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Five Myths About Financing Dairy Farm Businesses

by

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The aggregate economic condition of agriculture has seriously deteriorated over the past few years. Low product prices compared to those received in the 1970s, have resulted in low incomes, declining asset values and a high degree of financial stress on many farms. This situation is general enough and severe enough that the plight of the farmer has received considerable attention by both local and national press. Several national television news programs have carried stories on agriculture. Even the Wall Street Journal has carried several articles on the depressed financial condition of agriculture.

The attention given to the real problems of agriculture has created an environment where those who have little contact with agriculture, which includes many directors and senior management personnel at some banks, believe that all farmers are in financial trouble. A natural result of that perception is that you, as the agricultural loan officer, are increasingly being asked to defend the bank's continued involvement in agriculture.

I would like to spend the next few minutes discussing some issues and ideas that relate to the potential desirability of an agricultural loan portfolio and some information that is available to help you accurately assess agricultural loans. My discussion is organized around five separate ideas which I have titled "Five Myths About Financing Dairy Farm Businesses". The basic ideas or concepts behind these myths apply to all kinds of farming but I am relating it specifically to dairy farms because that is the most important kind of farm in New York State and we have more data on dairy farms.

Myth #1: There is a (one) cost of producing milk.

You often hear statements such as "the support price is below the cost of producing milk" or "if the price goes any lower, it will be below the cost of producing milk and we will all go out of business". Statements such as these imply, at least, that there is one cost of producing milk and that the cost of producing milk is the same for all dairy farmers. That, of course, is far from the truth.

One problem in trying to develop data to show the range in the cost of producing milk is how to calculate the cost for individual farm businesses. I used the "farm unit" method of determining costs for the specialized dairy farms that participated in Cornell's Farm Business Summary program for 1984. In applying the farm unit method all receipts except milk sales are assumed to be produced at cost and are, thus, subtracted from

total costs to determine the magnitude of costs to be attributed to producing milk.

The second problem in determining the cost of producing milk is selecting the appropriate costs to include. Particularly, which of the inputs supplied by the operator should be included? Is the cost of producing milk, the cost to the operator or the cost including a fair return to the operator for the labor, management and equity capital he or she provides? To handle the problem, three different "costs" were calculated, each including a different combination of operator supplied inputs.

The first cost of producing milk (COPM I) calculated includes all costs incurred except operator and family labor, operator management and return to equity capital. This cost includes all costs incurred by the operator before receiving any return to the inputs the farmer and his or her family supply, that is, labor, management and equity capital. Any return over these costs is return to the operator (family) for these items. It is the income earned by the family for family living and debt principal repayment.

The second cost of producing milk (COPM II) recognizes that the labor provided by the operator is required to produce milk and that the equity capital used is also required to have the assets to physically produce the milk. Thus, both are included as costs. Calculating the cost of producing milk in this manner includes all costs except the operator's management. Thus, the difference between COPM II and the price received for milk would be the return to management.

The third cost (COPM III) also includes a management charge and, thus, represents the total cost of producing milk if all resources receive a modest return ($9,000 per year for labor, five percent return on equity capital, and a management return of five percent of cash receipts).

A decile distribution of these three costs of producing milk are presented in table 1. Regardless of the costs included, there is a wide array in the level of costs. The highest cost producers have costs that are nearly double that of the lowest cost producers. Some dairymen can make money at what nearly everyone would consider a low price for milk. Conversely, the price could not reasonably be raised to a price high enough for some to cover their production costs. As Stan Warren would say, those farmers in the upper deciles "are already out of business - they just don't know it yet".

In an effort to determine which costs are most important in causing high costs for high cost producers, I divided the farms in to five groups, based on the total cost of producing milk and calculated the average costs for a number of different cost categories. The categories used are shown in table 2. The resulting average costs are shown in table 3. The answer to the

question "what costs are higher for high cost producers" is "all of them!" No particular cost category stands out as the culprit in causing higher production costs. Even interest costs do not trend with total costs. It is, of course, quite likely that within these averages there are individual farms for which certain items are a problem. But, in general, no particular item or group of items are generally responsible for higher costs.

Table 1. Distribution of the Cost of Producing Milk[a] 402 New York Dairy Farms[b], 1984

Decile	COPM I All Costs Except Operator Supplied Inputs[c]	COPM II All Costs Except Management[d]	COPM III All Costs[e]
	-------dollars per cwt--------		
1 (top 10%)	$ 9.10	$11.78	$12.51
2	10.49	13.01	13.74
3	11.06	13.60	14.34
4	11.57	14.12	14.85
5	12.03	14.55	15.29
6	12.53	15.11	15.86
7	12.95	15.73	16.48
8	13.62	16.41	17.17
9	14.36	17.52	18.27
10 (bottom 10%)	16.98	20.36	21.12

[a]Calculated using the "farm unit" method. Income from other than milk sales is assumed to be produced at cost.
[b]Excludes farms receiving dairy diversion payments.
[c]Excludes charge for operator and family labor, charge for management and cost of equity capital.
[d]Includes operator labor only (not management) valued at $750 per month, family labor at $500 per month full time equivalent and an equity capital charge of five percent.
[e]Includes management charge of five percent of cash receipts.

Myth #2: No dairy farmer is making money.

When you look at averages, it is clear that dairy farmers are not making much money. Average incomes are low. However, the implication often drawn from that fact is that no farmer is making money or that most farmers are making no money. However, as shown in table 4, incomes are widely distributed around that low income. For 1984, labor and management incomes per operator averaged $2,262, but the top 10 percent of farmers had incomes that averaged $45,000 while the bottom 10 percent had losses of

nearly $38,000 per operator. The top 30 percent had quite respectable incomes.

