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**FEDERAL CROP INSURANCE AND FARM PROGRAMS:
WILL WTO OR BUDGET CONCERNS SHAPE THE DEBATE?**

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As we move into a farm bill discussion in 2007, I have been asked to address the implications of the World Trade Organization (WTO) and budget concerns on the debate over commodity programs and the federal crop insurance program. If one asks whether WTO and budget considerations will influence the farm policy debate, the simple answer is “yes.” Both the WTO and the budget will profoundly influence the future direction of commodity programs and crop insurance.

WTO Implications

Let me turn first to the World Trade Organization (WTO). My remarks today will be predicated on the assumption that no further breakthroughs in negotiations will occur. Therefore, I will concentrate my remarks on the implications of the current agreement for the farm bill debate. First, the cotton case has demonstrated that the 2002 farm bill will not withstand challenge at the WTO. Consequently, modifications or new WTO-compliant programs are likely to be seriously considered. The WTO thrust to achieve decoupling has an objective of breaking the connection between our commodity programs and the incentive to produce. The intent is to increase the responsiveness of producers to market forces. However, this goal to a large extent runs contrary to government risk management policies designed to aid producers in managing the risks associated with agricultural production. In particular, the WTO language appears to suggest that to be compliant, a program must break the connection between the output, acreage, or prices associated with a crop. For the most part we must accept that WTO decoupling and effective risk management tools are contradictory concepts. Thus, we have a fairly clear policy trade-off between allocating program dollars to non-risk-responsive decoupled payments and amber box risk protection mechanisms.

As one looks at the options available to us in the upcoming farm bill debate, essentially the two best bets for WTO compliance appear to be either the current direct payment program with the fruit and vegetable restriction eliminated, or some type of whole-farm revenue guarantee with a 70 percent trigger that would subsume all enterprises, including crop and livestock revenue. In the case of the direct payment program, these payments are completely non-responsive to variations in cost, price, or production. The latter program, a whole-farm revenue guarantee incorporating multiple enterprises, would provide a relatively very low level of protection, would likely be complicated to implement, and therefore producers would not find it very attractive.

The Budget Situation

As we begin discussion of the 2007 farm bill, we have moved from an era of budget surpluses that existed when the 2002 farm bill was written to an era of budget deficits. We have also moved from a period of low prices to a period of very strong commodity prices for a number

¹ Thanks to J. Corey Miller and Debra Price for assistance with this paper.

of the program crops. What does this situation mean? Obviously it means a reduction in the baseline level of funding by which all alternative proposals will be judged—a situation reminiscent of the 1996 farm bill. When I hear of new price plateaus because the world has changed, I am reminded of the accuracy of such statements in 1996. In a remarkably short time we have been able to find a way to respond to market signals in agriculture, such that low prices reoccur much sooner than most expect. Thus, while I am somewhat pessimistic that the current high prices will last, we are confronted with a situation where reasonable near-term forecasts do not provide a substantial baseline for farm bill discussions. The eroded baseline makes achieving efficiency in a commodity title particularly important and should cause the various interest groups to really consider their highest priorities.

Price, Yield, and Revenue Risk

I turn now to a discussion of the agricultural risk protection context faced by producers in 2007. When I began my career as an agricultural economist, government policy for agricultural risks tended to be neatly divided between commodity programs, which protect against low prices, and crop insurance programs, which protect against yield risk. Further, relatively little consideration was given to the interaction between price and yield risk tools. Increasingly, crop insurance programs incorporate price risk, and the lines between the farm bill commodity title and crop insurance legislation have become increasingly blurred. Now, the Secretary of Agriculture's farm bill proposal includes provisions that would change the counter-cyclical payment program from price-triggered to revenue-triggered and would incorporate significant changes to the crop insurance program in the farm bill discussion.

Given the increasing importance of revenue in the policy debate, understanding how price and yield risk relate to each other and how revenue variability differs spatially and across commodities becomes important. Let me make several points about the nature of crop commodity risk. First, commodity program prices are remarkably homogenous. As one looks at the various farm program commodities—corn, soybeans, cotton, wheat, and sorghum—price risk (i.e., the price volatility) across these commodities tends to be quite similar.

