External Equity Financing in Agriculture Via Profit and Loss Sharing Contracts: A Proposed Financial Innovation

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An institutional arrangement and contracting procedure by which external suppliers could potentially satisfy the demand for farm equity in a profit and loss sharing arrangement is outlined. An accounting schedule for calculating the equity division of owner and external equity is developed and presented. ©1995 by John Wiley & Sons, Inc.

The farm financial problems of the last decade have revealed the limitations and weaknesses of debt financing. The favorable economic conditions in the 1970s where the real cost of debt was close to zero and the real return on assets was high, created a climate where debt financing and high leverage were advantageous. In the early 1980s, lower commodity and land prices, and higher and more volatile interest rates lowered the return on farm assets and increased farm financial risk.

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These conditions led to a significantly higher incidence of credit problems, loan delinquencies, foreclosures, and bankruptcies in agriculture. Highly leveraged farmers were affected most. In response to the problems incurred from excessive debt financing, external equity financing of production agriculture is increasingly being proposed as a possible financing alternative that can help farmers better manage financial risk.

The structural characteristics of agriculture, however, create barriers to the flow of equity capital between the farm and nonfarm sector. These barriers stem primarily from the organizational structure of production agriculture with the corresponding high transaction costs: the search and information, underwriting, and monitoring costs associated with sole proprietorships and small partnerships contracting for external equity. These characteristics have impeded the development of an equity market to accommodate the flow of investment funds into agriculture, except the direct or shared ownership of farm assets. Existing market mechanisms, such as going public, selling

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shares of common stock, or creating limited partnerships involve high transaction costs, even for large commercial farms. This article outlines a potential institutional arrangement and contracting procedure by which external suppliers could satisfy the demand for farm equity.

A significant body of work has been done on the topic of external equity financing of agriculture.[1-6] Financing farm firms with external equity instead of debt has the potential for transferring risk to external investors, increasing available capital to farm operators. Several models of capital structure in agriculture have emerged,[4,7-11] but, only one model explicitly differentiates between farm and off-farm equity at the firm level.[12]

This study proposes a basic institutional framework necessary because financial intermediaries currently do not exist that can effectively transfer equity capital into agriculture. Collins and Bourn[4] (p. 1336) examined the economic conditions surrounding external equity financing and concluded:

> Therefore it appears that the potential for a sizable market may exist (for external equity), and the primary obstacle is the lack of appropriate financial institutions and instruments.

Moreover, Collins and Bourn[4] state that whatever institutions or instruments are developed to provide this intermediation function must address four potential restraining barriers. First, the principal-agent problem must be addressed to preserve the management incentive in agriculture. Second, any instruments or arrangements developed must provide flexibility to the farmer and liquidity to the investor. Third, the investor requires a secured equity position equal to the farmer's equity position so that the investor's claim is not second to the farmer's claim in case the business fails. And fourth, the double taxation feature of a corporation should be avoided.

Many profit and loss sharing (PLS) principles of Islamic banking could be applied as an American agricultural finance innovation to aid the flow of equity capital from the nonfarm to the farm sector.[6] From the perspective of applying selected PLS principles to production agriculture in the United States, the following financial market structure is outlined as one that might be put in place to give farmers a realistic and practical opportunity to choose between debt and equity financing.

Proposed Institutional Structure

There are three primary actors in this system: the user of capital, or the farmer entrepreneur; the intermediary, or the investment institution; and the provider of capital, or the supplier of investment deposits. The investment institution provides an intermediary function in its truest form because it has a contractual relationship with the investor and with the farmer, but the farmer and investor do not have a direct relationship with each other.

Agricultural intermediaries can function to aid the flow of funds from nonfarm and urban areas to rural agricultural areas, and vice versa. Generally, nonfarm funds are not available to individual farm producers in rural areas until an investment institution collects them and makes them available. As part of this collection process, funds from several savers are aggregated into larger units, thus enabling a farmer to receive funds from a single source rather than multiple sources. By aggregating the funds from many sources, the financial intermediary can provide for the needed liquidity of the savers and farmers while providing large amounts of capital in unified form and in unique periods. By involving many participants in the market, the liquidity needed by savers harmonizes with the liquidity of farm securities. Moreover, the financial intermediary can reduce agricultural lending risks by investing loanable funds in a loan portfolio diversified across economic sectors and geographic areas. Further, the intermediary can substitute its own financial strength for the strength of the individual borrower.

