



A Coordinated Farm Risk Management Safety Net
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Introduction: This paper develops a coordinated framework for a farm risk management safety net based on economic principles and current safety net programs and issues.

Framework of Current Discussions: Many current farm risk management safety net issues concern (1) the size of the farm loss and/or (2) the cause of the farm loss. Each of these two issues can be divided into two dimensions, resulting in a 2-by-2 matrix:

| | — Cause of Loss — | |
|--------------|----------------------------------|---------------------------|
| Size of Loss | Idiosyncratic (farm specific) | Systemic (large scale) |
| Shallow | | |
| Deep | | |

While no standard division exists between a shallow loss and a deep loss, a commonly-used division point is 15%. It is the smallest crop insurance deductible a farmer can elect when insuring an individual farm unit. A key reason for the debate over shallow vs. deep losses is that their relative importance differs across the U.S. This difference can be illustrated using farm level data from the Illinois and Kansas farm management associations. Average loss and variability of loss are notably greater for Kansas corn, soybeans, sorghum, and wheat than for the Illinois crops; especially corn and soybeans (see Table 1). More importantly, for corn and soybeans, over 70% of all losses incurred by Illinois farms were associated with losses that were 15% or less on individual farms. In contrast, for Kansas soybeans, sorghum, and wheat, losses on individual farms of 15% or less accounted for less than 50% of all losses. The implication is that the current crop insurance program offers more risk protection for Kansas than Illinois farms. Stated more broadly, the effectiveness of crop insurance as a risk management tool varies across the U.S.

Table 1. Crop Losses, Illinois and Kansas Farm Management Association Farms, 1978-2008¹

| State and Crop | Average Loss | Standard Deviation of Loss | Share of All Loss that is Losses of 15% or less |
|-------------------|--------------|----------------------------|---|
| Illinois Corn | 12% | 16% | 73% |
| Illinois Soybeans | 15% | 11% | 70% |
| Illinois Wheat | 22% | 16% | 56% |
| Kansas Corn | 24% | 21% | 57% |
| Kansas Sorghum | 29% | 21% | 47% |
| Kansas Soybeans | 31% | 22% | 45% |
| Kansas Wheat | 28% | 23% | 43% |

¹ NOTE: Farm Loss is calculated using this formula: [(plant insurance price times 5-year average of past yield times planted acres) minus (harvest insurance price times planted yield times planted acres)].
 SOURCE: Original calculations using data from the Illinois Farm Business Farm Management program, the Kansas Farm Management Association, and the U.S. Department of Agriculture, National Agricultural Statistical Service.

The cause of a farm's loss can be divided into (1) idiosyncratic or specific to the individual farm or a small number of farms and (2) systemic or common to a large number of farms. The cause has important implications. Idiosyncratic losses can be addressed by unsubsidized private insurance. Examples are fire and hail insurance for farming and, more broadly, car insurance. In contrast, systemic losses can cause private insurance to fail. Because systemic losses affect a large number, they potentially generate large insurance payments that can bankrupt private insurance companies.

The farm level data from the Illinois and Kansas Farm Management Associations can be used to examine the role of systemic revenue loss between planting and harvest. A key issue is the geographical area used to define systemic loss. Three commonly-discussed areas are evaluated: county, state, and U.S. As expected, for both states, the role of systemic loss increases as the size of the systemic area declines. In addition, for both states, the role of systemic loss varies by size of loss: systemic loss is more prevalent at shallow than at deep losses. Contrary to conventional thinking, the role of systemic loss is not always higher for Illinois. Specifically, when measured at the county, the role of systemic loss is greater for Kansas at deep losses and especially at the deepest losses. At shallow losses, the role of county systemic loss is nearly the same in the two states.

Table 2. Share of Farm Crop Loss Systemic with County, State, and U.S. Loss, Selected Loss Levels, Illinois and Kansas Farm Management Association Farms, 1978-2008

| State by Loss Level | ----- Share of Farm Loss Systemic with ² ----- | | |
|---------------------------------------|---|------------|-----------|
| | County Loss | State Loss | U.S. Loss |
| Illinois Corn, Soybeans, Wheat | | | |
| Losses of 0% - 15% | 73% | 65% | 58% |
| Losses > 15% | 46% | 24% | 21% |
| Losses > 25% | 31% | 8% | 13% |
| Losses > 35% | 15% | 1% | 0% |
| Kansas Corn, Sorghum, Soybeans, Wheat | | | |
| Losses of 0% - 15% | 70% | 57% | 48% |
| Losses > 15% | 52% | 21% | 9% |
| Losses > 25% | 47% | 12% | 3% |
| Losses > 35% | 42% | 6% | 0% |

Consistent with the sizeable role of systemic risk in farming, historical experiences from the U.S. and around the world reveal that, except for fire and hail insurance, private insurance for crop production and revenue losses is sustainable only when public subsidies are provided³.

Last, history reveals that two types of systemic loss are important in U.S. farm policy. One is a shortfall in production that occurs between planting and harvest over a large area (see Table 2). The usual cause is weather. The second type is large sector-wide revenue declines that last multiple years. The usual cause is a large decline in demand resulting from changes in policy or macroeconomic conditions. A recent example is the Asian financial crisis of the late 1990s.

