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could increase their net returns and/or reduce their risk (Shapiro and Brorsen). Farmer's use of leveraging (and the resulting debt payment obligations) is closely related to liquidity management, the topic of the next section.

Liquidity

Another aspect of financial risk management is liquidity, which involves the farmer's ability to generate cash quickly and efficiently in order to meet his or her financial obligations (Barry and Baker). The liquidity issue relates to cash flow and addresses the question: "When adverse events occur, does a farmer have assets (or other monetary sources) that can easily be converted to cash to meet his or her financial demands?"

Asset liquidity depends on the relationship between the firm's assets and the expected cash proceeds from the sale of each of those assets (Barry, Baker, and Sanint). An asset is perfectly liquid if its sale generates cash equal to, or greater than, the reduction in the value of the firm due to the sale. Illiquid assets, in contrast, cannot be quickly sold without a producer's accepting a discount, reducing the value accruing to the firm by more than the expected sale price. Examples of liquid assets include grain in storage, cash, and company stock holdings, while illiquid assets include land, machinery, and other fixed assets. Factors that influence liquidity include marketability of the asset, the length of time allowed for liquidation before the cash is needed, transactions costs, and the asset's income-generating role in the firm (Barry, Baker, and Sanint; Pierce).

Liquidity management is interrelated with risk responses in production and marketing, and also with the farm's degree of leverage. The more highly leveraged the farm, everything else being equal,

the greater the need for careful liquidity management in order to make timely payments on loans and other farm financial obligations. Some of the methods that farmers use to manage liquidity, and hence their financial risk, include the following:

- *Selling Assets*—A producer's willingness to sell assets is an important financial response to risk, particularly in crisis situations (Barry and Baker). If a farmer faces a low net income in a given year, selling liquid assets (such as stored grain or nonfarm assets, such as stocks) is a first step in meeting expenses for the year. Holding liquid assets, however, may be costly because they typically earn lower returns than when used in the production process (assuming the economic viability of the operation). If the use of liquid assets is not adequate to meet financial demands, additional steps—such as the sale of less liquid assets—may be necessary. Because many farmers are heavily invested in illiquid assets, such as land, livestock, and machinery, maintaining liquidity to meet shortfalls in returns may at times be difficult.
- *Managing the Pacing of Investments and Withdrawals*—Maintaining flexibility in the timing of farm investments and withdrawals is also a response to financial risk. In low income periods, for example, a producer may postpone the purchase of new machines and other equipment. This is an approach favored by many producers during times of adversity. It avoids large financial outlays during such periods, builds equity, reduces indebtedness, and allows the strengthening of profitability in a rapidly expanding farm operation (Barry and Baker).

- *Holding Liquid Credit Reserves*—Producers commonly maintain liquid credit reserves to manage their financial risk. Credit reserves reflect unused borrowing capacity, and generally reflect additional capital from lenders in the form of an open line of credit. Maintaining credit reserves avoids the costs associated with liquidating assets to meet cash demands, and the possible later reacquisition of those assets when the adversity has passed (Barry and Baker). In addition, drawing from credit reserves when needed does not disrupt the farm's asset structure, the transactions costs are typically low, and institutional sources of funds are generally available to producers in rural areas (Barry, Baker, and Sanint). Several implicit costs are, however, associated with such reserves. For example, they represent an opportunity cost from forgone leveraging. Further, interest must be paid on new loans, and noninterest charges (such as loan fees) are at times used by lenders to compensate for establishing lines of credit (Barry, Baker, and Sanint).

Farmers' reliance on the last strategy listed above—accessing credit reserves to obtain liquidity during times of adversity—introduces risk in terms of lenders' responses. Lenders' decisions regarding the availability of credit are directly

affected by a farm's capital structure (the degree to which the farm is leveraged), conditions in the agricultural sector (such as the level of market prices), and financial market conditions (such as interest rates) (Barry, Baker, and Sanint).

