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Costs and Benefits of Livestock Gross Margin for Dairy Cattle, and Implications for the Dairy Producer Margin Protection Plan

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Introduction

Livestock Gross Margin for Dairy Cattle – LGM-D – is a Congressionally authorized dairy margin insurance product that became available to dairy farmers in August 2008 on a pilot or trial basis.¹ It is one of a suite of risk management products for livestock producers that were developed by a company called Iowa Agricultural Insurance Innovations LLC and are sold by private insurance agents approved by the Risk Management Agency of USDA.² The USDA Federal Crop Insurance Corporation (FCIC) functions as the reinsurance agency for the private companies who deliver the product to producers. RMA establishes rules the private insurers must follow because the program is offered under the purview of a government mandate and is therefore subject to additional regulation. This is essentially the same process followed for crop insurance.³

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¹ The core Federal Crop Insurance Act was amended by the Agricultural Risk Protection Act of 2000 to give RMA the authority to offer livestock risk protection insurances on a pilot basis.

² <http://www.rma.usda.gov/livestock/>

³ The remainder of this paper assumes that the reader is familiar with the basic design and operation of LGM-D. There are other sources of information about LGM-D. RMA provides detailed information on how the program works and some basic descriptive information. Two university-based dairy economists have devoted a considerable amount of time and effort to providing descriptive information and applicable tools for dairy producers who might be interested in LGM-D. These are Dr. Brian Gould at the University of Wisconsin and Dr. Cameron Thraen at The Ohio State University. Dr. Gould's website is located here: http://future.aae.wisc.edu/lgm_dairy.html A helpful presentation by Dr. Thraen is located here: http://aede.ag.ohio-state.edu/programs/OhioDairy/leafs/LGM_Dairy_Basics.pdf

The basic design of LGM-D, as its name implies, is to provide insurance coverage against actual losses relative to an insured level of a margin between the price of milk and the cost of certain feeds used to produce milk. It is a type of dairy margin insurance. The feed component can be held to zero, in which case it becomes milk price insurance.

In 2010, the National Milk Producers Federation developed and promoted a new kind of margin insurance plan that was in many ways inspired by LGM-D but also sought to correct what NMPF believed were limitations with the existing product. The new plan was labeled Dairy Producer Margin Protection Plan or DPMPP. This plan was embraced by Congressman Collin Peterson, the Ranking Democrat on the House Committee on Agriculture, and introduced as a major part of a new dairy policy proposal he called the Dairy Security Act. Since its introduction last summer, this plan has become part of the larger Farm Bill discussion. The new omnibus bill for agriculture, food and related programs under USDA's purview is expected in 2012 or 2013. Some studies and analysts have tried to estimate the potential effects of this and other elements of the NMPF plan.⁴ This paper is much less ambitious. The purpose here is to draw some comparisons and raise questions that may be worth further analysis or thought.

Since its inception in 2008, almost 3000 LGM-D contracts have been sold, with the vast majority sold in the last 2 years. By the nature of this program, the contracts have been for a broad range of coverages over a wide range of premiums. Information about the costs and benefits of LGM-D can tell us something useful about this program, which, under the current proposal, would still be available if the DPMPP is passed. In addition, information about LGM-D may provide insights into the demand of dairy farmers for risk protection – i.e., what price they are willing to pay for different levels of margin protection. And, LGM-D may tell us something useful about what we can expect for the cost of an alternative margin protection plan.

The LGM-D Track Record

The location of data on LGM-D is not particularly easy to find. RMA has a web tool that provides basic sign up data for all of its insurance products. The link to that website is as follows: <http://www3.rma.usda.gov/apps/sob/>. Data can be sorted for different livestock risk products, different years, and by state.

Participation by Dairy Farmers

The initial roll out in 2008 was only for 30 states. It didn't ramp up to 48 states until July 2010.

⁴ Among the more sophisticated studies of this plan, in one variation or another, are the October 2011 reports written by Drs. Charles Nicholson at the California Polytechnic State University at San Luis Obispo and Mark Stephenson at the University of Wisconsin, as reported on the UW website: <http://dairy.wisc.edu/PubPod/> Dr. Scott Brown at the University of Missouri has also published a study of the NMPF plan, but the focus of his paper was on the Dairy Market Stabilization Plan, not the DPMPP.