² NOTES: (1) Per acre loss for farm/county/state/U.S. is calculated using this formula: [(plant insurance price times 5-year average of past yield of farm/county/state/U.S. times coverage level (85%, 75%, or 65%)) minus (harvest insurance price times yield of farm/county/state/U.S.)]. (2) Farm yields are per planted acre while county/state/U.S. yields are per harvested acre.

SOURCES: same as for Table 1.

³ (a) Wright, B.D. and J.A. Hewitt, 1994, "All-Risk Crop Insurance: Lessons from Theory and Experience," *Economics of Agricultural Crop Insurance: Theory and Evidence*, edited by Darrell L. Hueth and William H. Furtan, Kluwer Academic Publishers: Boston, pages 73 – 112. (b) Tweeten, L. and C. Zulauf, Fall/Winter 1997, "Public Policy for Agriculture after Commodity Programs," *Review of Agricultural Economics*, Volume 19, number 2, pages 263-280.

Placing Current Farm Risk Management Programs in the Farm Loss Framework

| | Cause of Single-Year Production Loss | | Large Multiple-Year Revenue Declines |
|--------------|--|--|--------------------------------------|
| Size of Loss | Idiosyncratic (farm specific) | Systemic (large scale) | Systemic (large scale) |
| Shallow | SURE (if buy 80/85% individual insurance) | ACRE SURE (if buy 80/85% individual insurance) | ACRE |
| Deep | INSURANCE SURE (if buy 75% or less individual insurance) | ACRE: up to 25% cap INSURANCE SURE (if buy 75% or less individual insurance) | ACRE: up to 25% cap |

Reflecting the discussion at the bottom of page 2, two systemic losses are included in the farm loss framework: (1) production losses for a single year and (2) losses associated with a large multiple-year decline in revenue. ACRE, crop insurance, and SURE are placed in the framework. The marketing loan and price counter-cyclical programs can provide assistance for multiple-year losses while the counter-cyclical program can provide assistance for single-year production losses. However, unlike the other three programs, counter-cyclical supports are fixed by Congress for the length of the farm bill and thus do not vary with the market. Moreover, a farm loss is not required to receive a payment. Thus, the marketing loan and counter-cyclical programs have more of an income support function than a loss assistance function.

Insurance and SURE both address single-year deep idiosyncratic and deep systemic production loss. ACRE addresses single-year deep systemic loss up to the 25% cap on its payments. SURE addresses single-year idiosyncratic and systemic shallow loss while ACRE addresses single-year systemic shallow loss⁴.

While the loss profile overlaps between SURE and the other two programs, double payments are not made for the same loss because ACRE and insurance payments are included when calculating SURE payments. Both ACRE and insurance can make payments for the same deep systemic loss. However, the overlap is limited to systemic, not all, loss and is limited by the 25% cap on ACRE payments. Thus, payments from ACRE and insurance that cover the same loss are smaller than it appears. Zulauf, Schnitkey, and Langemeir estimate that this overlap between ACRE and the commonly-bought 75% Crop Revenue Coverage insurance is less than 5% of all ACRE payments⁵.

Another interaction is that SURE may compliment or compete with insurance. SURE in essence increases crop insurance coverage by 15% at no cost. On the one hand, SURE encourages higher insurance coverage because the 15% add on provides more additional free coverage the higher the level of insurance bought. On the other hand, SURE allows a given target coverage level to be attained by combining a lower insurance coverage level and the 15% SURE add on.

ACRE is the only one of these three programs that addresses losses associated with revenue declines that last multiple years. This loss is always systemic as the entire farm sector is affected.

⁴ Another distinction is that ACRE and insurance provide assistance on a crop-by-crop basis while SURE's insurance unit is essentially all crop acres on the entire farm operation.

⁵ Zulauf, Carl, Gary Schnitkey, and Michael Langemeir, "ACRE, Crop Insurance, and SURE: Interactions and Overlap for U.S. Midwest Crops," *Journal of Agricultural and Applied Economics*, Volume 42, Number 3, 2010: 695-700.

A Farm Loss Partnership

| | — Cause of Loss — | |
|--------------|-------------------------------|--|
| Size of Loss | Idiosyncratic (farm specific) | Systemic (large scale) |
| Small | Deductible | Deductible |
| Shallow | Farmer / Share Rent Landlord | Area and Multiple-Year Systemic Loss Program |
| Deep | Insurance | |

Four observations provide the foundation for a farm safety net based on a farm loss partnership:

- (1) It is generally accepted that insurance often causes the insured to behave in a more risky manner, leading to inefficient use of resources. To mitigate this response, it is important that the insured be responsible for managing at least part of the risk. This is one reason insurance products have deductibles. The same logic applies to the farm safety net.
- (2) The economic crop insurance problem is systemic loss, not all loss. Thus, public policy should be directed toward systemic loss, the loss that can cause private insurance to fail.
- (3) The role of idiosyncratic and systemic loss varies by the size of loss. At larger losses, loss becomes more idiosyncratic.
- (4) The size of farm loss and relative roles of shallow and deep farm loss vary across states.