The functions of a financial intermediary for debt funds are very similar to the functions of an investment bank for equity funds. Moreover, the characteristics of an ideal agricultural equity mar-

ket closely parallel the characteristics of an ideal credit market.[13] The characteristics of an ideal equity market in agriculture are:

1. accessibility in obtaining equity funds;
2. reliability so equity capital is available through both good and bad economic times;
3. versatility so equity capital for agricultural producers is available for a variety of purposes;
4. cost effectiveness so costs of equity capital are comparable with such costs in other economic sectors, and not too high or too low for too long; and
5. tailored terms so investment sizes, maturities, profit-and-loss accounting and payment patterns, and security requirements fit the entrepreneur's needs.

In the proposed equity market, called the profit and loss sharing equity market (PLSEM), the investment institution (bank) could operate two windows. The first window would accept the federally insured traditional interest-bearing deposits as banks do now. There would be a second window available accepting uninsured noninterest bearing investment deposits. These investment deposits would be the bank's pool of funds that it would use to invest in profit-and-loss-sharing investments and would be very similar to Islamic unauthorized PLS investment deposits.[6] The return to the depositor on these deposits would be a percentage of the profit that the bank made on its diversified portfolio of PLSEM investments.

By properly diversifying its PLSEM investment portfolio, the bank can protect its investment funds from sustained losses. Although agriculture as a whole is subject to widespread secular trends that are not independently distributed, geographic and commodity diversification can reduce the importance of individual events on the total portfolio. Individual banks can attract investment deposits as their (the bank's) track record of profitable, judicious investment strategies became known to the public. In the event that all of agriculture sustained widespread losses or gains, the bank's complete portfolio of all investments, including PLSEM investments, would be weakened or strengthened, respectively. Institutions that managed and invested their PLSEM funds in farm businesses and provided a competitive return to the investor would be successful in attracting additional funds to invest in agriculture.

There would be a contractual arrangement between the investor and the investment institution. The investment deposits would need to be committed for a minimum amount of time, and in minimum amounts, similar to the commitments required by certificates of deposit now offered by commercial banks. The major difference is that a fixed-percentage share of investment profits would be guaranteed, not a fixed rate of return. The penalty for an early withdrawal would be stated and consequently the investor would know the liquidity properties of the investment. When there are many potential investors participating in the market, the time commitment of an investment is more flexible, leading to a condition where the liquidity penalty for an early withdrawal could be small.

It is also possible that ownership shares of a PLSEM fund could be sold as tradable shares instead of shares specified as term deposits. In either case, if the shares or certificates are tradable, a market for them will develop and establish share values and rates of return for the fund. These will be, to some extent, different from the rates of return and asset values of the underlying agricultural assets. The existence of such a market will provide additional information on external equity investors' expectations of future agricultural asset values and rates of return. Unless direct equity investors and external equity investors have different expectations or desired rates of return, these market signals should converge over time. Nevertheless, the existence of such a market should add to the breadth and responsiveness of the market for agricultural assets.

A written contract between the investment institution and the farmer entrepreneur, specifying the terms of the equity arrangement, would be required. The following is an outline of the basic procedures of such an arrangement where the investment institution invests capital in a project or farm operation for a specific period. The actual terms of the contract would be drafted using the guidelines for agricultural contracts found in a state's legal code.[14]

Contracting Procedure

I. Before contracting, the farm operation is appraised by an independent appraiser acceptable to both the bank and the farmer.

II. Profits and losses, consisting of net farm income plus unrealized capital gains and losses, are divided between the farmer and the investment institution, based upon the percentage of equity ownership each party has in the total operation.

III. The farmer manages the operation and is entitled to a fee for this service. The contract specifies the size of the fee and the conditions of its payment. The fee would be a percentage of the value of farm production. In some situations, it is appropriate to have part of the management fee tied to the after tax annual income as a bonus, thus providing an incentive for the manager to earn a larger after tax income. The fee should be comparable to those paid to managers of similar farming operations.