Prior to December 2010, farmers paid the full value of a premium that was calculated each month in a manner intended to be “actuarially fair”. From August 2008 through November 2010 (16 months), farmers in eligible states could execute an LGM-D contract in any or all months. Farmers could elect coverage on 1 to 10- months of their milk production. Thus, a contract initiated in November 2010 could have covered milk starting in January 2011 and going as far out as October 2011.

In December 2010, USDA began subsidizing premiums using a special appropriation that is designed to support any or all livestock risk insurances offered through RMA. This appropriation had existed before; it just had not been allocated to LGM-D. These subsidies proved to be quite popular, and they came at a time when producer interest was piqued by the disastrous period of early 2009, and the weak period that extended well into 2010. The downside of these subsidies was that once this limited pot of funds was exhausted, no more contracts could be sold. From USDA’s perspective on how funds are allocated and used, farmers could not go back to paying the full premiums even if they wanted to.⁵ The whole program had to be deactivated for the remainder of the fiscal year. Contracts were offered from December 2010 through March 2011 (4 months).

The subsidy program was revived with the new federal fiscal year in October 2011, but there was only enough funding this time to support 2 months of sign up. Again, keep in mind that the number of months of milk production that can be covered is greater than the number of months one could sign up.

The level of the subsidy varied with the deductible chosen by the producer and when all, or more, months are insured together. Knowledgeable sources suggest that the average or most common deductible chosen by producers was about \$1 per cwt. Apparently many farmers viewed this level of deductible as having the most favorable balance between the amount of premium they paid and the amount the government covered. Actual premiums paid and coverages chosen by individual farms are not public information.

Thus, over the last three years, the program has been constrained by the number of eligible states in the beginning and the number of eligible signup months more recently. For the 50 months from August 2008 through September 2012, the number of months a producer could execute a contract is 22. Given that farmers could elect coverage periods from 1 to 10 months, it is a little hard to precisely characterize the financial characteristics of the months for which a producer could buy insurance. However, we can say that 20 of the 22 months during which a producer could buy coverage were among the worst margin performance months for dairy farmers in the last 80 years.

So, what do we know about participation? The bottom line is that prior to the USDA subsidy, the amount of milk covered relative to eligible milk was less than 1%. Since the subsidy program was implemented, this has bumped up to about 2.5%. Premiums were paid on about 2,300 policies. We don't know how many unique farmers this represents. The

⁵ *The issue for USDA was that they lacked sufficient or appropriate funds to pay insurers for the Administrative and Operating fees that would be required even if farmers had purchased contracts without any premium subsidies.*

same farmer could have had four policies corresponding to the four fiscal years the program has spanned. At the outside, if each policy is a different farmer this amounts to less than 4% of all dairy farmers. The actual percentage of farmers is certainly less than that. A single policy can cover more than one contract or “unit”, in a given year. The number of units sold is close to 3,000.

Premiums

“Actuarially fair” premiums means that the premiums are intended to be set according to a methodology designed to result in total premiums paid over a long period that equal the total cost of indemnities paid out plus reasonable administrative costs. In the case of RMA approved products, the Administrative and Operating (A&O) costs of a private insurer are actually paid separately. USDA directly reimburses insurers for A&O costs, following a complex set of rules about what costs are allowed. Thus, the total cost of RMA insurance is the premium plus the direct payment for A&O. For LGM-D, the A&O costs are in the vicinity of 20% of the total premium.

In any one year, premium revenue can exceed indemnities. This is referred to as an underwriting gain. If indemnities exceed premiums in a given year there is an underwriting loss. As with all other forms of insurance, insurers build a reserve from underwriting gains to cover large losses that will occur from time to time. USDA is further required to add 3% to this “actuarially fair” premium that is calculated each month for each contract for the purpose of building a reserve.