Table 2. Items Included in Cost Categories for Cost of Producing Milk

Feed

Dairy Grain and Concentrate
Hay and Other Feed Purchases
Fertilizer and Lime
Seeds and Plants
Spray and Other
(-) Crop Sales
(-) Government Payments
(-) Increase in Feed and Supplies

Labor

Operator Labor ($750/month)
Hired Labor
Unpaid Family Labor ($500/month)

Machinery

Depreciation
Machine Hire
Machine Repair
Auto Expense
Gas and Oil
(-) Government Gas Tax Refund
(-) Custom Machine Work

Livestock Expenses

Breeding Fees
Vet and Medicine
Other Livestock Expense

Milk Marketing

Livestock Ownership

Replacement Livestock
Expansion Livestock
Cattle Lease
(-) Dairy Cattle Sold
(-) Other Livestock Sales
(-) Increase in Livestock

Real Estate

Land, Bldg, Fence Repair
Taxes
Insurance
Rent/Lease
Building Depreciation

Interest

Interest Paid
Interest on Equity @5%

Miscellaneous

Telephone
Electric
Miscellaneous
(-) Misc. Income

Management

5% Cash Receipts

Table 3. Composition of the Cost of Producing Milk[a] by Total Cost 402 New York Dairy Farms[b], 1984

Cost Category	Milk Production Costs Low 20%	2nd 20%	Middle 20%	4th 20%	High 20%
Feed	3.52	4.05	4.28	4.45	4.80
Hired Labor	1.07	1.11	1.04	1.16	.92
Machinery	1.96	2.27	2.42	2.50	3.03
Livestock Exp.	.91	.97	1.04	1.02	1.09
Milk Marketing	.89	.99	1.09	1.11	1.26
Livestock Ownership	-1.33	-1.02	-1.03	-.58	.03
Real Estate	1.36	1.47	1.48	1.53	1.87
Interest Paid	1.29	1.20	1.32	1.36	1.54
Misc.	.43	.45	.47	.55	.61
Total (COPM I)	10.10	11.49	12.11	13.10	15.15
Family Labor[c]	.13	.13	.19	.25	.29
Operator Labor[d]	1.00	.97	1.14	1.26	1.66
Equity Interest	1.07	1.15	1.30	1.39	1.75
Total (COPM II)	12.30	13.74	14.74	16.00	18.85
Management[e]	.72	.73	.74	.75	.75
Total	13.02	14.47	15.48	16.75	19.60

[a]Calculated using the "farm unit" method. Income from other than milk sales is assumed to be produced at cost.
[b]Excludes farms receiving dairy diversion payments.
[c]Includes operator labor only (not management) valued at $750/month and family labor at $500/month full-time equivalent.
[d]Includes five percent interest on equity capital.
[e]Management charge of five percent of cash receipts.

Going one step further and looking at labor, management and ownership income per operator, it is clear that many farmers had a very respectable amount of funds available for family living and reinvestment in the farm business.

From these data it is clear that it is possible to have a loan portfolio of dairy farmers, likely drawn mostly from those in the top 50 percent, that is a very sound portfolio. Such a group would obviously be doing very well: making money, paying their bills and, of course, complaining about the price of milk!

Table 4. Distribution of Farm Incomes
458 New York Dairy Farms, 1984

Decile	Labor and Management Income Per Operator[a]	Labor, Management and Ownership Income Per Operator[b]
1 (bottom 10%)	$-37,953	$-24,715
2	-16,310	-1,621
3	-9,207	4,703
4	-5,032	9,335
5	-1,076	13,930
6	2,704	18,784
7	5,911	22,526
8	9,988	29,227
9	15,149	38,659
10 (top 10%)	45,001	90,420
Average	2,262	19,965

[a]Return to operators labor and management after deducting a charge for equity capital (at 5%). Excludes appreciation, or decline, in the value of assets.
[b]Return to operator for labor, management and equity capital. Includes appreciation or decline in the value of assets.

Myth #3: All farmers with over 40 percent debt are in trouble.

We have all heard that one of the important causes of the financial problems in the midwest is that during the 1970's they did a lot of asset based lending, rather than cash flow based lending. Given the conclusion that asset based lending is inappropriate, it is clear that any assessment of the real financial health of agriculture should be cash flow based. However, when the USDA and universities measure stress, they typically look at debt/asset ratios. The USDA identifies its debt categories with the following description:

Over 70 percent debt = Extreme financial problems
40 - 70 percent debt = Serious financial problems

Clearly the debt/asset ratio is an asset based measure. It gives no real hint at cash flows. Now, having recently worked on a farm finance survey for New York State, I know why they base their analysis on the debt/asset ratio: it is very difficult to get accurate and complete cash flow information. However, using this measure to determine financial stress can be misleading.

The best measure of cash flow is the cash flow coverage ratio. This ratio is calculated as the amount available for debt service divided by the value of the debt payments to be paid. In table 5 the debt/asset ratio categories which many USDA and other people are using is related to the cash flow coverage ratio.

Clearly there is a relationship between the debt/asset ratio and the proportion of farms with sufficient cash flow to make their payments. Decidedly fewer people with lower debt levels had trouble making their payments. However, about one-third of those farms with over 70 percent debt, which the USDA identifies as having extreme financial problems, had more than enough money to make their payments. So, a loan portfolio could contain borrowers with over 70 percent debt and still be a good portfolio. Such farms are often managed by aggressive and progressive individuals who make good incomes, meet their debt commitments and will be the mainstay's in tomorrow's agricultural community. Such a combination makes them a very desirable part of today's portfolio.

Table 6 contains very similar data except the cash flow coverage ratio is related to debt per cow. Debt per cow is a widely used statistic - probably an overused statistic. The temptation to place great weight on the average debt per cow and to raise questions about anyone with above average debt per cow appears to be overwhelming to some people. However, one-quarter of the people with over $5,000 debt per cow and 40 percent of those with over $4,000 debt per cow were able to make their payments - even in a relatively poor year like 1984. If you decided to refuse credit to all with over $4,000 or $5,000 debt per cow, you would be refusing a large number of people who could be very profitable additions to your portfolio.

Table 5. Relationship Between Debt/Asset Ratio and Debt Repayment Capacity 458 New York Dairy Farms, 1984

Debt/Asset Ratio	Cash Flow Coverage Ratio[a]			
	less than .5	.5-.99	1.0-1.49	1.5 and over
	----% of farms in debt/asset category----			
Less than 40%	12	14	20	54
40 to 70%	13	43	35	9
70% and over	27	42	29	2

[a]Amount available for debt payments for 1984 divided by debt payments scheduled for 1985.

Many people find a great deal of security in dealing with accounts with low debt levels: less than $1,000 debt per cow, or less than $2,000 debt per cow. However, this can be false security. One-quarter of people with less than $1,000 debt per cow were unable to make their payments.

Myth #4: There is a good rule of thumb on maximum debt per cow.

Another way of looking at debt per cow is to calculate a cash flow based maximum debt per cow and relate this to a series of management factors. I do this each year for my Farm Finance class and Extension meetings. The data generated by the process are presented on the orange pages (figures 1 - 6).

Calculating a cash flow based maximum debt per cow involves: (1) calculating the cash flow available for debt payments. This is calculated as total cash receipts minus total cash expenses and estimated family living expenses plus any interest included in cash expenses (interest is part of total debt payments), (2) dividing by the amount required to service a dollar's worth of debt at representative credit terms for the year, and (3) dividing by the number of cows. Using this procedure the maximum debt that can be carried is the maximum debt that can be serviced from the cash flow generated. The credit terms used appear on the first orange page (page 9). The terms used may be a little longer than many of you customarily use, but the principles indicated still hold.

