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FARM RISKS FROM INSTABILITY IN FINANCIAL MARKETS

Emanuel Melichar

When risks in farming are studied, physical and product market risks deservedly receive the most attention. Recently, however, risks of adverse changes in farm input markets have become more prominent. And among these, the risks originating in financial markets--manifested as unanticipated adverse changes in the cost and availability of farm loans--are becoming more important. In part, their larger role is a result of increased reliance by farmers on external financing of farm capital formation and land transfers, which has led to a sharp rise in debt/income ratios (Melichar, 1977a, 1977b, 1978c). Contributing factors, however, have been an increasing instability of the financial environment itself and a gradual reduction in the degree to which rural banks are insulated from that environment. These are the sources of increasing farm risk addressed by this paper. Risks originating in financial markets need to be better perceived and understood by farmers and analysts, to permit appropriate recognition in farm financial decision-making and in farm firm growth models.

Instability in Financial Markets

Over the past 25 years, the nation's financial environment has exhibited increasing instability. This period was marked by five episodes of financial disruption--in 1955-57, 1959-60, 1966, 1969-70, and 1973-74. These credit crunches have become successively more severe, as judged, for instance, by the relative rise in the cost of short-term credit and by the number and prominence of the firms and financial institutions experiencing visible (publicized) financial stress.

The Nature of Financial Instability

Allen Sinai, a prominent analyst of financial behavior, has defined a credit crunch as "a credit crisis stemming from the collision of an expanding economy with a financial system that does not provide enough liquidity" (Sinai, 1976). Underlying this phenomenon is financial instability, which he regards as "an endogenous process, rooted in the cyclical evolution of risky balance sheet positions for various decision-making units" (Sinai, 1977). Hyman Minsky, who has provided vivid descriptions of this process, notes that the financial position of indebted firms can be categorized by the relationship between their cash flow and their debt service requirements (Minsky, 1977).

At some firms, cash flow exceeds scheduled interest and principal repayments. Thus refinancing (rollover) of the debt is not required, and exposure to risk from an unstable financial environment is minimal. A majority of small farms have no or relatively low debt and thus fall into this category of firms for which financial market risks are largely irrelevant.

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At most other firms, cash flow covers interest payments but not all of principal repayments. Thus refinancing (rollover) of some or all of the debt either was part of the original financing plan, or the need for it has arisen through unexpected shortfalls in cash flow. Firms in this situation are exposed to the risk of encountering adverse conditions in financial markets at the time that refinancing is required. Most of the larger farm firms fall somewhere in the spectrum of such "speculative finance," with planned rollover of production debt and often either planned or unplanned rollover of some intermediate-term and long-term debt as well.

Finally, at some firms cash flow does not cover interest payments, and debt must be continually increased (or assets sold) if the firm is to survive. Obviously, such firms are highly vulnerable to changes in the cost and availability of additional debt. Minsky notes, however, that even firms in this position can be experiencing increasing net worth if the value of their assets is rising fast enough--as it would have been at most farm firms in recent years.

During the expansionary phase of a business cycle, firms tend to move into more speculative financial positions which may later expose them to cash flow problems (Kaufman, 1977; Minsky, 1972). Suppose, for instance, that business conditions are improving after a previous cyclical trough. Firms see that their earlier plans to increase production and sales are succeeding, and they become willing to increase financial leverage to undertake further expansion. In view of the favorable results being attained by their borrowers, lenders also become more confident and extend credit more aggressively, on more liberal terms. In short order, massive debt creation is underway. As various aggregate resource limits are approached, inflationary pressures arise or accelerate. At this point, it is likely that monetary and fiscal policy actions will be undertaken in an attempt to moderate the pace of expansion. When expansion slows, whether as a result of resource or policy constraints, cash flows at many firms begin to fall short of the expectations on which financing plans were based. New and strident credit demands arise from these threatened firms even as monetary policy actions may be restraining growth of the supply of loanable funds and as lenders are attempting to obtain nominal yields high enough to offset the effect of inflation on the real value of their monetary assets. Thus interest rates rise rapidly. In addition, as interest rates reach levels that borrowers and lenders perceive as abnormally high, borrowers tend to prefer short-term loans while lenders may want to lock in the high yields by making loans with longer maturities. Demand for short-term funds thus rises sharply relative to supply, and short-term interest rates are bid up above long-term rates on paper of the same quality. During this "credit crunch" period, some marginal firms are unable to obtain the additional financing they need to cope with their newly adverse cash flow position. The largest of these firms make the financial headlines, while smaller firms expire with less fanfare.