Partly due to significant loan losses in the 1980's, agricultural lenders increasingly have emphasized credit quality and management of credit risk in their loan portfolios. Both price responses (risk-adjusted interest rates) and nonprice responses (differential loan limits, security requirements, or loan supervision requirements) may be employed to address credit risk (Miller, Ellinger, Barry, and Lajili). In a 1992 survey of more than 1,000 banks in Illinois, Indiana, and Iowa, respondents indicated that they were quite able to distinguish between high- and low-risk borrowers, and to monitor their performance. Of the respondents, 70 percent indicated that they differentially priced loans to finance farm production, and 59 percent differentially priced loans secured by farm real estate. A smaller percentage of respondents indicated the use of risk-adjusted interest rates on loans (table 15).¹⁶

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¹⁶Commercial banks may use differential rates for other reasons than credit risk. Complexity of pricing, a bank's capital position, bank size, and risk-distinguishing ability generally are associated with the use of differential and risk-adjusted pricing (Miller, Ellinger, Barry, and Lajili).

Table 15—Selected price and nonprice responses of respondent banks in Illinois, Indiana, and Iowa, 1992

Price and nonprice response	Indication of use
	Percent
Differential loan pricing on loans to finance agricultural production	70
Differential loan pricing on loans secured by farm real estate	59
Risk-adjusted loan pricing on loans to finance agricultural production	57
Risk-adjusted loan pricing on loans secured by farm real estate	40
Charging of fees on agricultural loans	43

Source: Excerpted by ERS from Miller, Lynn H., Paul N. Ellinger, Peter J. Barry, and Kaouthar Lajili, "Price and Nonprice Management of Agricultural Credit Risk," *Agricultural Finance Review* 53 (1993): 28-41

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In addition, lenders may require that producers use one or more risk management strategies to increase the likelihood of timely payments on financial obligations. Indeed, lenders' recommendations can have an important influence on producers' risk management decisions. A survey of Texas lenders and producers in the late 1980's, for example, indicated that the use of risk management practices—including hedging, forward contracting, crop insurance, farm program participation, and diversification—resulted in lenders viewing loan requests more favorably (Knight, Lovell, Rister, and Coble). Using a logit model, this research also found that lenders can greatly increase the probability of their borrowers adopting certain risk management practices if the use of those practices is recommended by the lender.

Regardless of lender recommendations, empirical research provides evidence of the effectiveness of such risk management strategies. As discussed earlier, studies show that the use of hedging or options reduces financial risk and improves cash flow, potentially lowering a farmer's credit risk (Turvey and Baker, 1989). Because of this risk reduction, high-debt producers with low credit reserves would be expected to hedge more than low-debt producers with large credit reserves (Turvey and Baker, 1990). Turvey and Baker's results support the notion that lenders will benefit from producers' hedging (and presumably, their use of other risk management strategies) because it decreases portfolio riskiness (Heifner, 1972a).

Leasing Inputs and Hiring Custom Work

Producers can also manage their farming risks by either leasing inputs (including land) or hiring workers during harvest or other

peak months. Leasing refers to a capital transfer agreement that provides the renter (the actual operator) with control over assets owned by someone else for a given period, using a mutually agreed-upon rental arrangement (Perry, 1997). Farmers can lease land, machinery, equipment, or livestock.

Leasing has similarities with leveraging (a topic discussed previously in this section), in that both are methods used to expand control over resources. In addition, both commit the farmer to regular payments. Leasing appears, however, to have some advantages. One advantage is that control can be gained over long-life inputs (such as land and machinery), without making long-term payment commitments. In addition, leasing provides producers with flexibility in allocating their asset portfolios—a producer can be in either the farming business or the land ownership business, without being in both.

Leasing has potential advantages to those who are renting. Leasing improves the renter's flexibility to respond to changing market conditions. In addition, leasing reduces the long-term fixed payments on borrowed capital that may strain liquidity in years of reduced output, and can reduce both financial and production risk for the renter (Sommer and others, 1998). In essence, leasing limits fixed costs, providing greater flexibility for the renter to adapt. It also offers a way to enter farming or to manage the size of the operation without requiring large investments of capital. One disadvantage, however, is that renting may limit the short-term borrowing capacity of an operation because of the absence of collateral to back a loan (Sommer and others, 1998).

Advantages may further accrue from the perspective of the owner. Leasing allows the owner of the