Table 6. Relationship Between Debt Per Cow and Debt Repayment Capacity 458 New York Dairy Farms, 1984

Debt Per Cow	Cash Flow Coverage Ratio[a]			
	less than .5	.5-.99	1.0-1.49	1.5 and over
	--% of farms in debt/asset per cow group--			
Less than $1,000	20	4	8	68
$1,000 to $1,999	5	25	26	44
$2,000 to $2,999	12	35	38	15
$3,000 to $3,999	14	47	36	3
$4,000 to $4,999	24	38	26	12
$5,000 and over	32	42	26	0

[a]Amount available for debt payments for 1984 divided by debt payments scheduled for 1985.

DEBT CAPACITY PER COW

by

Level of Management Performance

for

Five Indicators of Managerial Ability

1984

The enclosed tables are calculated from the farm business summaries of those dairy farm businesses that participate in the Department of Agricultural Economics Farm Business Management Program. In determining repayment capacity, estimates were made for cash living expenses and the amount required to service each $1,000 of debt. Cash living costs are estimated at $10,900 per operator plus four percent of cash receipts. The amount required to service each $1,000 of debt was estimated at $174.12 using representative 1984 credit terms. This assumes that real estate makes up 55 percent of the maximum debt and is financed over 25 years at 13 percent interest with monthly payments. Nonreal estate makes up 45 percent of the maximum debt and is financed over seven years at 13.5 percent interest with monthly payments.

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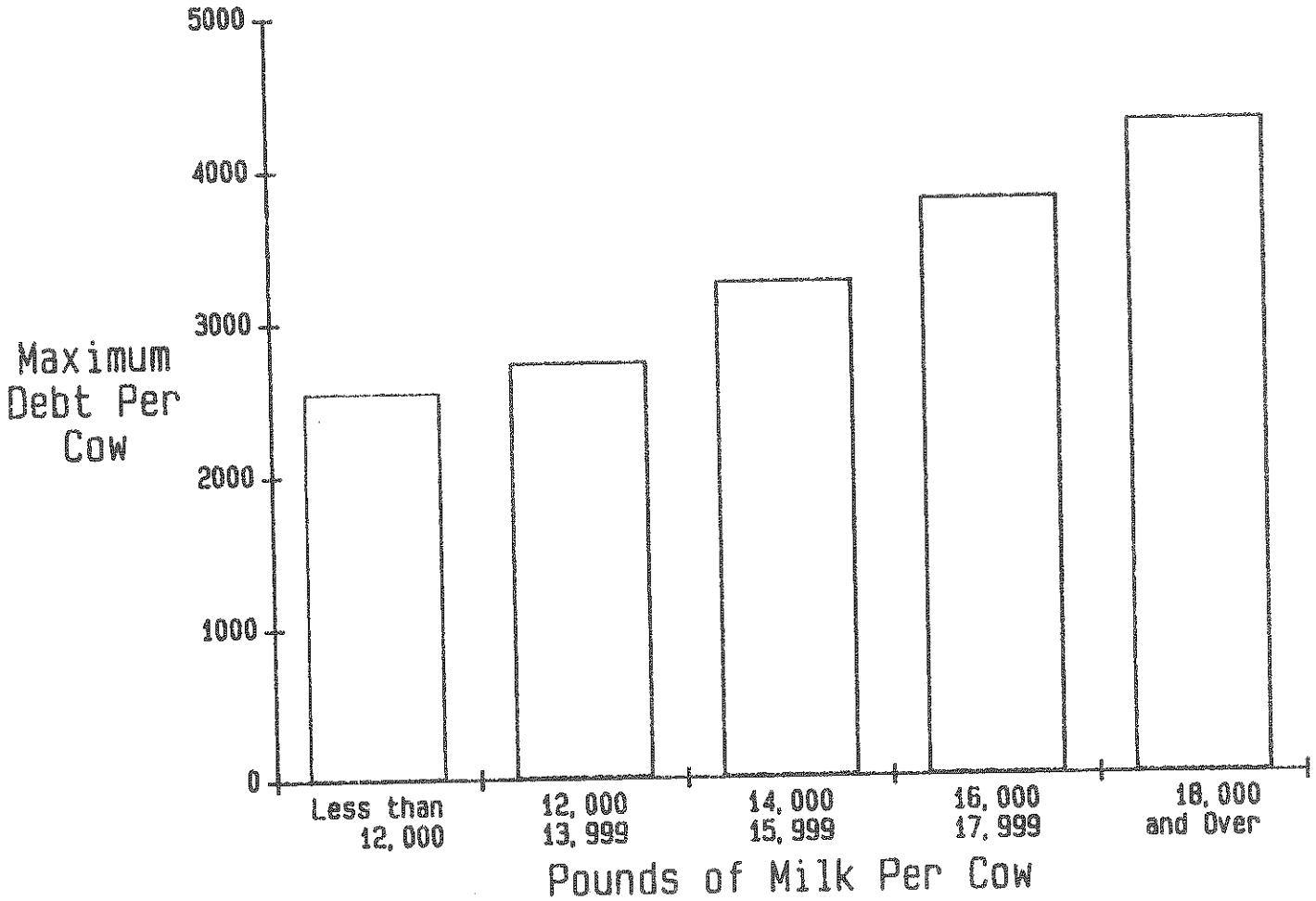
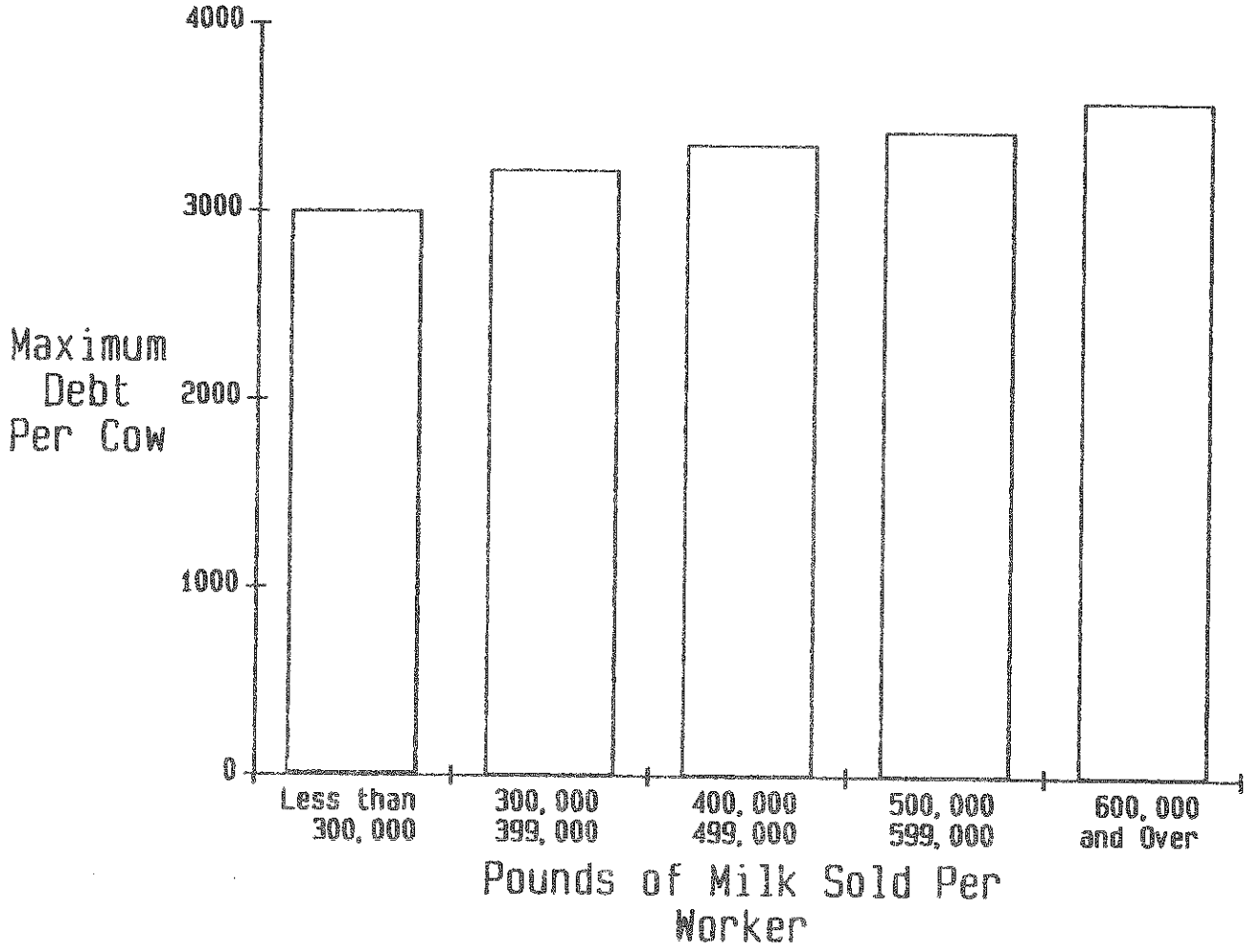
FIGURE 1. DEBT CAPACITY PER COW BY PRODUCTION LEVEL