The Historical Record of Credit Crunches

After detailed empirical study, Sinai has concluded that since the mid-1950's there have been five financial crises of the "credit crunch" type, "characterized by extremely depressed liquidity positions for households, corporations, and financial institutions; sharply increased interest rates

as all sectors scramble for available funds; rising yield differentials as investors sell their most risky investments; and the inability of many borrowers to obtain funds at any price for certain expenditures" (Sinai, 1976). Among the empirical indicators of the development and culmination of a credit crunch, one that is both simple and readily available is the ratio between interest rates on short-term and long-term securities of similar quality. As noted in the scenario presented earlier, short-term rates rise faster than long-term rates as business cycle peaks are approached, and most likely exceed long-term rates if and when a credit crunch occurs.

Table 1 shows such a ratio calculated from published average market rates on securities issued by corporations with the highest credit rating. In each case, average short-term rates rose above long-term rates about 6 to 9 months prior to the onset of recession as dated in retrospect by the NBER, and thus by an even longer period before ongoing recognition that a recession had begun. These data suggest, therefore, that a credit crunch preceded each recent recession or significant slowdown in economic activity, beginning with the 1957 downturn.

It is reasonable to believe that the level reached by the ratio is indicative of the severity of the crunch. Thus the data in Table 1 also suggest that the relative severity of successive postwar financial crises has been increasing. As judged from this indicator, the severity and duration of the 1973-74 episode approached that of the crunch period which preceded the Great Depression. (The indication, in Table 1, that a severe credit crunch began in the spring of 1928 and continued through 1929 appears to deserve more study as a largely overlooked and potentially major cause of the onset of the depression, especially in the light of recent experience with the impact of such episodes.)

In recent months, another period of financial stress has been entered. Although numerous references to the advent of a new credit crunch appeared in the media in late 1977 and early 1978, or soon after interest rates began to rise, the record of the ratio of short-term to long-term corporate rates indicates that such appellations were far from applicable until late in 1978. So far, as measured by that ratio, the relative financial stringency has been less severe than that of the last two crunches, and more nearly resembles that of 1966, which was followed by an economic slowdown but not recession. Recent monthly-average values of the indicator are as follows:

1978--January	.81
February	.80
March	.80
April	.80
May	.82
June	.87
July	.89
August	.91
September	.97
October	1.02
November	1.13
December	1.14
1979--January	1.12
February	1.08

Table 1. Credit crunch episodes as indicated by an inverted yield curve on corporate business securities, 1925-1977