The premium changes every month. The changes are driven by the CME futures contract prices for Class III milk, corn and soybean meal that are the basis for determining eligible coverage amounts, potential liabilities, and indemnity payments, should there be any. Premiums will also depend on the specific coverages chosen by the producer and deductibles that can be elected by the producer in 10 cent/cwt increments up to \$2 per cwt. Different producers who chose exactly the same coverage in the same month will pay the same premium, but the same coverage in terms of volume of milk or amount of feed will have different premiums for different coverage periods and sign up dates. Basically, as the potential chance of a payment or the amount of the payment increases, the premium will be higher. This is similar to the differences in auto insurance premiums in New York City vs. rural New York State, or for a BMW instead of a Chevy, or the premium with a \$500 deductible instead of a \$1000 deductible.

Premiums vs. Indemnities

So what is the net-net over the life of the program so far?

Since 2008, dairy farmers have paid \$25 million in premiums. The USDA subsidy is an additional \$20 million. Above and beyond this, USDA has paid about \$10 million directly to insurers for their administrative and operating costs (A&O). Thus, the total out-of-pocket cost of the program has been about \$55 million. Of this \$55 million, about \$1.3 million is retained by USDA as a legally required "reserve". In addition to the \$10 million that goes to insurers for administrative costs, another \$0.8 million or so was paid to the developers of the LGM-Dairy product. About \$1 million was paid to farmers in indemnities. This leaves a

little less than \$43 million of underwriting gain, i.e., excess premiums that are available to the insurer or USDA (the reinsurer) to cover future losses. These numbers are in the table below. Prof. Cameron Thraen has also discussed this situation in a recent paper.⁶

Livestock Gross Margin - Dairy Cattle, Selected Results from FY 2008 to FY 2012	
Number of Policies Written	3,393
Number of Policies Earning a Premium	2,302
Number of Units Earning a Premium	2,977
Pounds of Milk Covered by Units Earning a Premium	8,900,055,200
Total Premium	\$ 45,263,689
Farmer Paid Premium	\$ 24,591,831
USDA Paid Premium	\$ 19,614,135
USDA Paid A&O*	\$ 9,755,863
USDA Reserve*	\$ 1,357,911
IAII Fee*	\$ 755,904
Indemnities Paid to Farmers	\$ 1,057,723
Policies Receiving an Indemnity Payment	112
Units Receiving an Indemnity Payment	162
Underwriting Gain	\$ 43,450,062

* Estimated by the author.

Let's go back over that.

1. Participation by dairy farmers, even when the premium is heavily subsidized, is a very small percentage of total US milk marketing or of the total number of dairy farms.
2. Federal subsidies take participation from minuscule to tiny.
3. The total program cost is \$55 million, about half of which is paid by farmers.
4. Farmers get \$1 million in indemnities, with the rest going back to either insurance companies or USDA.

⁶ Cameron Thraen, LGM Dairy Premiums, Administration and Overhead, and Fees: Who Pays and Where Does the Money Go?, mimeo, Department of Agricultural, Environmental, and Development Economics, The Ohio State University, 9 September 2011.

Now, if this were the story for four of the best years ever for dairy farmers, then one could say, well, sure, there was a big underwriting gain, but we'll need that for when markets go really bad. Instead, this is the story for a short period dominated by the worst months for the dairy economy in living memory.

One might reasonably ask whether the actuarially fair premiums are actually fair. Is LGM-D too cheap for farmers because the program has to be terminated early in the year when it is subsidized, leaving a group of farmers willing to pay for more but unable to get it? Is LGM-D too expensive because almost no one buys it unless it is subsidized, and actually not very many people buy it even when over half the premium is paid by USDA? Is it too expensive because 96% of the total premium paid (farmer plus federal) is underwriting gain?

If one includes the separate payment for A&O and sets aside the payment to developers of the contract and the 3% USDA reserve, then we could say that 94% of the total cost of LGM-D has been retained as underwriting gain. Keep in mind that some of this money is the USDA premium subsidy payment. In one sense, USDA pays out subsidies with one hand, takes in a major chunk of the underwriting gain with another hand, and then declares that it ran out of subsidy money. While this sounds somewhat silly on the surface, it is well and fair to keep in mind that USDA plays by the established rules, the basic framework of which is defined in legislation. With the assumption that underwriting gain is truly needed as a reserve against future loss, then the subsidy should be thought of as contributing to that reserve.