MILK PER COW AND MAXIMUM DEBT CAPACITY
458 New York State Dairy Farms, 1984

Pounds of Milk Per Cow	Maximum Debt Per Cow
Less than 12,000	$ 2,563
12,000 to 13,999	2,744
14,000 to 15,999	3,266
16,000 to 17,999	3,797
18,000 and over	4,295

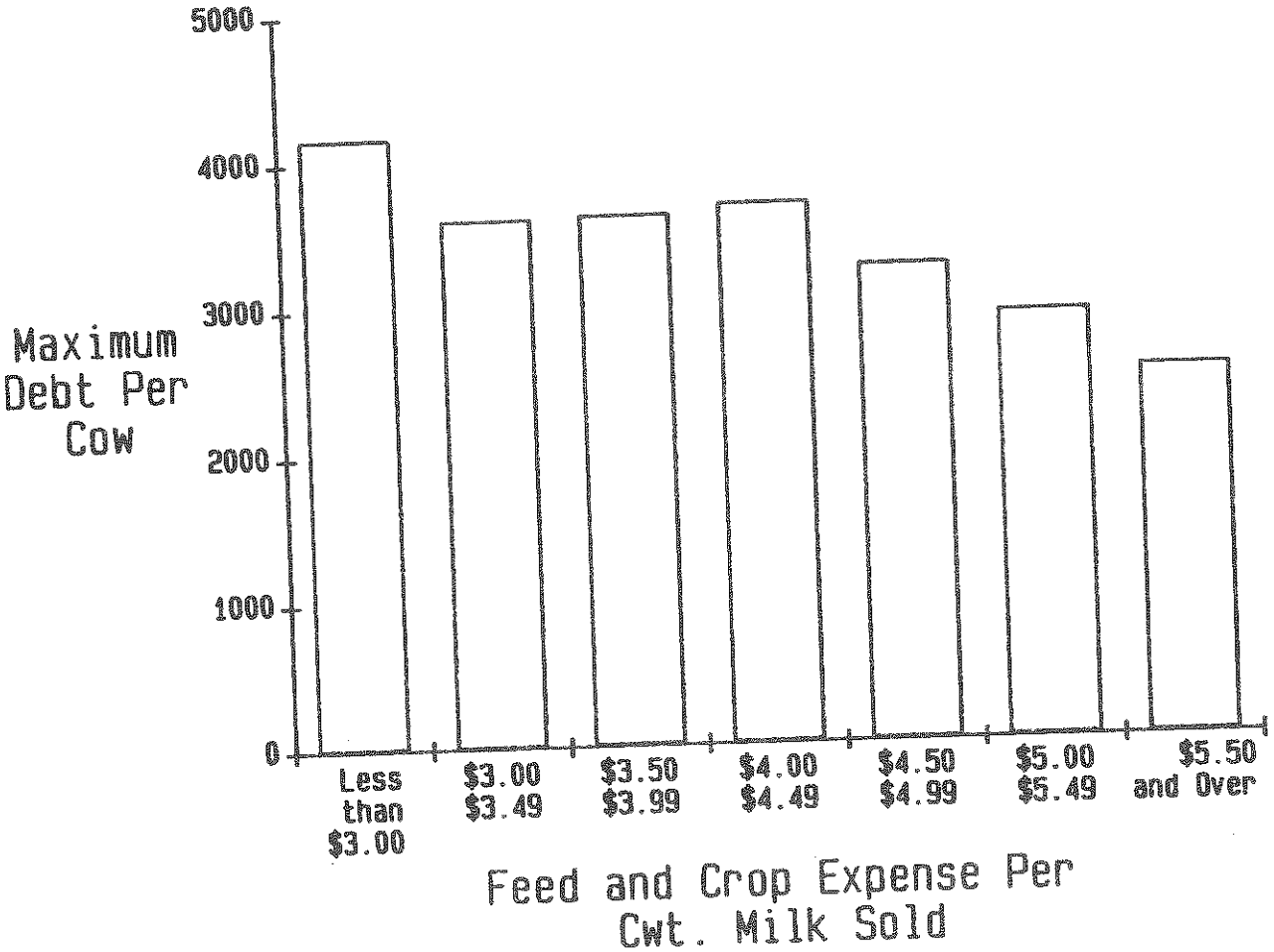
FIGURE 2. DEBT CAPACITY PER COW BY LABOR EFFICIENCY LEVEL



MILK PER WORKER AND MAXIMUM DEBT CAPACITY
458 New York State Dairy Farms, 1984

Pounds of Milk Per Worker	Maximum Debt Per Cow
Less than 300,000	$ 3,009
300,000 to 399,000	3,233
400,000 to 499,000	3,370
500,000 to 599,999	3,442
600,000 and over	3,605

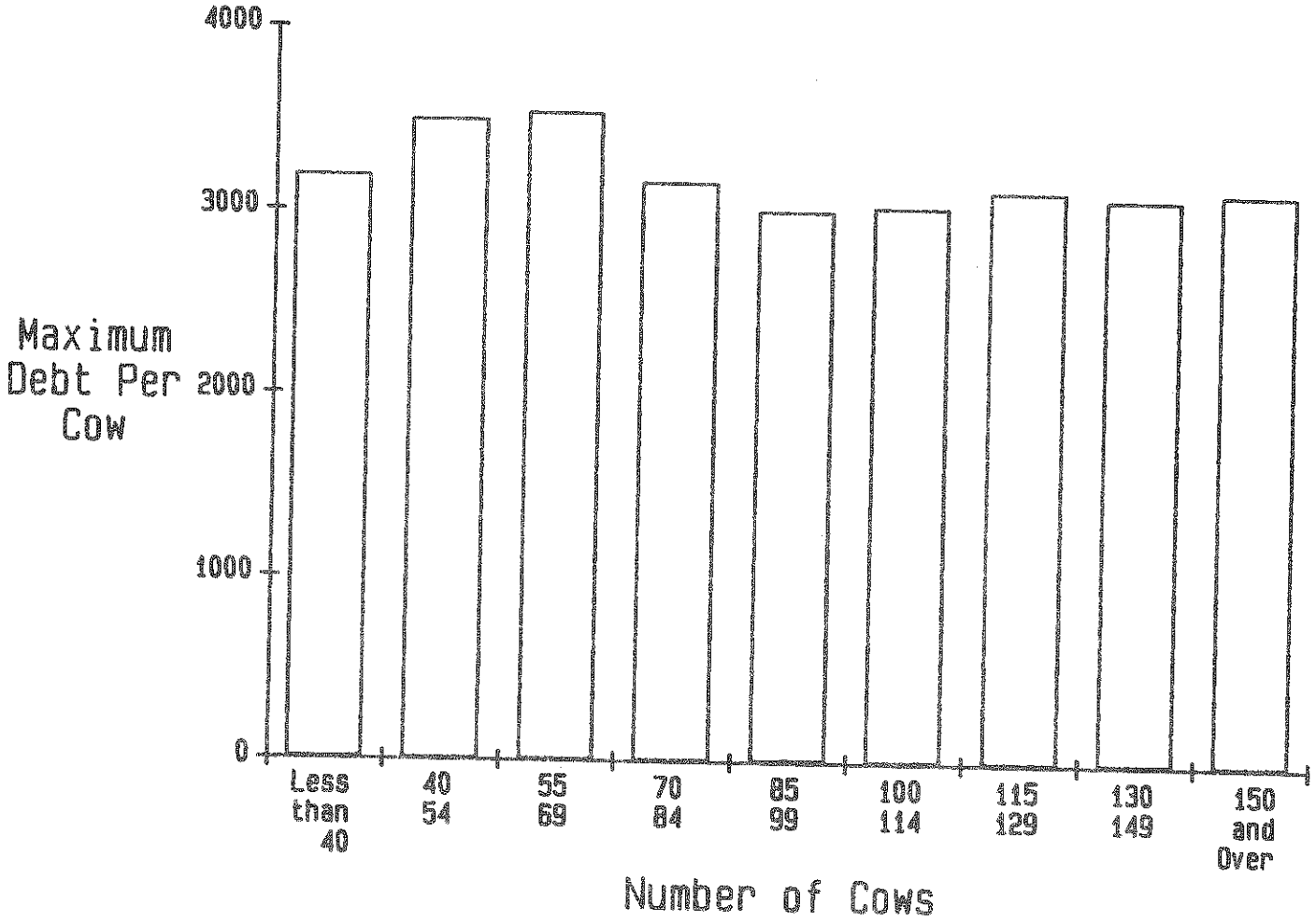
FIGURE 3. DEBT CAPACITY PER COW BY COST CONTROL LEVEL



FEED AND CROP EXPENSE PER CWT. OF MILK AND MAXIMUM DEBT CAPACITY
458New York State Dairy Farms, 1984

Feed and Crop Expense Per Cwt. Milk	Maximum Debt Per Cow
Less than $3.00	$ 4,174
$3.00 to $3.49	3,610
$3.50 to $3.99	3,627
$4.00 to $4.49	3,691
$4.50 to $4.99	3,252
$5.00 to $5.49	2,918
$5.50 and over	2,525

