careful about assessing the profitability of individual agricultural borrowers.

Banks continue to change their credit evaluation process and tighten their credit standards. The farm financial crisis of the mid-1980s and the savings and loan
crisis both demonstrated the risks to lenders of holding predominantly real estate loan portfolios. This realization resulted in a shift from the common practice of lending on equity to the new emphasis on lending on income. Lenders no longer want to risk foreclosing on a property and selling it because real estate markets now decline more often than in the past. Thus, the focus of credit analysis has shifted from a borrower’s balance sheet to his income and cash flow statements for the most recent three to five years and for the future period covering the requested loan. In California, this shift in lender focus came at a bad time for borrowers, as noted below.

Lenders consider agriculture to be riskier than some other sectors of the economy—a view which has been reinforced by two trends. First, weather patterns have been relatively variable. The recent six-year drought in California made incomes of agricultural producers more volatile. Water availability, in particular, has become more important to lenders when evaluating a potential borrower’s income prospects. Some California lenders have added a water availability questionnaire to the required loan application package for agricultural borrowers. A number of cases have been reported in which credit was not extended, or was reduced, to borrowers with limits on their water sources. California’s irrigated farms used to be considered somewhat safer than rain-dependent operations in other parts of the country, but now that water supplies are less certain it is necessary to recognize the resulting increased risk. Also, California producers continue to shift more acreage into high-value, high-risk crops while reducing total acreage, thus making the state’s “portfolio” of crops more risky, on average, and requiring a higher investment per acre.

The second trend impacting lenders’ view of agriculture is the increase in non-agricultural sources of uncertainty which affect agricultural producers. The recent tightening of regulations on the part of bank examiners and the ever-tighter regulation of the environment are examples of new sources of uncertainty. These and other sources of risk have widened the range of possible returns for agricultural operations, forcing lenders to factor new scenarios into their risk assessments, resulting in higher
average estimates of risk for the agricultural sector.

When communicated by lenders to borrowers, this upward assessment of risks in agriculture has direct and indirect effects on agricultural production levels and cropping patterns which, in turn, may exacerbate the "credit crunch" being felt by parts of the state's agricultural sector. As shown in this study, producers react to a perceived increase in risk by shifting some of their acreage first into more risky, high-value crops and, as markets adjust in the long-run, into lower risk crops. The net effect of these changes is a reduction in agricultural profitability. Reduced profits of borrowers make lenders even more reluctant to extend credit. Also, lower expected profits per acre reduce land values and the equity base of borrowers. Thus, there are increased incentives to take land out of agriculture for some other use.

The new risk environment will raise the demand for risk management tools. As lenders pay increasing attention to risks faced by borrowers, those borrowers will begin to pay increased attention to risk as well (Knight et al.), either by choice or by necessity. This study reports on current levels of use for a number of risk management tools, noting that both producers and lenders commented during interviews that risk is becoming a more important part of the lending process. Agricultural producers only occasionally report that risk plans are required by their lenders at present, but the trend is toward more formal business (and risk) plans becoming a standard part of loan applications.

The risk management tools available to producers in California are limited in number and effectiveness. Tools for price and yield risks, such as futures and options markets and crop insurance, are not available for most of the state's major commodities and are often ineffective for the markets which are covered. Yet, producers are interested in using more tools if the weaknesses can be reduced (Blank and McDonald). However, information and education programs will be needed to significantly raise the level of awareness and use concerning risk management tools. Such programs will most likely need to be targeted at both producers and lenders.

Another complication in the agricultural credit story
is the continued segmentation of the market. As economic cycles change the relative profitability of the various sectors in the state's economy, lenders such as large commercial banks and insurance companies respond by adjusting their level of activities in each sector. This, in part, has led to the significant difference between average loan sizes found in the interview data reported in this book. Large banks and insurance companies averaged about $1.1 million per agricultural loan, compared to less than $400,000 for all other types of lenders. Many loan officers at large banks noted that agricultural borrowers must compete for credit with borrowers from all other economic sectors, with the most profitable prospects getting the money. The implication of this market trend is that smaller loans (to any type of borrower) will be dropped by lenders in favor of larger loans which generate more profit for the same amount of the lender's servicing time. Agricultural loans more often tend to be "small," just like in the retail sector, so they will often be the marginal cases in some lenders' portfolios. In recent years economic circumstances created the market segmentation noted above, leading to an important observation made by one participant at the UC's credit workshops. That person, a farmer in the Fresno area, pointed out that agricultural producers wanting to borrow $300,000 or less always have (subsidized) sources of funds available to them and someone wanting to borrow over $1 million has to beat prospective lenders off with a stick, but for the majority of producers who fall between those borrowing levels, the number of sources of credit has gotten smaller. In some isolated agricultural regions this can be a significant problem. Although the economic rationale for this market segmentation is clear to lenders, it is seldom communicated to borrowers.

Finally, government has not helped California's agricultural producers handle the new credit and risk environment. Although producers viewed government action as a way to smooth agricultural income variability in the past, they now focus on the risk associated with government programs. Some policy changes, such as those affecting the environment and credit supply, have significantly impacted California agriculture's income
variability and asset values.

In summary, the research reported in this book leads to at least four key points:

- Changes in the perception of risk are altering production and cropping patterns which influences the demand for credit.

- What borrowers consider a "credit crunch" in agriculture is actually change in the loan process and loan analysis rather than change in the general availability or cost of funds.

- Traditional agricultural risks have actually declined, but other sources of uncertainty are growing, particularly regarding environmental regulations and government policies.

- Policy and government programs have come to be viewed more as a source of risk rather than a source of security in agriculture; however, government can provide objective information and analysis useful to both suppliers and users of credit.

It appears that economic, policy and regulatory changes have triggered a change in the rules of the agricultural lending game. Currently, the rules continue to change and both lenders and borrowers must constantly adjust to the fluid situation. Until this period of uncertainty regarding the external (political) factors influencing agriculture and the lending industry ends and the situation stabilizes for a period of time, borrowers and lenders may be unable to resolve any differences which exist between them. Although the data collected during this study indicates that no substantial shift has occurred in the historical partnership between agriculture and its lenders, the perception that such a shift took place is held by many borrowers. To eliminate this potential for conflict, borrowers and lenders need to maintain ever stronger lines of communication. The historical link provided by the lenders’ field staffs who worked closely with agricultural borrowers has been eroded away by the need for cost cutting to maintain the economic health of the lenders themselves. Without that type of communication link, learning the new rules of the game will be difficult for borrowers and lenders, but not impossible. The new risk environment is leading to many changes,
although none that cannot be overcome. Both agricultural producers and lenders responded to questions about the future of California agriculture with optimism, thus there is every reason to believe that their profitable partnership will continue.

References


Biographies

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