IV. The farmer develops a long-range business plan for the operation. A strategic plan (for a specified period, say 10 years) is outlined in appropriate detail. The farmer provides this plan that at a minimum should include: 1) a statement of short-term and long-term business goals; 2) an assessment of the operating environment covering the current economic, social, political, and legal environments of the business and how they might change in the future; 3) a complete listing of the resources the business currently owns or controls; 4) a listing of the opportunities, strengths, weaknesses, interests, preferences, and deficiencies of the individuals who manage the business; 5) a list of the most realistic feasible alternatives for the farm operation given the information in steps 1–4; 6) a strategic plan of action to carry out the most feasible alternative specified in step 5; 7) a production, logistical, and financial assessment of the strategic plan including analysis of environmental impact, profit, cash flow, and equity changes; 8) a listing of the constraints that may limit the strategic plan; 9) the production and financial benchmarks by which the success of the plan may be measured; 10) the procedures for monitoring the progress of the business in meeting its objectives; and 11) the conditions signifying when the plan needs to be revised and the revision procedure. This business planning structure is proposed to provide management flexibility for the farmer, and to alleviate the concerns of the investors about how the manager would respond to changing conditions.

V. The farmer is required to follow specified accounting practices agreed upon by the bank. The farm accounting guidelines recently recommended by the Farm Financial Standards Task Force (FFSTF)[15] are an example of the type of accounting practices required to effectively monitor the financial operations of the business. The bank has the right and the responsibility to review these records and audit them regularly (perhaps quarterly). Corrective measures and penalties for neglect, mismanagement, or unacceptable deviations from the proposed budgets and plans are addressed in the contract. Any penalties are enumerated and agreed upon in advance. The accounting guidelines that the farmer and the bank agree to use help determine the operating profit from the operation and the capital gains from the assets that are split between the farmer and the bank.

VI. There is an annual review of the operation in which the farmer shows and documents all income and expenses for the operation. This is reconciled with the proposed annual plan and budget approved at the beginning of the year. The net worth of the operation is declared based on the appraisal of an independent auditor/appraiser acceptable to both parties. Both the bank and the farmer share the cost of the appraisal according to their percentage of ownership. If both parties agree, as an alternative to a full annual appraisal, certain assets (i.e., real estate) can be adjusted according to an acceptable index. Rewards and penalties for management performance are accounted for. The farmer prepares and presents a proposed budget.

VII. The two sources of an increase from the farm operations are net farm income and unrealized capital gains. The net farm income at the end of the year is divided between the farmer and the bank according to the percent of equity ownership as explained in step II. The farmer has the option of reinvesting part or all retained earnings in the farm to increase the

percentage of ownership. Alternatively, the farmer's wealth portfolio could be diversified by investment in outside investments. The investment institution can retain its earnings in the farm only with the farmer's permission, and consequently the percentage of ownership can change from year to year. Similarly, the unrealized farm capital gains are divided on the balance sheet between the farmer and the bank according to their respective beginning of the year ownership percentages.

VIII. At the end of the strategic planning period specified in step IV, the farmer has the option of purchasing any or all of the remaining equity from the bank. The bank has the option of requiring the farmer to buy back any or all of the bank's equity position if the farmer violates any of the contractual agreements. One condition could be that the total farm debt cannot exceed total equity by some specified percentage. Another condition may be that external equity cannot exceed some predetermined percentage of total equity. An important implication of these conditions is that if the bank demands payment, foreclosure or liquidation of the farm may be necessary if the farmer cannot obtain the necessary cash. Both the bank and the farmer share the cost of the appraisal according to each percentage of ownership.

IX. In case of total liquidation or bankruptcy, the equity holders are second to the debt holders in claims on the assets. The assets would be sold and creditors would be paid first from the cash proceeds. The remaining cash or debt obligations would be shared by the bank and farmer according to their respective share of equity ownership or according to a prearranged agreement pertaining to total liquidation.

Obviously for a contractual arrangement of this type to be successful, the transactions costs, agency problems, and monitoring costs must be addressed and minimized. This procedure addresses major barriers to external investment as outlined by Collins and Bourn,[4] and Fisk, Batte, and Lee.[2] The principal-agent problem has been addressed by providing incentives so that the manager puts forth acceptable levels of effort. Also, the contract is structured so that the farmer has the freedom to respond to changing conditions without interference. Intermediaries will be interested only in those operations that show a competitive return on their investment with small monitoring costs and risk. Similarly, farmers who are efficient managers will be more willing to accept external equity if it gives them the opportunity to operate at more efficient economies of scale, and if they can be the primary beneficiaries of their management skills.