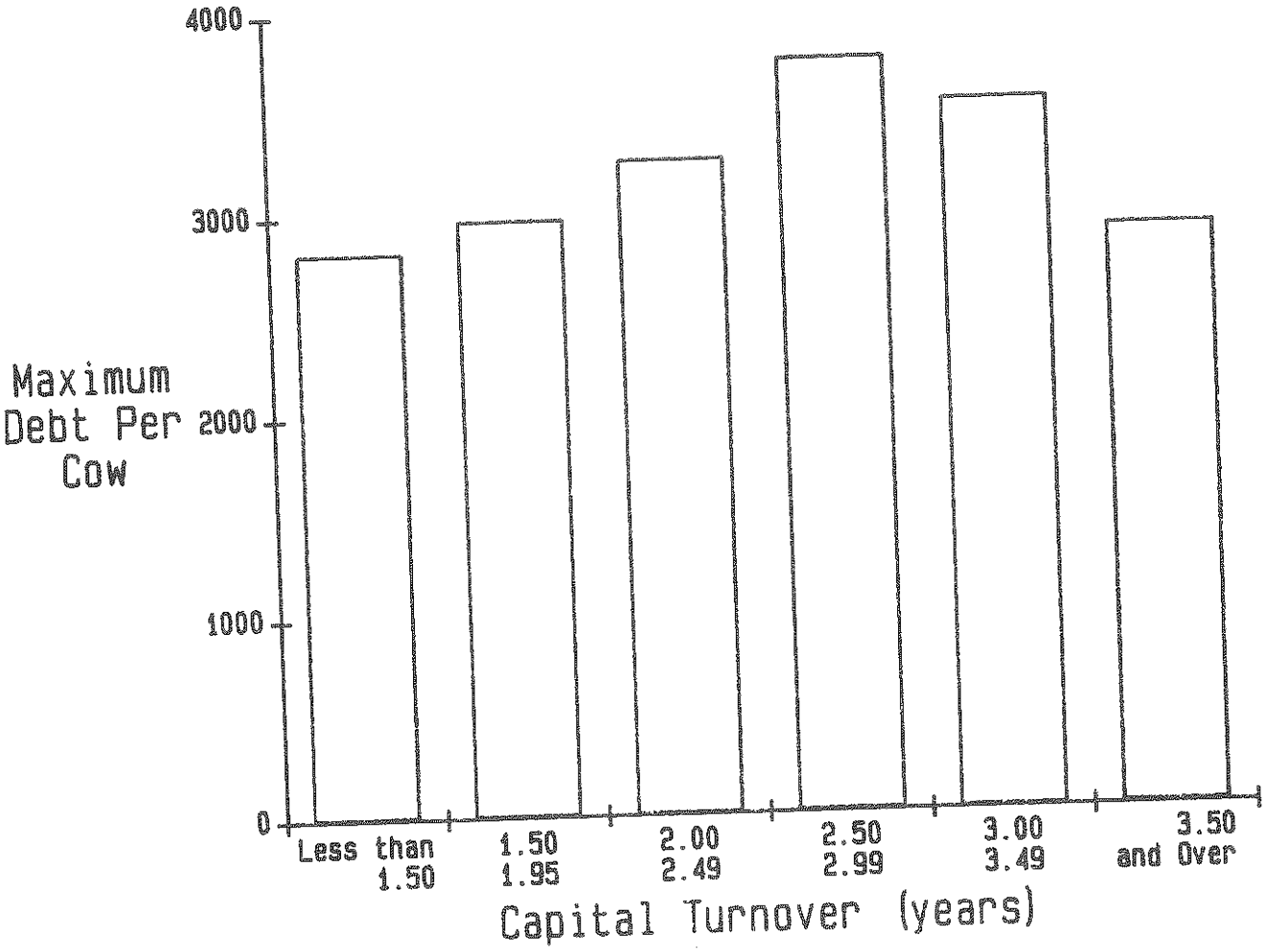
FIGURE 4. DEBT CAPACITY PER COW BY SIZE OF BUSINESS



HERD SIZE AND MAXIMUM DEBT CAPACITY
458 New York State Dairy Farms, 1984

Herd Size (No. of Cows)	Maximum Debt Per Cow
Less than 40	$ 3,196
40 to 54	3,503
55 to 69	3,543
70 to 84	3,167
85 to 99	3,017
100 to 114	3,042
115 to 129	3,131
130 to 149	3,096
150 and over	3,132