How does this compare to Crop Insurance?

Crop insurance programs date as far back as the 1930s, but the extensive system we have today regained bloom in the 1980s, although the usage of crop insurance got off to a slow start. From the 1989 to 1994 crop years, six types of insurance products were sold. The number of policies sold each year was about 1 million, and total premiums paid totaled less than \$1 billion. Originally, programs were based on a concept of production or yield risk. Following the 1995 Farm Bill, new insurance products were developed based on the concept of revenue . . . combining yield risk with price risk. The types of policies offered tripled from CY1995 to CY2000, as did the number of policies sold. Total premiums paid rose steadily from less than \$1 billion in CY1994 to over \$11 billion in CY2011. In addition to developing a variety of new products, government subsidies paid to cover premium costs doubled as a percentage of total premiums paid to insurers. Over time, the subsidized share of total premiums has increased from 25% in the early 1990s to 62% now. The increase in subsidies represented in part an increase in total premiums, not just a displacement of producer paid premiums. This put crop insurance on a better actuarial footing and decreased the loss ratio from an unsustainable 130% to a more reasonable 80%. Today, USDA's Risk Management Agency (RMA) coordinates a couple dozen risk management products. These tools can be applied to some 100 crops or even whole farms. For more details, go to www.rma.usda.gov/policies/.

Gross revenue is gaining traction

In recent years, plans based on gross revenue have gained popularity over plans based on yield alone. Revenue plans make payments based on yield losses caused by natural causes, losses related to a harvest, or projected price.

There are six basic plans related to revenue insurance. Far and away the most popular is Revenue Protection (RP). About 80 percent of the 2011 crop insurance premiums paid were covered under the RP program.

Farmers can use a similar program called Group Risk Income Protection (GRIP). GRIP and its related variations represented about 4 percent of total 2011 premiums in 2011. GRIP typically has lower premiums because the “group” refers to the fact that its premiums and indemnities are calculated based on the farm’s home county. Recently, experts have calculated that RP is the better deal

In 2011, a year of record crop insurance payments, the indemnities paid under the RP program were \$7.9 billion against premiums of \$9.2 billion. In total, farmers paid 44 cents for every \$1 received in indemnities. No indemnities were paid under GRIP.

Of the several programs that offer insurance against yield or production losses, there are two that are widely used: the Yield Protection (YP) program and the Actual Production History (APH) program. They both relate to yield losses on the individual farm and represent 15 percent of total crop insurance premiums. The difference between them is the price used to determine the dollar value of the loss.

Under these two programs, 2.6 percent more was paid in indemnities than in total premiums. In other words, they had an underwriting loss in CY2011. All of this was due to the YP program, although the loss ratio was very high for the less popular APH program. The YP program collected 28 cents from farmers for every \$1 of indemnities paid, compared to 41 cents for the APH.

Two plans apply to livestock

Livestock programs can be categorized into two types. **Livestock Gross Margin**, as it applies to milk, combines an output price with feed prices to create a margin or gross returns over feed costs insurance. **Livestock Risk Protection** (LRP) only insures against output prices. There is no LRP-Dairy.⁷

In 2011, all livestock insurance products collected total premiums of \$34 million and paid indemnities of \$4 million. Across all livestock producers and all livestock insurance products (excluding dairy), USDA collected \$2 in premiums for every \$1 these farmers and ranchers received in indemnity payments. Compared to all livestock products, LGM-D accounted for 32% of the policy units in force and 73% of the total premiums charged. Dairy

⁷ Although there is no LRP-Dairy, per se, LGM-D allows farmers to cover different levels of feed use, beginning with none. In this case, LGM-D boils down to output price protection only, just as is the case with LRP.

farmers received 90 percent of the livestock subsidy but only got 1.4 percent of the livestock indemnities.

Insurance package for total farm revenue

Two other insurance programs, AGR and AGR-Lite, are based on individual farm gross revenue. They insure Schedule F of the IRS 1040 tax form, which most farm businesses utilize. In 2011, \$18 million in premiums were paid for these two programs, mostly AGR. Only \$55,000 was paid in indemnities . . . that was all under AGR-Lite. These programs are probably best suited for small farmers or those raising specialty crops.