The farmer designs a business plan and manages the operation in a way that is consistent with the strategic plan accepted by the bank. The plan is also designed so that the flexibility of the farmer is preserved and the farmer has full management latitude. The investor deposits funds with an investment institution that trades with many investors, preserving investor liquidity. The actions of one investor who unexpectedly withdraws from the market will not significantly affect the market. Before contracting, the investor knows the degree of liquidity for the investment and the penalty for early withdrawals to meet unexpected liquidity requirements.

Under this PLSEM arrangement, the investor and the farmer each claim shares of the remaining equity in case of business failure or bankruptcy, depending on their respective equity positions. The issues of double taxation are avoided because the farm organization is not a corporation. The tax advantages are passed directly to the investment institution, increasing the after-tax returns on its portfolio of PLSEM investments.

The farmer receives a management fee for his services of managing the farm operation according to the accepted business plan. He also receives compensation for unpaid operator labor. This could be handled as either a specified wage rate or a set salary, depending upon the farm situation. If the farmer withdraws from the business more for family living than the agreed upon management fee and labor salary, this additional withdrawal would be considered a decrease in the farmer's share of contributed capital on the balance sheet. Conversely, if the farmer did not withdraw the total amount of allowance for management services and operator labor, the remainder would be credited as a capital contribution to the farmer's percent of the equity in the operation.

Historically a major barrier to external investment in farm firms has been the lack of standardized accounting and record keeping, creating a condition where monitoring costs were prohibitive. In certain equity arrangements, the farm operator has incentives to deceive the investor. Monitoring the financial statements regularly as specified in the contract is necessary to avoid investor losses. Monitoring costs can differ between contracts depending on the ownership agreements.[16]

Farm Accounting and External Equity

This section outlines the accounting practices necessary to properly account for external equity as described above. It is assumed that the farm would follow the FFSTF recommendations.[15] Departures from those statements and procedures are noted here.

There are costs associated with using external equity capital. The cost of using external equity would include search and information costs, contracting expenses, and the administrative and monitoring costs that the investment institution would require for their profit before entering into a contractual agreement with the farmer. For analytical ease, we assume that the transaction costs paid to the bank are a percentage of external equity. This implies that the expenses from using external equity depend on the amount of external equity the firm elects to use. The salary or fee paid to the farmer to manage the operations of the farm is another expense to the farm operation when using external equity. This management fee is calculated as a percentage of the value of farm production.

To account properly for external equity in a farm operation, the standard financial statements would need some minor modifications. These modifications arise because it is necessary to correctly identify the return on equity. The returns on equity can then be divided between the internal and external equity holders according to their respective ownership percentages.

The FFSTF recommendations recognize that net farm income (NFI) is the return to operator and unpaid family labor, management, and equity capital. To identify the returns on equity in the PLSEM arrangement, it is necessary to account for the returns to management and operator labor. Therefore, an expense line is added to the income statement to subtract the external equity transaction costs from pretax income in the same way that interest expense is subtracted. Also, an expense line is added to subtract the management fee paid to the farmer from pretax income. Further, the prearranged operator labor expenses are subtracted. Thus, the remaining value for NFI on the PLSEM income statement is only the return on equity.

On the balance sheet and on the statement of owner equity, total equity is subdivided into farm owner equity and external equity ownership. Both the absolute amounts and the percentages of total ownership are reported on these statements. Similarly, the distribution of retained earnings, contributed capital, and capital distributions between the two equity holders are reported.

In general, NFI is calculated by matching revenues with expenses incurred to create those revenues (NFI from operations), plus the gain or loss on the sale of farm capital assets. The rate of return on assets is calculated as:

$$(\text{NFI from operations} + \text{farm interest expense} + \text{transaction costs for using external equity})/(\text{average total farm assets}).$$

Farm interest expense and the transaction costs for using external equity are expenses subtracted out when calculating NFI from operations. They are added back in the above expression because they are returns on the assets that need to be accounted for in properly calculating the rate of return on assets. Interest is a return on the assets financed with debt, and transaction costs are a return on the assets financed with external equity. Note that for the rate of return on assets as calculated here to be completely consistent with the FFSTF recommendations, the management fee and operator labor expense would need to be added back as well.