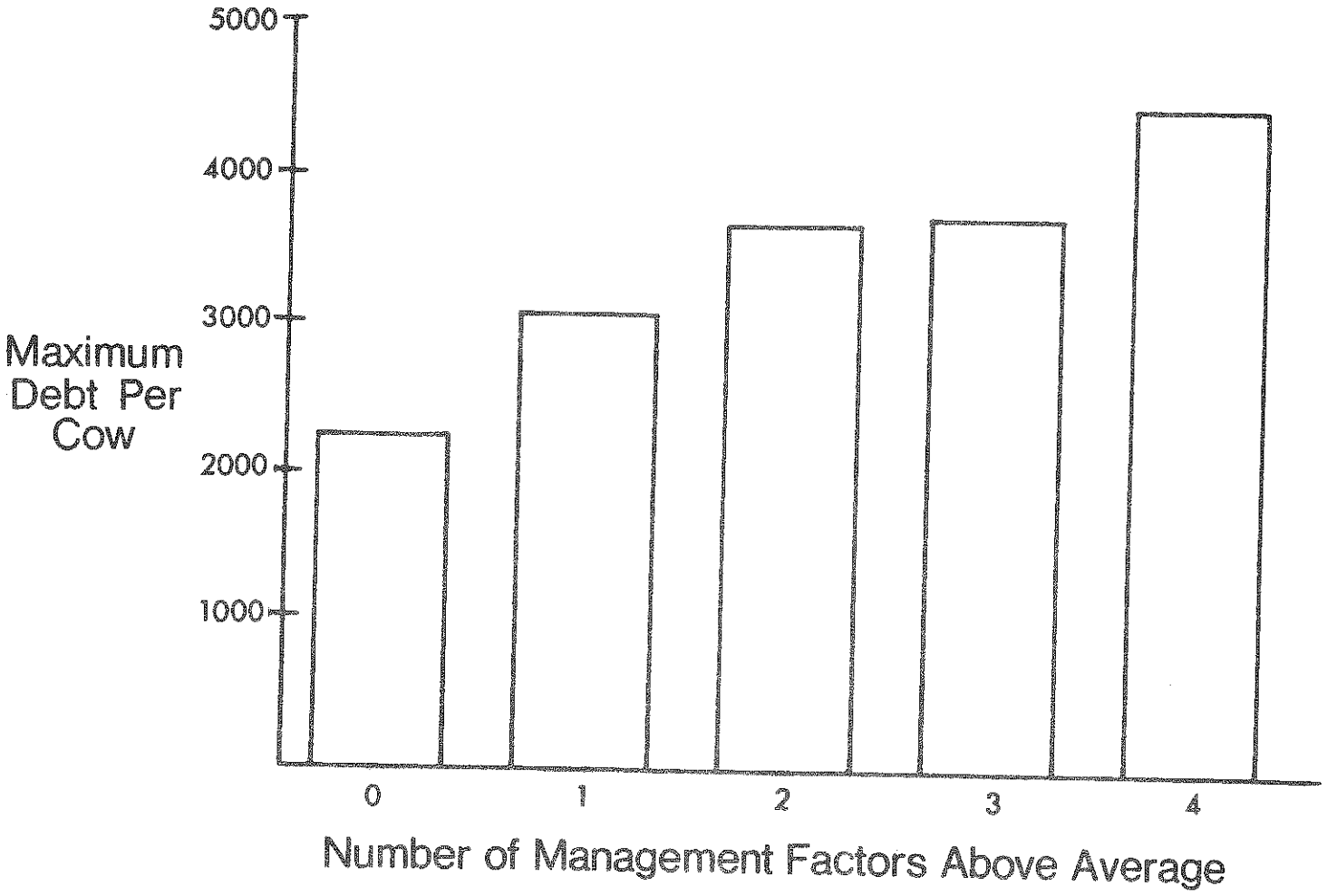
FIGURE 5. DEBT CAPACITY PER COW BY CAPITAL EFFICIENCY LEVEL



CAPITAL TURNOVER AND MAXIMUM DEBT CAPACITY
458 New York State Dairy Farms, 1984

Capital Turnover in Years	Maximum Debt Per Cow
Less than 1.50	$ 2,825
1.50 to 1.99	2,981
2.00 to 2.49	3,268
2.50 to 2.99	3,755
3.00 to 3.49	3,536
3.50 and over	2,895

FIGURE 6. DEBT CAPACITY PER COW BY COMBINED MANAGEMENT PERFORMANCE



MANAGEMENT FACTORS ABOVE AVERAGE AND MINIMUM DEBT CAPACITY
458 New York Dairy Farms, 1984

Number of Management Factors[a/] above Average	Maximum Debt Per Cow
0	$2,213
1	3,005
2	3,381
3	3,779
4	4,453

a/ Management factors include: milk sold per cow, milk sold per worker, feed and crop expense per hundredweight of milk, and capital turnover ratio.

Each of the figures 1 through 6 illustrate graphically and in chart form the relationship between a management factor and maximum debt per cow. There is a strong relationship between production level as measured by pounds of milk sold per cow and maximum debt per cow (figure 1). Maximum debt per cow on farms with less than 12,000 pounds of milk sold per cow averaged only about $2,600, while those getting over 18,000 pounds per cow could make payments on $4,300 debt.

Higher labor efficiency also results in higher debt per cow. However, the increase is only about 20 percent (figure 2). I would point out, however, that similar data for past years have shown a stronger relationship between labor efficiency level and maximum debt per cow.

The degree of cost control is also strongly related to maximum debt levels (figure 3). Farms with feed and crop expense per hundredweight of milk of less than $3.00 could handle $4,200 debt per cow while those with costs exceeding $5.50 could handle an average of only $2,500.

Figure 4 indicates that size of business is not related to maximum debt per cow. This basic result has also appeared in prior years, although a modest improvement in debt capacity as herd size increases from the smallest herd size group (less than 40 cows) up to 55-69 cows per farm has sometimes been observed.

Farms with optimal capital efficiency as indicated by the capital turnover ratio (total investment divided by total receipts) have about $1,000 higher debt capacity than farms with over or under investment (figure 5).

Since farm size is basically unrelated to debt carrying capacity, size was omitted in determining the combined effect of management factors on maximum debt carrying capacity. Farms that were above average in all four management factors had twice as much debt carrying capacity as those above average in none (below average in all) of the management factors (figure 6).

Clearly, good managers can handle considerably more debt than poorer managers. Thus, any rule of thumb that limits loans to those with less than "x" dollars of debt per cow or "y" debt/asset ratio is not a good lending practice. Such a rule will result in giving too much credit to poorer managers and too little credit to better managers. Over time such a procedure can be expected to result in an accumulation of poorer managers in the farm loan portfolio. Good managers who want to use credit as a management tool will gravitate towards other lenders who recognize their ability to handle higher debt levels.

Good lending practice requires estimation of cash flows and actual repayment capacity. Estimating cash flows is, of course, more difficult than relying on some maximum debt level. It is also subject to estimating error. However, in the long run it

can be expected to generate a higher quality loan portfolio than can be obtained through the use of nice rules of thumb.

Myth #5: There is a (one) numerical standard that all loans should meet.