Table 1. Price Variability Across Crops					
Crop	Cotton	Corn	Soybeans	Wheat	Sorghum
Coefficient of Variation	0.173	0.172	0.158	0.176	0.180
Source: 1975-2005 NASS Annual Prices					

Likewise, because of spatial arbitrage, the price variability for soybeans in Mississippi and the price variability for soybeans in central Illinois are quite similar. Therefore, the current as well as previous sets of commodity programs protect against price risks that are remarkably similar on a per unit basis across commodities.

My second point about the nature of agricultural risk is that crop yield risk is quite heterogeneous (Dismukes and Coble). Crop yield risk is heterogeneous across crops and across regions. In some areas of the country yield variability is four and five times greater than in other

areas of the country, which is illustrated in figure 1 for U.S. corn counties using detrended 1975-2005 NASS county data.

Next let me turn to crop revenue risk. Crop revenue risk is largely dominated by yield risk. In other words, looking across regions or crops, yield risk determines about 80 to 85 percent of the variation in revenue risk. Figure 2 shows a pattern of county corn revenue variability with very similar patterns as yields. Figure 2 also shows that the corn revenue coefficient of variation tends to be very low in the heart of the Corn Belt. Furthermore, in the fringe areas of a corn production region, the coefficient of variation well exceeds 50 percent in a number of cases. Likewise, figure 3 shows the cotton revenue coefficient of variation indicates significant differences in the level of variability. In the western states of Arizona and California, the coefficient of variation tends to be in the 20 to 30 percent range, while in much of Texas, the coefficient of variation exceeds 50 percent.

Another point I will make regarding revenue and yield risk is that because they are heterogeneous, aggregating toward the national level creates a portfolio effect. Therefore, the magnitude of yield or revenue variability decreases as one moves to the national level. This reduction is seen in table 2, which reports the coefficient of variation for national yield and revenue for an average county and for an average farm for cotton, corn, soybeans, and wheat. At the national level, revenue variability is greater than the yield variability for all four crops. In fact in most cases, it is approximately double the yield variability. However, moving to the farm level, yield variability increases dramatically and average farm-level yield and revenue variability are both much greater than at the national level. For an average farm, the yield variability is nearly as large as the revenue variability for each of the four crops.

Table 2. The Effect of Aggregation on Yield and Revenue Variability								
	Coefficient of Variation							
	Cotton		Corn		Soybeans		Wheat	
	Yield	Revenue	Yield	Revenue	Yield	Revenue	Yield	Revenue
National	0.11	0.20	0.08	0.15	0.07	0.13	0.08	0.18
Average County	0.26	0.31	0.15	0.19	0.13	0.18	0.26	0.30
Average Farm	0.39	0.43	0.25	0.28	0.25	0.28	0.43	0.47

Finally, regarding price- versus revenue-triggered programs, Midwest corn and soybean producers are predictably most likely to perceive the value of a revenue trigger. The reason is they perceive a strong negative yield-price correlation for their crops as shown in figure 4 for corn and figure 5 for soybeans. However, in terms of a national-level revenue trigger, the magnitude of the revenue variability at the national level is not the same across crops, as shown in table 2, where cotton revenue variability is the highest and soybean revenue variability is the lowest of the four crops I examine. Likewise, the correlation between national revenue and

county revenue is going to differ significantly depending on location. I chose five counties from which to evaluate the correlation between national and local prices and the correlation between national revenue and county revenue based on 1975-2005 NASS data. In four of the five locations, the correlation between local and national prices exceeded 0.93. Noxubee County, Mississippi, is the exception.

The correlation between national revenue and county revenue in Boone County, Iowa, is 0.9. Therefore, a national revenue trigger would provide this area relatively strong risk protection. Similarly, in Fulton County, Illinois, and Buffalo County, Nebraska, the correlation with national revenue is above 0.80. However, in Noxubee County, Mississippi, and Beaufort County, North Carolina, the correlation between national revenue and county revenue is 0.68 or lower. Further consideration of these relationships is needed to evaluate the effectiveness of a national revenue trigger.