Months from cyclical peak	Cycle that peaked in--					
	November 1973	December 1969	October 1966*	April 1960	August 1957	August 1929
Ratio of interest rate on 4-6 month prime commercial paper to that on Moody's AAA long-term corporate bonds (monthly average)						
-18	.62	.99	.99	.79	.97	.90
-17	.64	.99	.99	.75	.97	.93
-16	.67	.98	.98	.82	.97	.98
-15	.67	.98	.98	.80	1.00	1.00
-14	.71	.95	.98	.79	1.04	1.04
-13	.74	.96	.97	.81	1.00	1.11
-12	.74	.96	.96	.81	.96	1.16
-11	.77	.99	.95	.82	.98	1.22
-10	.81	.99	.99	.86	1.01	1.19
-9	.86	1.00	1.02	.89	.98	1.18
-8	.94	1.02	1.02	.90	.97	1.17
-7	.98	1.08	1.06	1.02	.96	1.16
-6	1.00	1.18	1.08	1.04	.99	1.18
-5	1.08	1.22	1.08	1.02	.99	1.25
-4	1.23	1.20	1.09	1.07	.99	1.28
-3	1.33	1.19	1.09	1.06	.97	1.28
-2	1.34	1.17	1.10	1.02	.97	1.26
-1	1.17	1.15	1.07	1.00	.97	1.26
0 (peak)	1.17	1.14	1.11	.94	.97	1.28
+1	1.18	1.11	1.12	.95	.97	1.30
+2	1.11	1.08	1.11	.86	1.00	1.31
+3	1.00	1.06	1.10	.77	1.00	1.21
+4	1.05	1.03	1.07	.78	1.00	1.07
+5	1.19	1.02	1.02	.80	.97	1.05
+6	1.27	.97	.94	.77	.73	1.01
+7	1.29	.98	.89	.76	.64	.92
+8	1.34	.97	.86 T	.74	.53 T	.84
+9	1.29	.91	.88	.69	.48	.82
+10	1.22	.85	.89	.71 T	.43	.77
+11	1.01	.78 T	.88	.72	.41	.72
+12	.99	.75	.87	.68	.51	.67
+13	1.01	.69	.87	.65	.72	.68
+14	.83	.63	.90	.67	.79	.68
+15	.73	.58	.91	.62	.75	.64
+16	.70 T	.63	.90	.66	.82	.64
+17	.69	.68	.92	.68	.80	.65
+18	.65	.71	.94	.68	.79	.59

T indicates the last month (trough) of the recession that began in the peak month, as dated by the National Bureau of Economic Research (NBER).

* While not classified as a recession by the NBER, economic activity failed to increase (a "growth recession") between October 1966 and June 1967.

Impact on Agriculture

For the most part, the farming sector has not been involved in the scenario of financial instability outlined earlier. Since the Korean War, cyclical expansions and contractions in farming have had causes and timing largely unrelated to the nonfarm business cycle. Farm financial problems have at times coincided with periods of stress in national financial markets, most recently when livestock producers were financially distressed during the spring of 1974. However, such confluence of financial trouble has been largely a matter of chance. In 1975, when wheat producers encountered cash flow problems as the market price of their large speculative inventory holdings declined sharply, and again in 1976, when feed grain producers underwent similar experience, nonfarm business was generally improving amid relative ease in national financial markets.

Thus the significance of unstable financial markets for agriculture stems not from any widespread participation of farm firms in financial crises, but rather from the impact that credit crunch episodes may have on the availability and cost of farm loans.

Availability of loans

For the most part, the farm sector has been insulated from changes in the availability of bank credit related to business cycle developments. Table 2 shows that rural banks did not experience the swings in liquidity that occurred at other banks during the last two credit crunches. From 1967 to 1975, the average loan/deposit ratio at rural banks fluctuated narrowly around a level of 55 percent, with most of the variation due merely to intra-year seasonal factors.

Between 1975 and 1977, this stable pattern at rural banks was abruptly disrupted when lower farm income reduced deposit inflows while loan demands continued high (Melichar, 1978a). The average loan/deposit ratio at these banks rose sharply to a new level of around 64 percent, even as other banks were experiencing a period of relative ease. The difference between average loan/deposit ratios at rural and other banks thus narrowed greatly. But this did not mean that the cyclical liquidity experience of rural banks would also begin to resemble that of other banks. As monetary restraint increased during 1978, liquidity again was reduced more rapidly at nonrural banks. End-of-quarter loan/deposit ratios at the two groups of banks have behaved as follows since 1976:

Banks with farm loan ratio--

	<u>Under 25%</u>	<u>25% and over</u>
1976-Q4	65	60
1977-Q1	66	61
-Q2	66	64
-Q3	68	65
-Q4	66	62
1978-Q1	68	63
-Q2	69	64
-Q3	71	66
-Q4	70p	64p

Table 2. Average loan/deposit ratios at insured commercial banks, end of quarter (per cent)