Many of you are under increasing pressure to provide more quantification in the analysis of farm loans. Senior management and loan committees are encouraging use of standards of comparison like those provided for other types of businesses by Robert Morris Associates or Dunn and Bradstreet.

At the same time, Boards of Directors and loan review committees are also taking a very careful look at farm loans and in doing so, gravitating towards the use of more averages and standards with considerable focus on having less than average debt per cow (or other productive unit). Although the move towards more quantification may be a healthy occurance, the previous discussion on maximum debt per cow indicates that focus on averages or other single number standards can lead to less than desirable results.

For a number of years I have annually prepared a Financial Analysis Chart from our Farm Business Summary records which allows more quantification without relying on single numerical standards (blue sheet - page 19). The Financial Analysis Chart is like the Farm Business Chart. It provides decile distributions of various financial analysis ratios. The data for each ratio are independent of the other distributions (each column is independent) allowing the comparison of any business to other businesses for any particular ratio.

This chart allows the farmer and lender to determine where any particular business falls in comparison to other business without being tied to a single number. A business can be assessed as strong or weak in a particular category, rather than being above or below a particular cut-off point.

The chart also provides a basis for a complete ratio analysis of a business. Completing the chart allows an identification of the various strengths and weaknesses of the business and provides a basis for allowing trade-offs in the overall analysis of the business. For example, strong liquidity might allow acceptance of a loan even though the business's debt/asset ratio is relatively high.

The Financial Analysis Chart provides ratios for the four commonly used ratio categories: liquidity, solvency, profitability and capital efficiency. Several ratios are provided for each ratio category. The definition of each ratio appears on the back of the chart. Some of the ratios have higher data requirements than others. For example, debt payments as percent of milk sales is usually easier to obtain than the cash flow coverage ratio. Although debt payments as a percent of milk

sales is not as good a liquidity ratio as the cash flow coverage ratio, the ease with which it can be obtained may make it preferable for certain situations. Alternately, some ratios are good substitutes. For example, the leverage ratio and percent equity provide the same information. Lenders accustomed to using percent equity may choose to ignore the leverage ratio.

The Financial Analysis Chart has been completed for a business we will call I.M. Farmer. We can refer to the business as we discuss the ratios. The most accurate measure of liquidity is the cash flow coverage ratio. Debt payments as a percent of the milk check is easier to obtain but only measures gross income with no consideration given to costs. Scheduled debt payments per cow and available for debt service per cow provide information to help understand why the cash flow coverage ratio takes a particular value. That is, a high ratio may be caused by excessive payments or inadequate income. Debt per cow is not a good liquidity ratio in that it only indicates the level of debt that each unit of the production asset (cow) must carry. However, it is a widely used barometer. I.M. Farmer has trouble making his payments but the ratios give no single clear-cut reason. Debt is not excessive, available for debt service is quite good, but payments are also quite high.