Table 3. Comparison of price and revenue correlation		
	Correlation of Price to National Price	Correlation of Revenue to National Revenue
Buffalo County, NE	0.99	0.82
Fulton County, IL	0.99	0.80
Noxubee, County, MS	0.84	0.60
Boone County, IA	0.99	0.90
Beaufort County, NC	0.93	0.68

These results lead to an interesting dichotomy among producers across the country. My perception is that Cornbelt corn and soybean producers are generally attracted to revenue triggered designs while producers of other crops and in other regions are not. It appears these preferences are driven by perceived negative price-yield correlation. However, the relative magnitudes of revenue risk are greater in other regions and for other commodities. This suggests revenue triggered programs might shift benefits away from the Midwest corn and soybean producers. This will be particularly true if the revenue trigger is based on state, crop reporting district, or county revenue measures. As a result there appear to be significant trade-offs between the magnitude of payments and correlation of payments with producer risk..

The Inter-relationship of Risk Management Instruments

One of the themes I want to emphasize is the need to recognize the multiple instruments commonly present when a crop producer manages risk. Four primary instruments are available, and seldom in the policy discussion do we recognize all four of these simultaneously. Obviously, the commodity title of the farm bill includes the loan deficiency payment program and the counter-cyclical payment program. Likewise, crop insurance can have a significant impact on the risk of producing crops, whether yield insurance or revenue insurance of various forms. Fourthly, we also need to recognize that for most of our program crops the existing well-functioning forward pricing and futures markets allow producers to manage short-term price risk. For producers, regularly integrating the four tools can be a terribly complex decision, particularly given the availability of area or individual insurance coverage and that counter-cyclical payments are potentially decoupled. Likewise, the loan deficiency payment program and the counter-cyclical payment program are price risk protection tools that can overlap with the forward

pricing or futures marketing tools available from the private sector. Our crop revenue insurance products provide price risk protection as well.

Over the years I have spent a great deal of time considering these alternative risk instruments and have found that often producers face a difficult management decision in choosing how to combine forward pricing strategies with the available government programs (Coble, Heifner, and Zuniga; Coble, Miller, Zuniga, and Heifner; Thomas, Coble, and Miller). On the other hand, producers, if they choose to consistently adjust their forward pricing strategies in recognition of the commodity programs and crop insurance programs available to them, can create a portfolio of risk management tools that in many instances will provide quite effective risk management coverage.

Conclusion for Farm Policy

I tell my undergraduate agricultural policy class the best justification for government intervention is market failure. Government should consider concentrating on providing the protection farmers cannot obtain for themselves from the marketplace. By extension, I conclude that the best-justified risk management program would provide producers with yield risk protection because such protection is least likely to be available from the private sector due to the presence of systemic losses or asymmetric information.

Likewise, in terms of the crop insurance program, the increase in commodity prices have increased crop liability and potentially program premiums at the same time the LDP and countercyclical payment baselines are declining dramatically. This makes crop insurance a much larger portion of the overall agricultural baseline. The increase in premiums affects producer subsidies, company reimbursement, and agent commissions. We should also recognize significant efforts have been made to improve the rates and the designs of the products offered, and that I believe the overall actuarial soundness of the program is improving significantly. These developments have implications for producer benefits, justifying the subsidies allocated for the crop insurance program, and the reinsurance agreement with the private companies.

I also note that we will likely hear much discussion about politically-attractive disaster programs as we begin the farm bill debate. Although disaster bills are usually written on an ad hoc basis, such legislation if designed in the wrong way seriously conflicts with the crop insurance program whether ad hoc or permanent. Other proposals, such as layering, would be less intrusive to the crop insurance program. In the looming policy debate, we should work to reducing the redundancy and duplications of programs rather than increase the duplication.

Finally, as we begin a serious debate regarding government's role in providing risk management tools to producers, I come full circle on the topic I have been asked to address. Nearly everything on the proverbial table appears to be WTO amber box and federal budgets are tight. Therefore, we need to focus on the programs that offer the most efficient and useful type of risk management protection. Not all commodities face the same risks, nor do all regions. The challenge will be to develop useful and workable risk tools that function most efficiently.