Reflecting these four observations, a farm loss partnership could be composed of:

- (1) a deductible amount for small losses,
- (2) a program to address shallow systemic losses, and
- (3) a crop insurance program to address deep losses.

Unless coverage level and other parameters are customized to different states, crop insurance cannot provide comparable risk management assistance across states. The reason is the different roles of shallow and deep loss across states. Moreover, the history of public policy in the U.S. suggest that, if crop insurance provides different products by state, those who see themselves as disadvantage will argue for increased coverage at no cost to them. Thus, increasing program cost is nearly inevitable when a differentiated program exists. Given these considerations, the appropriate public policy response is to create different programs that address the different types of farm loss but to coordinate them to minimize cost⁶. Thus, two programs are proposed instead of one program.

A key question is what area should be used to define systemic losses. Commonly-cited options are the county, crop reporting district, state, and U.S. Economics provides no clear answer since trade-offs exist. As the systemic area decreases in size, a systemic loss program provides more loss assistance to individual farmers. However, program cost increases, overlap with crop insurance becomes more of issue, and production is encouraged in more risky areas, which often are environmentally sensitive areas. Last, for a loss assistance program to be fair and effective, reliable data are critical. The recent decision by the Risk Management Agency to eliminate group insurance products from numerous counties highlights the importance of this issue.

⁶ To address large multiple-year declines in revenue, it has been proposed that insurance use the higher of two assistance levels: (1) one calculated for the current crop and (2) a second that defines when multiple-year revenue declines occur. However, this proposal does not address the important issue of the different roles across states of shallow vs. deep losses. Moreover, the proposal increases the probability that a farmer will be able to insure a profit, notably when the multiple-year assistance level is higher. Insuring a profit is generally considered to be undesirable because it encourages risky behavior.

Proposed Coordinated Farm Safety Net: Single Shallow Loss Program

| | | ----- Cause of Loss ----- | |
|--------------|--|---------------------------|--|
| Size of Loss | Idiosyncratic (farm specific) | Systemic (large scale) | |
| Small | Deductible | | |
| Shallow | Option 1: Area Systemic Loss Program with insurance wrap-around product Option 2: Farm Level Program with payment rate = % of loss that is systemic | | |
| Deep | Insurance (subsidy = % of deep loss that is systemic) | | |

A loss program's deductible, coverage level, and cap on per acre payment are interrelated issues.

- (1) Frequently-discussed options for the deductible (i.e., small loss) are 5% and 10%. The smaller the deductible the higher the level of loss assistance and program cost. It is worth noting that, among current farm risk management programs, 10% is the smallest deductible (ACRE, SURE, and group crop insurance). This observation suggests public policy has found a 10% deductible reasonable and acceptable, at least historically.
- (2) A cap on the shallow loss payment per acre can minimize overlap with insurance and limit the opportunity to insure a profit. Caps of 10% and 15% seem like reasonable alternatives. They result in a combined insured level of less than 100% of a farm's expected revenue with 85% and 80% individual insurance, respectively. Historically, relatively few individual crop insurance policies are sold with 85% coverage.

The shallow loss program could replace both ACRE and SURE. Two alternatives exist. One is an area shallow loss program. The considerations in choosing the geographical area are discussed at the bottom of the previous page. The second alternative is a farm level program with its payment rate set equal to the share of loss that is systemic over the range of losses covered by the shallow loss program. Such a payment rate is consistent with systemic loss, not all farm loss, causing the public policy problem of failed private insurance markets.

A farm unit must be chosen. The likely options are individual crop and whole crop farm. Tradeoffs exist. A whole crop farm unit is likely to be cheaper since high income from one crop can offset low income from other crops. However, because multiple crops stabilize revenue, a whole farm unit provides the most assistance to monoculture (single-crop) farms and thus encourages farmers to move away from the traditional loss management strategy of crop diversification.

To provide assistance against multiple-year revenue declines, a reasonable option for calculating the assistance level for the shallow loss program is a 5-year Olympic moving average of revenue, with no caps and cups. This formula is simple and avoids separate calculations for yield and price. It also likely reduces program cost because it accounts for the correlation between price and yield.

It is conceptually feasible that a wrap-around private insurance product could be developed to compliment an area shallow loss program. This wrap-around product would cover the loss of an individual farmer that exceeds the area's shallow loss. Because this wrap-around program addresses farm specific losses, no public subsidy should be needed.

Consistent with systemic loss being the public policy issue, the public subsidy rate for crop insurance should not exceed the share of farm crop loss that is systemic. Using the farm data from the Illinois and Kansas Farm Management Associations and the county as the measure of systemic loss, the average share of farm loss systemic with county loss is 50%, 41%, and 30% for farm losses greater than 15%, 25%, and 35%, respectively. These shares are less than the current subsidy rates of 53%, 77%, and 80% for enterprise insurance with a 15%, 25%, and 35% deductible.