Although these two products have not been very popular, they are the only programs that cover the whole farm enterprise. In that sense, they are a good deal more flexible for operations that have multiple crops.

Conceptually, this approach might also be well suited for dairy operations that grow much of their own feed or have cash sales from a variety of products but at a much smaller share of total revenue. Currently, these products are not well structured for most dairy applications. But they are perhaps an example of a good idea that just hasn't been structured in the best way yet.

Summary

For the fiscal years from 2008 to 2011, federal premium subsidies on all crop insurance have run about 60% of the total premium cost and the indemnities paid out represented about 57% in 2009 and 2010, 79% in 2011, and 88% in 2008. Thus, over these four years, crop insurance subsidies equal about 84% of the total indemnities paid, with the farmer contribution covering the rest. Even in very tough years, such as the 2011 and 2008 crop years, the underwriting gain was 12% to 21%. The gains in crop insurance pale in comparison to those experienced under LGM-Dairy.

Needless to say, these comparisons do not mean that the same relationships will necessarily apply in the future. Nevertheless, it is generally true that crop insurance is more heavily subsidized than livestock insurance, and the underwriting gains in crop insurance are lower than in livestock insurance.

Potential Implications for the Proposed Dairy Producer Margin Protection Plan

The Congressional Budget Office's (CBO) assessment of the Dairy Security Act introduced last summer suggests that this early version of the DPMPP could cost taxpayers an average of about \$70 million per year over a 10-year planning horizon. This expenditure would be for the \$4 per hundredweight (cwt.) base margin insurance and was assumed to cover 85 percent of the U.S. milk supply.

This is probably a lower protection level than what participating farmers purchased under LGM-D, but the level of coverages is not reported for LGM-D. On the other hand, the DPMPP analysis assumes that the proposed program applies to the vast majority of the milk supply as opposed to a tiny percentage covered in LGM-D.

For the sake of discussion, let's take a simple look at the premiums and indemnities paid under LGM-D and ramp them up in a very simplistic way to cover 85 percent of the milk supply instead of the actual 2.5 percent.

Based on data since 2008, \$45 million in premiums were collected over four years of LGM-D. In total, \$1 million in indemnities were paid on less than 2 percent of the milk marketed. If we extrapolate the exact same coverage and premiums for LGM-D to 85 percent of the milk supply, the premiums collected would have been about \$1.9 billion with indemnities of \$43 million paid to producers. This is a much higher cost than the CBO estimate of \$70 million. CBO doesn't report estimates of benefits received by farmers under the new margin plan. RMA doesn't report the range of margin coverage purchased by farmers. So, is LGM-D more expensive than DPMPP, or does it pay better, or some of both? These data only tantalize us. There is not enough detail to say more specifically. It would be awfully helpful to have more information about the CBO assumptions of expected benefits received for the cost that is calculated. For the program that exists and for which there are real data, it would be useful to compare amounts of coverage with payments made by farmers and actual government cost.

Nevertheless, this overly simple arithmetic does challenge us to step back. If the \$1.9 billion premium cost is plausible as a true and fair cost for covering that much of the milk supply, it also seems reasonable to think that it would have paid a lot more benefits than are projected for the \$4 base plan. Or, think about it this way, given that the actual LGM-D indemnities paid since August 2008 equate to \$10 million a year on 85 percent of the milk sold . . . then is the CBO projection of a \$70 million a year cost for the \$4 plan consistent with the cost experience under a similar plan that has actually been in effect?

Projecting potential premiums

The total premiums under LGM-D equal 51 cents per cwt. The originally proposed DPMPP would allow farmers to obtain \$7 margin insurance for 43.4 cents and \$7.50 protection for 59 cents per cwt. The subsidized LGM-D premiums charged to farmers in the last two years equates to 28 cents per cwt. This is a bit more than the 23 cents associated with a \$6.50 margin under the original DSA plan. It would be interesting to compare how much margin protection farmers purchased for those 51 cents of full cost or the 28 cents of subsidized cost versus the premiums planned for DPMPP

Whether the fixed margin insurance premiums will be higher or lower in a final bill remains to be seen. There is discussion of discounting premiums for smaller producers.