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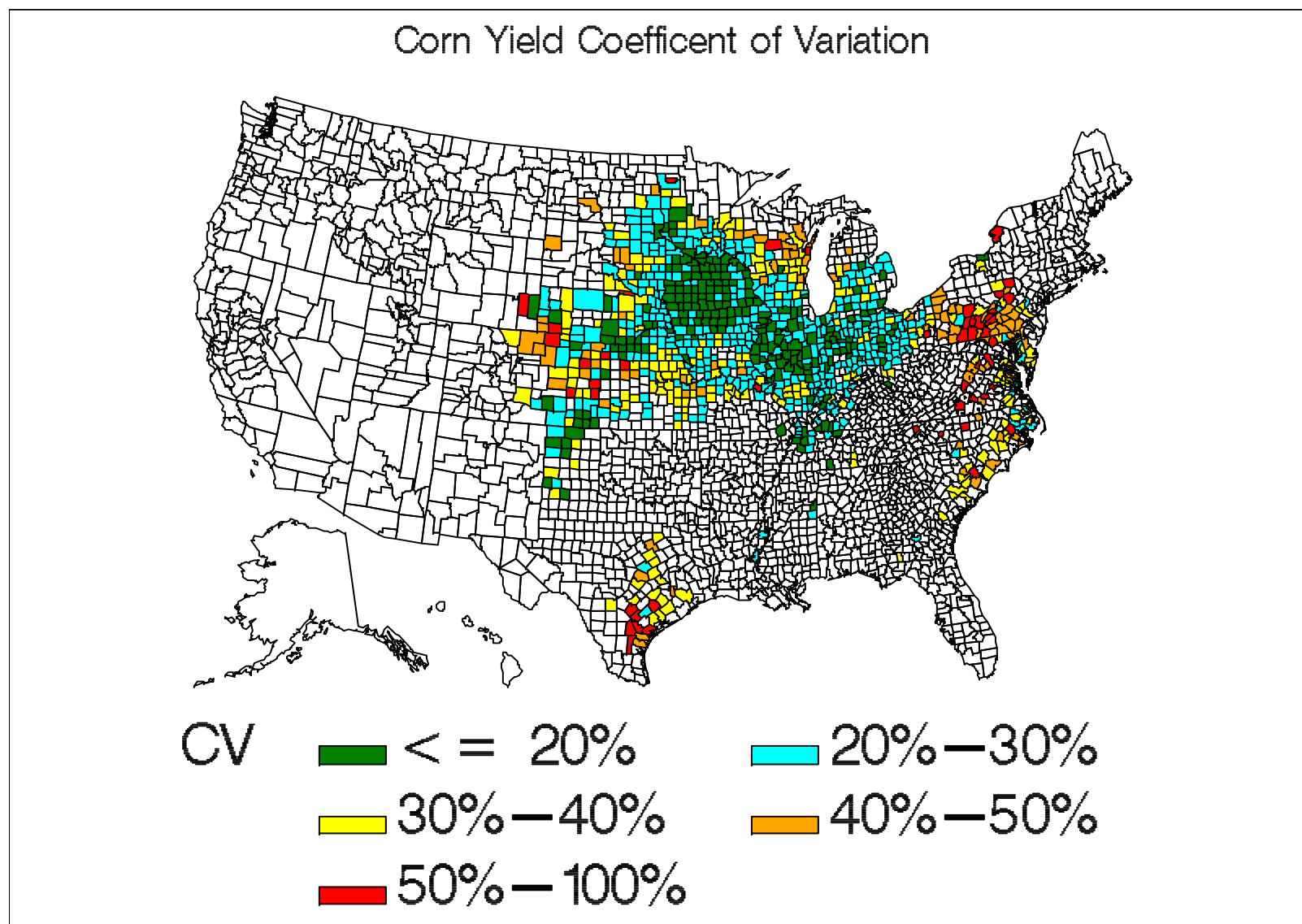