The rate of return on farm equity is the return on the equity capital employed in the farm busi-

ness. For making comparisons between farms, it is more meaningful to use the market value approach to value farm assets and to include deferred taxes in the liabilities. The cost approach is the preferred farm asset valuation method when comparisons are made between periods for the same farm. The rate of return on owner equity is calculated as:

$$\text{(NFI from operations + transaction costs for using external equity)/(average total farm equity)}.$$

Table I is a schedule for calculating the equity division of owner and external equity. There are six main sections in this table, each associated with the standard financial statements. The equity at the beginning of the period is listed in section I and is also listed on the balance sheet at the beginning of the period. In section II, the net income as defined above, or retained earnings from the farm's income statement is divided between the two equity holders according to their respective percentages of ownership. Section III accounts for the division of unrealized capital gains between the two equity holders. Capital contributions are accounted for in section IV, and capital distributions in section V. In section VI, the ending equity position is shown and the percentage of equity ownership is calculated. The ending equity and ownership percentages are reported on the ending period balance sheet and on the statement of owner's equity.

There are also five columns in Table I. Column A contains the base amount for each category. Column B reports the percent of ownership. Column C totals the owner equity. Column D totals the external equity and column E totals the firm equity.

To illustrate how one would use this table, assume that total equity was listed at $500,000 on the balance sheet at the beginning of the year. This would be the beginning period base amount that goes in column A, lines Ia and Ib. Further assume that the farmer contributes 75% of the equity and the external investor contributes 25%. In this table, 75% would go in the B column of line Ia, and 25% is listed in the B column of line Ib. To calculate the amount of owner equity for line

Ia, multiply the base amount in column A by the farmer's percent of ownership in column B. This amount is then recorded in column C. To calculate the amount of ownership for the external equity holder, multiply the base amount in column A by the percentage amount of ownership in column B to get the dollar amount in column D. The totals for section I are tallied in column E.

The net income from the farm's income statement is divided between the two equity holders in section II, according to their respective percentages of ownership. This procedure is the same as in section I. The base amount for column A, lines IIa and IIb, is the NFI amount from the income statement. The percentages of ownership for column B are the same as in section I. The amounts for columns C and D are calculated by multiplying the base amount by the respective percentage. The total net income for the firm is shown in column E.

The division of any change in unrealized capital gains between the equity holders is calculated in section III of the equity schedule. The base unrealized capital gain comes from a supplementary schedule that accounts for the gains and losses of capital assets. In section IV, the capital contributions are tallied, and in section V the capital distributions are tabulated. There are no capital contributions in this example. We assume that the farmer reinvests in the farm all of the retained earnings credited to the farmer in section II. If there were infusions of capital besides retained earnings they would be shown in section IV. Further we assume that the external equity holder is paid their respective share of the income at the end of the year, and this income is shown as a capital distribution in line Vb.

The amount of total equity and the new percentages of ownership for the two equity holders is calculated in section VI. The total amounts are found by summing the section categories in columns C and D. Column C line VIa gives the total owner equity at the end of the period; column D line VIb gives the amount of external equity at the end of the period. Column E line VIc reports the firm total for the period end. These two new percentages and total equity are shown on the ending balance sheet and the firm's statement of owner's equity. These amounts and percentages would then

Table I. Supplementary Schedule Demonstrating Division of Equity Ownership: Operating Profit and Unrealized Capital Gain.