Quarters from cyclical peak	Cycle that peaked in--					
	Fourth quarter, 1973		Fourth quarter, 1969		Fourth quarter, 1966	
	Banks with farm loan ratio--		Banks with farm loan ratio--		Banks with farm loan ratio--	
	Under 25%	25% and over	Under 25%	25% and over	Under 25%	25% and over
-8	61	53	60	53	59	48
-6	64	56	63	56	62	53
-4	64	53	62	52	62	50
-2	69	56	66	55	64	54
0 (peak)	68	54	67	53	63	52
+2	70	57	67	57	63	56
+4	69	55	62	54	60	53
+6	66	56	62	56	63	56
+8	65	56	61	53	62	52

In view of the sharply reduced liquidity of rural banks as compared with pre-1976 levels, such banks may try to make more use of sources of funds other than local deposits. If such funds were to be obtained as correspondent credit accommodations--primarily borrowings or loan participations--from large banks, rural banks would be exposed to a known risk that the large banks may sharply reduce the flow of such funds during a credit crunch (Benjamin). If they were to attempt to obtain more funds directly in money markets, the small rural institutions would similarly bear a significant risk of sharp and adverse changes in the cost and availability of these funds during credit crunches. Rural member banks have a third option, borrowing from the Federal Reserve Banks--especially through the seasonal borrowing privilege for which many of them are eligible. The seasonal borrowing program represents an assured source of funds to meet seasonal loan and deposit outflows, and while the Federal Reserve discount rate is usually changed in tandem in money-market rates, its swings have not been as wide as those of the latter.

During credit crunches, suppliers of funds in national markets become alarmed as numerous firms that appeared to have been doing well start showing cash flow problems. They begin to avoid lending to firms and industries where such problems exist or are suspected. If a significant number of farm firms were experiencing severe financial difficulty at the time of a national credit crunch, it would probably become more difficult to sell securities backed primarily by farm loans. Most likely, however, the farm problems would have to be very serious--probably bad enough to have caused falling land prices--before supplies of credit would be thus affected. Barring this extreme situation, credit crunches are more likely to affect agriculture through increased cost of loans rather than through curtailed availability.

Interest rates

In the past, a large proportion of farm borrowers--those obtaining their loans from the small banks found in most of the nation's major farming areas--have been relatively insulated from cyclical changes in money-market interest rates. Table 3 compares the cyclical record of rates on farm loans at two groups of such banks with that of rates paid on money-market borrowing by the nation's most creditworthy corporations. The cyclical swing in the money-market rates was much wider; the business borrowing cost much less during periods of monetary ease, but more during periods of monetary restraint.

Much the same experience has been recorded so far in the present cycle, as shown by Table 4. The most recent data presented in the table, however, may be providing the first evidence of significantly increased cyclical variability of rates at rural banks. The exceptionally large increase in rural bank rates during the last quarter of 1978 may be reflecting the initial impact of an institutional change--the introduction of the money-market certificate of deposit--that is discussed in the next section. At any rate, with that sharp increase in rates, the increase since the cyclical lows had by December 1978 equalled the total rise recorded for the same banks during each of the two preceding cycles.

For the current cycle, much additional detail on farm loan interest rates is being provided by the Federal Reserve System's new survey of terms of bank lending to farmers (Melichar, 1978b). Selected results presented in

Table 3. Average interest rates on short-term business and farm borrowings (per cent)

Quarters from cyclical peak	Cycle that peaked in--					
	Fourth quarter, 1973			Fourth quarter, 1969		
	Commercial paper ¹	Farm loans at banks Ninth District ²	Seventh District ³	Commercial paper ¹	Farm loans at banks Ninth District ²	Seventh District ³
-8	4.7	8.1	7.5	5.6	-	6.5
-7	4.2	8.0	7.5	5.6	-	6.7
-6	4.6	8.0	7.4	6.2	-	6.8
-5	5.2	8.0	7.5	5.8	-	6.9
-4	5.4	8.1	7.5	6.2	7.4	6.8
-3	6.8	8.1	7.6	6.8	7.6	7.0
-2	8.0	8.2	7.7	8.2	7.9	7.2
-1	10.2	8.6	8.3	8.5	8.0	7.5
0 (peak)	9.1	8.6	8.3	8.8	8.1	7.6
+1	8.4	8.5	8.3	8.3	8.4	7.7
+2	11.0	8.8	8.6	8.2	8.4	7.8
+3	11.2	9.0	9.0	7.3	8.4	7.8
+4	9.0	9.1	9.0	5.7	8.4	7.8
+5	6.1	9.0	8.8	4.2	8.2	7.6
+6	5.8	9.0	8.8	5.4	8.2	7.6
+7	6.9	9.0	8.8	5.8	8.2	7.6
+8	6.0	9.0	8.8	4.7	8.1	7.5

^{1/} Monthly average rate on 4-6 month prime commercial paper, end of quarter.