The most used measure of solvency is percent equity. The leverage ratio (debt/net worth) provides the same information and is widely used in nonfarm businesses and, thus, may be useful in explaining loans to people accustomed to nonfarm analysis of businesses. The current and intermediate debt/asset ratio and the long term debt/asset ratio are useful in assessing the distribution of debt. For example, I.M. Farmer has a high current and intermediate ratio indicating that the repayment problem may be the result of having too much of the debt short term causing high debt service requirements even without excessive debt.

The profitability measures are standard for financial analysis of the business. By comparing the performance of the business to other businesses in the same year, the level of profitability can be placed in perspective. The rates of return earned by I.M. Farmer are not impressive when looked at in isolation, but when compared to other businesses we see that the performance is above average.

Capital efficiency indicates the apparent efficiency of business investments. Capital turnover indicates the efficiency of the total investment in generating income. Investment levels can, as we have seen earlier, be either too high or too low. The rationale behind machinery investment per cow is that machinery is basically a nonincome generating asset. High machinery investment represents a high level of nonincome-generating assets which implies a high level of overhead costs. The less machinery a farmer can have and still get the work done correctly and on

FINANCIAL ANALYSIS CHART
458 New York Dairy Farms, 1984

I. M. Farmer

Liquidity (Repayment)

Scheduled Debt Payments Per Cow[1]	Available for Debt Service Per Cow[2]	Cash Flow Coverage Ratio[3]	Debt Payments As Percent of Milk Sales[4]	Debt Per Cow[5]
$ 36	$909	7.67	2	$ 104
176	640 600	2.16	9	638
277	537	1.41	14	1142
362	469	1.10	19	1625
438	411	.91 .86	22	1930
500	357	.75	26	2377
571	279	.58	~~30~~ 30	2688 3000
656 700	216	.46	35	3161
752	126	.28	40	3770
971	-95	-.56	52	5072

Solvency

Leverage Ratio[6]	Percent Equity[7]	Debt/Asset Ratio (%) Current and Intermediate[8]	Debt/Asset Ratio (%) Long Term[9]
.02	99	0	0
.12	90	4	2
.24	81	11	14
.37	73	16	30 33
.51	67	23	41
.70	60	29	51
.94 1.0	53 50	37	62
1.22	46	45	73
1.72	38	55	85
5.04	20	~~80~~ 80	127

Profitability

Percent Rate of Return on Equity[10]	Percent Rate of Return on Investment[11]
18	13
8	9
5	~~7~~ 7
3	6
~~1~~ 1	4
-1	3
-3	1
-6	0
-11	-3
-37	-8

Efficiency (Capital)

Capital Turnover (Years)[12]	Real Estate Investment Per Cow[13]	Machinery Investment Per Cow[14]	Total Farm Assets Per Cow[15]
1.60	$1305	$ 450	$3660
1.90	1882	637	4432
2.06	2120	760	4932
2.20	2333	889	5291
2.34	2579	1005 1000	5574
2.51 2.6	2828	1135	5948 6000
2.66	3138 3500	1283	6479
2.95	3561	1447	7020
3.25	4134	1658	7828
4.54	5694	2259	9891

DEFINITIONS

1/ **Scheduled Debt Payments Per Cow** - Debt payments scheduled to be made during the coming year (as known at the end of the current year) divided by the end-of-year number of cows.

2/ **Available for Debt Service Per Cow** - Net cash farm income (cash receipts minus cash expenses excluding interest paid) plus off-farm income minus family living expenses (estimated at $10,900 per operator plus four percent of cash receipts), divided by the average number of cows.

3/ **Cash Flow Coverage Ratio** - Amount available for debt service per dollar of annual scheduled debt payment, computed by dividing the available dollars by the annual payments planned. A high, positive ratio indicates a strong capacity to repay debt.

4/ **Debt Payments as Percent of Milk Sales** - Amount of milk income committed to debt repayment, calculated by dividing scheduled debt payments by total milk sales ($).

5/ **Debt Per Cow** - Total end-of-year debt divided by end-of-year number of cows.

6/ **Leverage Ratio** - Dollars of debt per dollar of equity, computed by dividing total farm liabilities by total farm equity (nonfarm assets and liabilities are excluded).

7/ **Percent Equity** - End-of-year farm net worth divided by end-of-year total farm assets (nonfarm assets and liabilities are excluded).

8/ **Current and Intermediate Debt/Asset Ratio** - All farm liabilities on less than 10 year repayment divided by all farm assets excluding real estate and other long term assets.

9/ **Long Term Debt/Asset Ratio** - Farm liabilities on 10 years or more repayment, including all real estate mortgages, divided by the value of farm real estate and other long term assets.

10/ **Percent Rate of Return on Equity** - Return on equity capital divided by farm net worth. Includes the change in market value of all assets.

11/ **Percent Rate of Return on Investment** - Return on all farm capital (no deduction for interest paid), divided by total farm assets. Includes the change in market value of all assets.

12/ **Capital Turnover** - Average total farm assets per dollar of total farm income. This indicates the number of years required for total farm income to equal total farm assets.

13/ **Real Estate Investment Per Cow** - End-of-year investment in real estate divided by end-of-year number of cows.

14/ **Machinery Investment Per Cow** - End-of-year machinery investment divided by end-of-year number of cows.

15/ **Total Farm Assets Per Cow** - Total end-of-year farm investment divided by end-of-year number of cows.

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time, the more profitable the business. Real estate investment per cow has a similar rationale to machinery investment to the extent that real estate investment reflects building investments. Excess building investments can be expected to result in high building costs. Investment in buildings is only profitable if it improves efficiency. Care must be exercised in the use of real estate investment per cow, however, because it also includes the value of land, which is a productive asset. High real estate investment caused by large amounts of high quality land could represent efficient rather than inefficient investment. Total investment per cow indicates the total investment made per unit of productive asset. Excessive investment indicates a high level of overhead costs that must be covered by that single unit of productive asset (cow).

Concluding Comments

I hope that some of the information I have provided today will be useful to you in analyzing your farm loan portfolio and in explaining and defending your analysis of loans to those with less background in agriculture. These are challenging times for agriculture and agricultural lenders. We must continually try to keep the real picture of agriculture in focus and not get led astray by generalizations made for and by the press. Good luck!!