	A. Base ($000)	B. %	C. Owner ($000)	D. External ($000)	E. Total ($000)
I. Equity (Beginning of Period)					
a. Farm Owner Equity	500	0.75	375		375
b. External Equity Holder	500	0.25		125	125
c. Total Owner and External Equity					500
II. Net Income (Loss)					
a. Farm Owner	100	0.75	75		75
b. External Equity Holder	100	0.25		25	25
c. Total Net Income					100
III. Unrealized Capital Gain (Loss)					
a. Farm Owner	50	0.75	37.5		37.5
b. External Equity Holder	50	0.25		12.5	12.5
c. Total Unrealized Capital Gains					50
IV. Capital Contributions					
a. Farm Owner	0	0	0		0
b. External Equity Holder	0	0		0	0
c. Total Capital Contribution					0
V. Capital Distributions					
a. Farm Owner	0	0	0		0
b. External Equity Holder	-25	1.0		-25	-25
c. Total Capital Distributions					-25
VI. Equity (End of Period)					
a. Farm Owner		0.78[a]	487.50[c]		487.50
b. External Equity Holder		0.22[b]		137.50[d]	137.50
c. Total Owner Equity		1.0			625

[a] VIa.E/VIc.E.
[b] VIb.E/VIc.E.
[c] I.C. + II.C + III.C + IV.C + V.C.
[d] I.D. + II.D + III.D + IV.D + V.D.

Table II. Supplementary Schedule Demonstrating Division of Equity Ownership: Operating Loss and Unrealized Capital Gain.

	A. Base ($000)	B. %	C. Owner ($000)	D. External ($000)	E. Total ($000)
I. Equity (Beginning of Period)					
a. Farm Owner Equity	500	0.75	375		375
b. External Equity Holder	500	0.25		125	125
c. Total Owner and External Equity					500
II. Net Income (Loss)					
a. Farm Owner	-25	0.75	-18.75		-18.75
b. External Equity Holder	-25	0.25		-6.25	-6.25
c. Total Net Income					-25
III. Unrealized Capital Gain (Loss)					
a. Farm Owner	50	0.75	37.5		37.5
b. External Equity Holder	50	0.25		12.5	12.5
c. Total Unrealized Capital Gains					50
IV. Capital Contributions					
a. Farm Owner	0	0	0		0
b. External Equity Holder	0	0		0	0
c. Total Capital Contribution					0
V. Capital Distributions					
a. Farm Owner	0	0	0		0
b. External Equity Holder	0	0		0	0
c. Total Capital Distributions					0
VI. Equity (End of Period)					
a. Farm Owner		0.75[a]	393.75[c]		393.75
b. External Equity Holder		0.25[b]		131.25[d]	131.25
c. Total Owner Equity		1.0			525

[a] VIa.E/VIc.E.
[b] Vib.E/VIc.E.
[c] I.C. + II.C + III.C + IV.C + V.C.
[d] I.D. + II.D + III.D + IV.D + V.D.

be used as the beginning base amount and ownership percentages of section I for the subsequent accounting period.

In this example, the farmers percent of ownership increased from 75 to 78% because the external equity holder withdrew its net income. The external equity holder's absolute equity increased from $125,000 to $137,500 because of unrealized capital appreciation. Table II shows the impact on equity when there is the same capital appreciation, but an operating loss. The percentages of ownership do not change, but the amount of ending equity does.

Conclusion

Currently there are agricultural syndications and other investment institutions that function to provide external equity to selected agricultural enterprises such as cattle feedings, vineyards, citrus, nuts, and poultry.[3] However, they have been limited in their approach and availability to general production agriculture mainly due to the barriers mentioned previously. This article presents a potential contractual and institutional arrangement where external equity could be used with debt and owner equity to finance a farm business.

The framework outlined in this article is not enterprise specific, nor is it institution specific.

Given the opportunity to function in a PLSEM environment, any investment institution, whether it is a mutual fund, commercial bank, insurance company, or government sponsored institution like the Farm Credit System (FCS), could function as the investment institution. There are some logical reasons to believe that an institution such as the FCS would be at an advantage over other investment institutions. The FCS has in place the physical system necessary to make the options available in all areas of the country. They would be able to geographically diversify their investments optimally to protect against regional losses. Further, they have the technical expertise necessary to audit and monitor the progress and accounting of the farms that have signed on to participate in the PLSEM equity program. The FCS could attract outside funds from investment banks looking to invest in agriculture as a diversified investment in rounding out their own investment portfolios.

Starting an agricultural PLSEM may require government financial backing. However, such a market has the potential of reducing financial risk in agriculture resulting in potential reduction in farm program costs. Obviously, there are regulatory changes that would need to be adopted before the PLSEM market could function as outlined here. A listing of these changes would be the next logical step for further research.

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