^{2/} Average of most common rates on short-term farm loans at banks representative of farm lending, Ninth Federal Reserve District, end of quarter.

^{3/} Average of typical rates on feeder cattle loans at agricultural banks, Seventh Federal Reserve District, end of quarter.

Table 4 show that the average farm loan rate at large banks exhibits far more cyclical variation than the average rate at smaller banks. The difference in behavior currently occurs at a bank asset size of about \$400 million, which is also roughly the size at which a bank can usually acquire reliable direct access to money-market sources of funds. The large banks account for about one-fifth of the outstanding amount of all farm loans at banks. It is apparent that the average farm loan rate at such banks reflects cyclical changes in money-market interest rates, in part because the banks' cost of loanable funds has changed by some fraction of the money-market change, but also because such banks regard money-market rates as the opportunity cost of their loanable funds. Since rural banks are becoming more exposed to money-market influences, the cyclical variation in their farm loan interest rates can be expected to increase.

Trends and Outlook

Degree of Instability

Why have postwar credit crunches been successively more severe? Very likely, in part because several structural changes and trends have reduced the risk that cyclical rate increases or monetary restraint formerly entailed for financial institutions. With such risk reduced, the behavior of financial institutions has changed in a manner conducive to greater instability, given an economy that remains subject to cyclical inflationary pressures or external shocks (Kaufman, Wallich).

One must first appreciate that financial institutions are themselves firms that can engage in speculative finance. They can enter into loan commitments or make loans at fixed rates while their cost of funds is subject to change. Or, they can make loans with specified longer-term maturities while their sources of funds have shorter maturities or are subject to immediate withdrawal. In these circumstances, which characterized the early 1950's, financial institutions bear the risk of unexpected and rapid changes in the cost or availability of funds, while their borrowers are sheltered at least for the term of their outstanding fixed-rate loans.

Thus when most business lending was done on a fixed-rate basis, a rise in money-market interest rates had a rapid adverse effect on the profit margins of large financial institutions. To cope with the reduced profitability of outstanding loans, rates on new loans had to be raised quickly, and often by more than the increase in the cost of new loanable funds.

In addition, when interest rate ceilings applied to all deposits, including large negotiable certificates of deposit, the ability of major banks to raise funds was jeopardized as soon as market interest rates approached these ceilings. At the same time, the net inflow of deposits at smaller banks and savings and loan associations was threatened. Net cash flows at life insurance companies also suffered when money-market rates surpassed the relatively low fixed rates then specified for policy loans. Thus, many institutions of all sizes had to reduce new lending in proportion to their lower fund inflows.

Through these effects on the profitability and fund supplies of large financial institutions, moderate monetary restraint quickly affected the

Table 4. Average interest rates on business and farm borrowings during the current cycle (per cent)

Quarter	Prime 4-6 month commercial paper	Farm loans at banks				
		Short-term farm loans, Ninth District ¹	Feeder cattle loans, Seventh District ²	Non-real-estate farm loans, United States ³		
				Large banks	Other banks	All banks
1976-Q4	4.7	9.2	8.7	-	-	-
1977-Q1	4.9	9.2	8.7	8.3	8.9	8.8
-Q2	5.5	9.2	8.7	8.1	8.9	8.7
-Q3	6.2	9.2	8.8	8.4	8.9	8.7
-Q4	6.6	9.2	8.8	9.4	9.0	9.1
1978-Q1	6.8	9.2	8.9	9.3	9.1	9.2
-Q2	7.6	9.4	9.1	9.6	9.2	9.3
-Q3	8.4	9.5	9.4	10.4	9.3	9.6
-Q4	10.4	10.2	10.1	11.7	10.0	10.4
1979-Q1	-	-	-	12.5	10.4	11.0

^{1/} Average of most common rates at banks representative of farm lending, end of quarter.