Please note, these calculations also exclude any administrative and operating cost (A&O), fees to those who developed each plan, or payments to a reserve fund. The costs are shifted in DPMPP because it would be administered by FSA (Farm Service Agency), not by private insurers through a reinsurance agreement offered by Risk Management Agency (RMA). Of course, there is an administrative and operating cost to running FSA, but it wouldn't be allocated to DPMPP. Also, as far as I know, National Milk Producers Federation hasn't asked for any royalties on their margin insurance idea.

Sign-up and Coverage Periods

LGM-D is, at least theoretically, available to farmers every month and has no cross-compliance requirements or entanglements. Signing up, or not signing up, does not obligate the producer to any other program or action. As proposed under the most recent draft of the Dairy Security Act, DPMPP has two contrasting differences. First, signing up for the DPMPP automatically makes the producer susceptible to the growth management provisions of the companion Dairy Market Stabilization Plan. The producer who foregoes the margin insurance plan is not subject to the requirements of DMSP. Second, farmers who wish to participate in the Base (\$4) component of DPMPP must 1) make that declaration when the program is first offered and 2) must stick with it through the life of the bill, presumably five years. Under the original version of the plan, farmers who wish to purchase additional coverage under the Supplemental Plan would declare their election at the same time and for the same duration. More recent proposals have suggested allowing producers to make a different election at the beginning of each year just for the Supplemental Plan.

There is nothing intrinsic to the DPMPP that necessitates that it be married to a growth management plan. Indeed, there have been proposals to advance a margin insurance plan as a standalone policy. Nonetheless, it has been packaged this way in the leading proposal, and this is another difference with how LGM-D is run.

There is also nothing essential about the periods over which one might sign up or cover milk production. Nevertheless, LGM-D allows farmers, each month, to cover milk production over 1-10 months, with the only proviso being that the coverage must be for continuous months. DPMPP has one initial sign-up, and basic coverage is fixed for the life of the Farm Bill. Supplemental coverage can be elected, or not, annually.

Better or worse?

Does all of this mean that the proposed margin insurance plan is better or worse than LGM-D? These simple, preliminary comparisons are intended to be thought provoking. However, they don't prove anything.

RMA calculates premiums on LGM-D using a very different methodology than the CBO. If the RMA's methodology were applied to DPMPP, it is a certainty that the cost estimate would come out very differently.

Running a program through FSA is clearly different than private insurance, in terms of service and cost. FSA's costs are buried in the overall cost structure of a sprawling government office system. Chances are the level of service available from FSA also would be quite different. The tradeoff between cost and service has been raised in connection with crop insurance for which we have a great deal of experience. Advocates of private insurers argue that service and product development are superior under a private system.

A different aspect of running a program through FSA versus a private insurer is how the money flows. When LGM-D premiums exceed indemnity payments and other costs, the underwriting gain is retained in part by the insurer and in part by the reinsurer (USDA's Federal Crop Insurance Corporation). Meanwhile, if FSA collects more premiums than it pays

out in indemnities, the money goes to the U.S. Treasury. By the same token, if indemnities exceed premiums in a given year, the U.S. Treasury would pay the difference.

In terms of coverage, DPMPP doesn't afford the producer as much flexibility when compared to LGM-D. This flexibility includes tailoring the coverage to the milk production and the amounts and types of feed. Also, DPMPP doesn't offer deductibles that bring down the premium cost, but it does offer different levels of margin protection at very different premiums, which has a similar affect. If LGM-D offers more flexibility and customization choices, then DPMPP is a simpler program for a producer to understand.

Each producer will have a different idea about the relative merits of the two programs. Keep in mind that the current dairy policy proposal does not replace LGM-D or require its elimination. It may seem odd or redundant to have both programs when they are so similar, but for now that seems to be the plan. In addition, let's not forget that entirely private risk management tools, including hedging, options, and forward contracting, will also remain available to all producers. Although it may take a while to wade through the options, dairy farmers will sort out fairly quickly which one makes the most sense to them.