^{2/} Average of typical rates at agricultural banks, end of quarter.

^{3/} Dollar-weighted average of effective rates on loans made in the first full business week of the second month of the quarter.

process of debt creation. That impact, however, was attained at the expense of serious cyclical risks and problems for those institutions. Over time, these risks have been markedly reduced by a series of institutional changes.

One important change has been the proliferation of floating and variable interest rates on loans. Most large business loans are now made on a floating rate basis, as are most of the larger farm loans made by large banks. Farm borrowers from the Federal Land Banks and the production credit associations are on a variable-rate basis. Through these mechanisms, large banks, the Farm Credit System, and some other institutions have transferred the risk of interest rate increases to their borrowers, thereby avoiding the impact of such increases on their profitability.

Another important change was the raising and finally the complete removal of interest rate ceilings on large negotiable certificates of deposit, which large banks sell to raise funds in money markets. This regulatory action freed large banks from the risk of being unable to raise sufficient funds to meet loan commitments or to replace deposit withdrawals during a period of monetary restraint.

As a result of these changes, the lending operations of financial institutions are no longer quickly discouraged by the interest rate increases or monetary restraint initially encountered during a business expansion. Instead of suffering a profit squeeze, financial institutions may find their profits increasing, if one can fairly judge from the operating results for late 1978 now being reported by large banks. Loan availability is maintained, and borrowers who are enjoying higher sales and profits are not likely to be significantly dissuaded from further borrowing by moderate rate increases alone.

Thus the rapid build-up of debt now continues beyond the point at which it earlier would have been slowed by problems of the lenders. More so than before, a reduction in the rate of debt creation depends on substantial increases in the cost of debt or on the perception of potential or emerging borrower difficulties. With regard to the latter constraint, however, Wallich has listed a number of circumstances that lead lenders and portfolio managers as a group to underestimate their risk as a business expansion unfolds (yet, as certain risks of lenders have been transferred to borrowers, the lenders' ultimate risk of loan default has simultaneously been increased). Logically, therefore, financial crises are more severe.

Institutions without significant access to money-market sources of funds—primarily smaller banks and savings and loan associations—remained subject to the consequences of unexpected reductions in deposit inflows whenever market rates rose above ceiling rates on their deposits. But a very recent innovation by the regulatory agencies, the six-month money-market certificate of deposit, has successfully forestalled such experience so far in the current period of monetary restraint. For the first time, these institutions can offer their "large" depositors an instrument whose yield is competitive with market rates even during periods of relatively high short-term interest rates. To live with such an instrument, or, more positively stated, to be able to exploit its fund-raising potential during all types of money-market conditions, it seems likely that these institutions will begin to

adopt floating or variable rate arrangements on their loans (which will be a new experience for most farm borrowers from rural banks). Possibly, though perhaps less likely, these institutions will also discover how to market these certificates--or some future variant thereof--in ways that give them control over the volume of funds raised. If so, they would move toward parity with large banks in terms of escaping the risk of changes in fund availability.

Incidence of Credit Crunches

Minsky and Sinai argue that recurring financial crises are inevitable, because "the basic causal factors...are rooted in the behavioral processes of the economy" (Sinai, 1977). It is further clear that crises cannot be avoided or mitigated through the type of financial innovations and institutional changes that marked the past two decades, and that still seem in vogue.

Sinai has concluded that accelerating inflation is the foremost contemporary cause of financial instability. Once the rate of inflation is stabilized or reduced, he indicates that the incidence of credit crunches would be minimized by practices and policies conducive to moderate and well-balanced business expansions and by the avoidance of external shocks such as wars, commodity shortages, and oil embargos. These highly interdependent conditions will be difficult to achieve fully. Financial crises can therefore be expected to continue to recur in tandem with future fluctuations in economic activity.

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