Figure 1

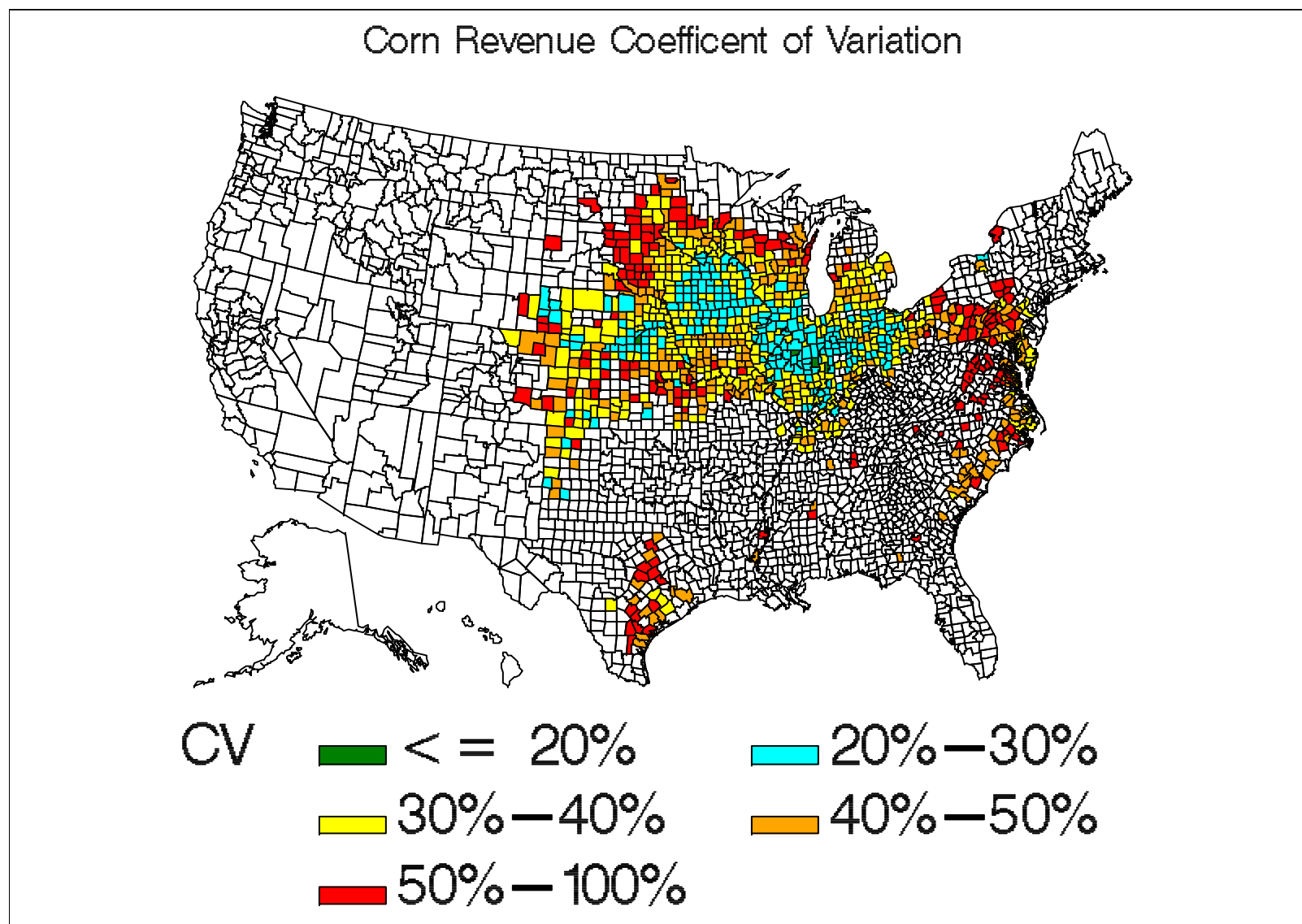


Figure 2

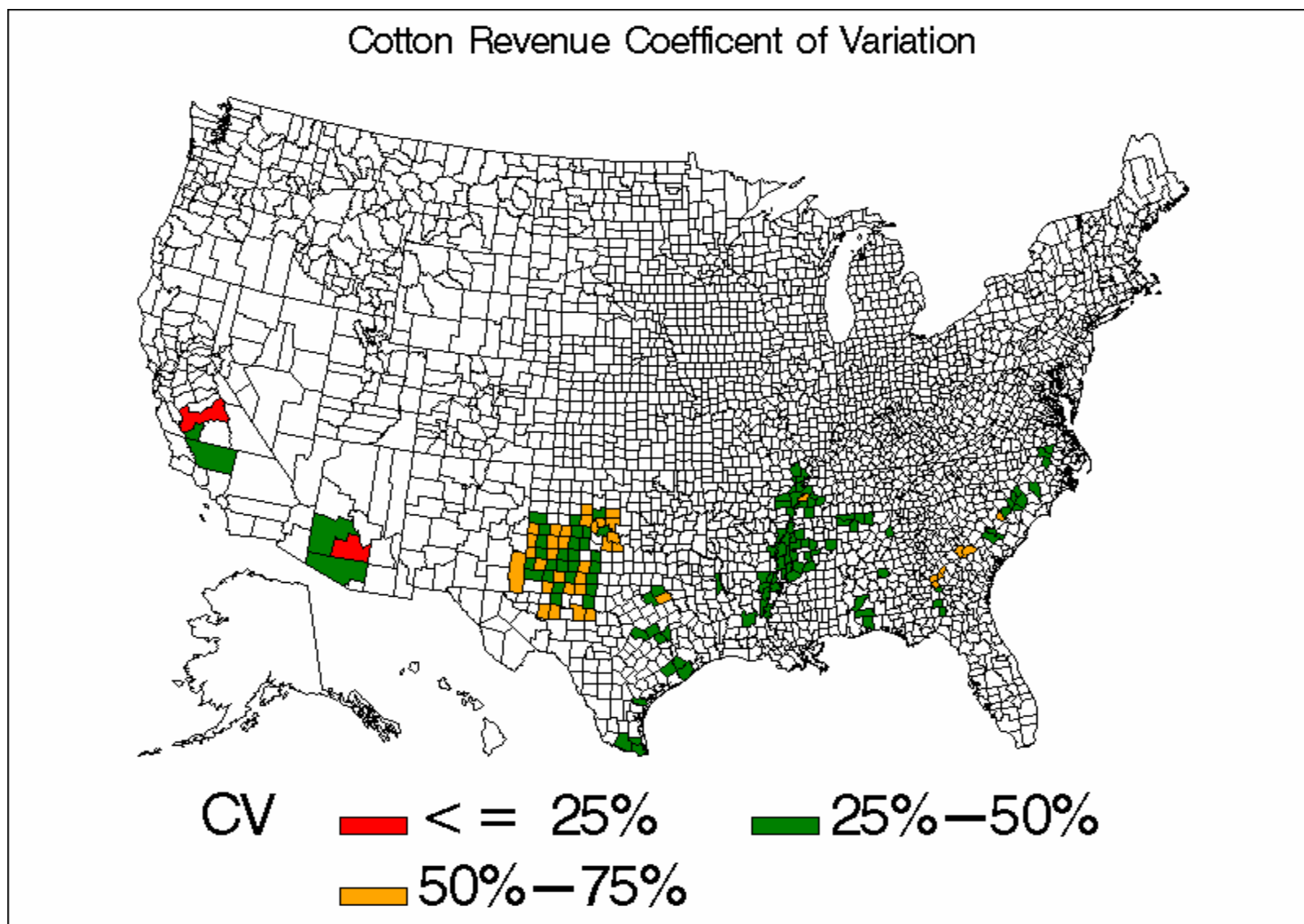


Figure 3

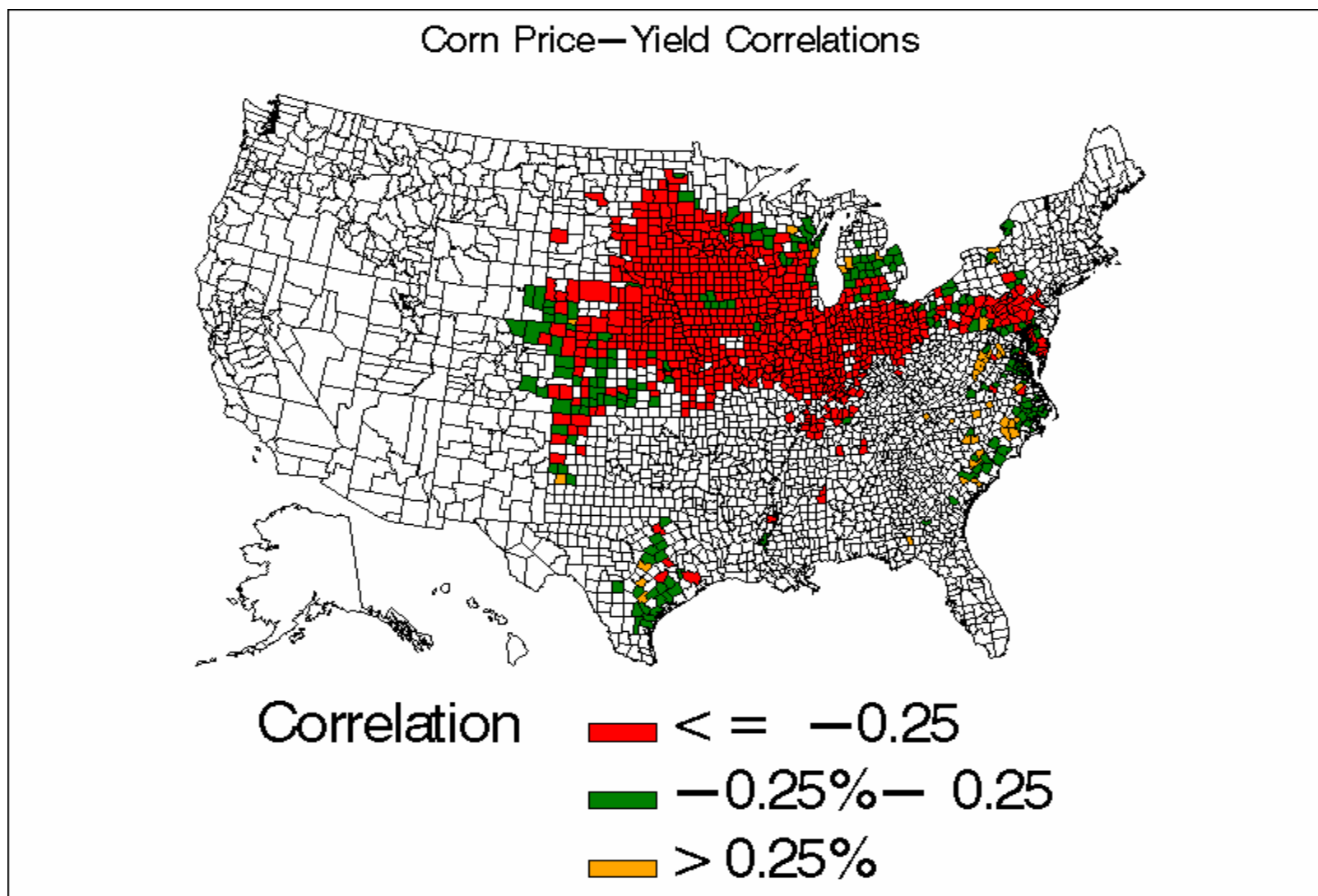


Figure 4

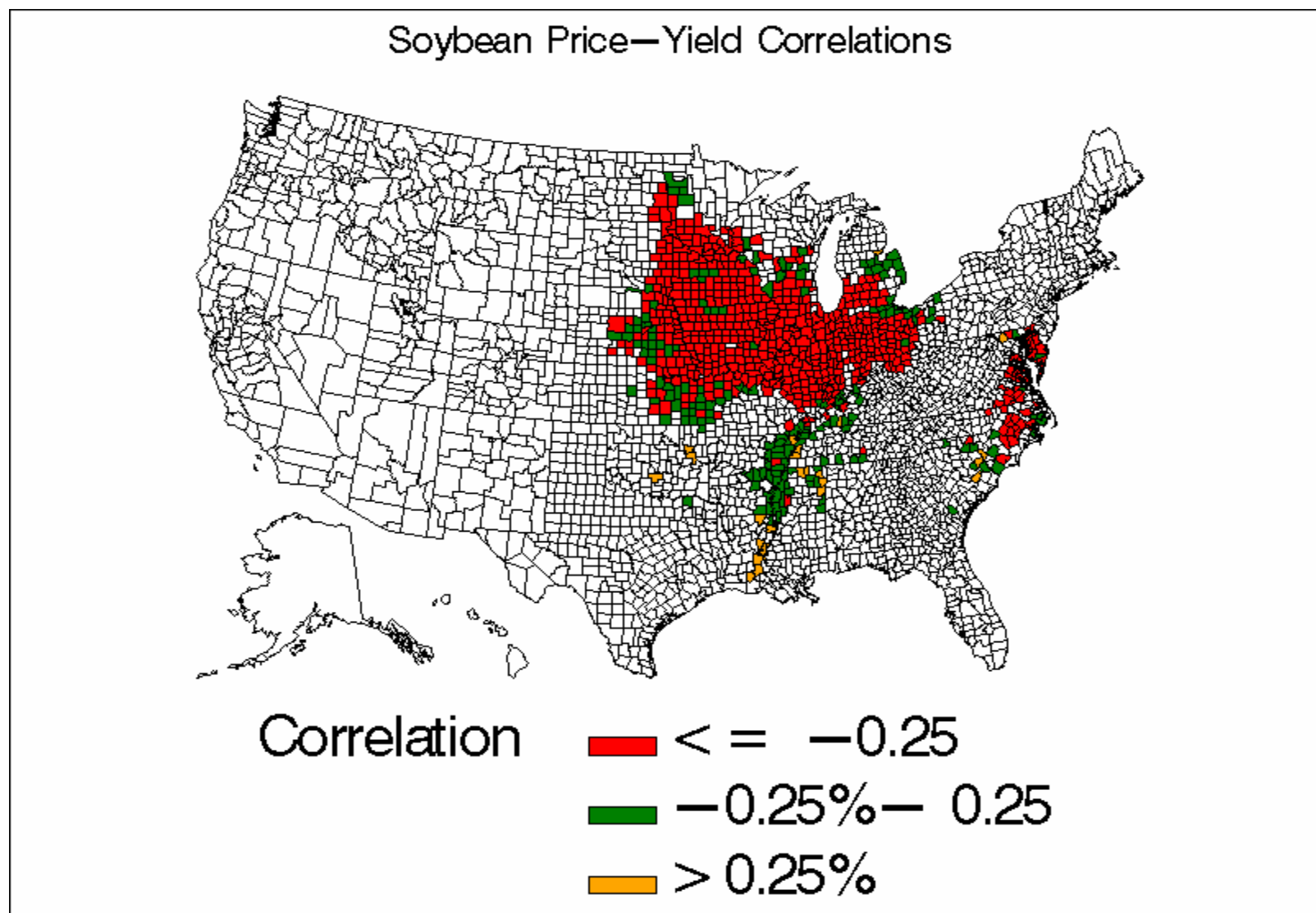


Figure 5

Federal Crop Insurance and Farm Programs — Will WTO or Budget Concerns Shape the Debate?

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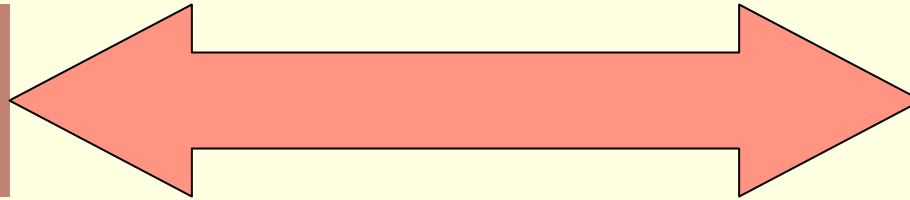
WTO Implications

- Assuming there are no breakthroughs:
 - we deal with the current agreement
- Decoupling – breaking the incentive to produce for the program
 - Reducing the distortions in the market signals
 - “it shall not relate to the type or volume of production (including livestock units) undertaken by the producer; or to the prices,”
- Creates a government risk management policy dilemma

WTO Implications

The Policy Trade-Off We Face

WTO
Decoupling



Risk
Management



The Two Best Bets for WTO Compliance

- The current direct payment program without the fruit and vegetable provision.
 - Does not help with risk
- A whole farm revenue guarantee with a 70% trigger that subsumes crop and livestock revenue.
 - Simple in theory
 - Complicated in practice
 - Not very attractive

Budget Dilemma

- Good prices are reducing the baseline
- Similar to 1996?
- I will be a contrarian
 - As long as corn is a commodity – we will find a way to produce more
 - and low prices will return.



The Nature of Agricultural Risk

- Crop price – homogeneous
 - Across regions and crops
 - Most program crop producers face fairly similar price risk and commodity program effects on a per unit basis

Price Variability Across Crops					
	Cotton	Corn	Soybeans	Wheat	Sorghum
Coefficient of Variation	0.173	0.172	0.158	0.176	0.180
Source: 1975-2005 NASS Annual Prices					

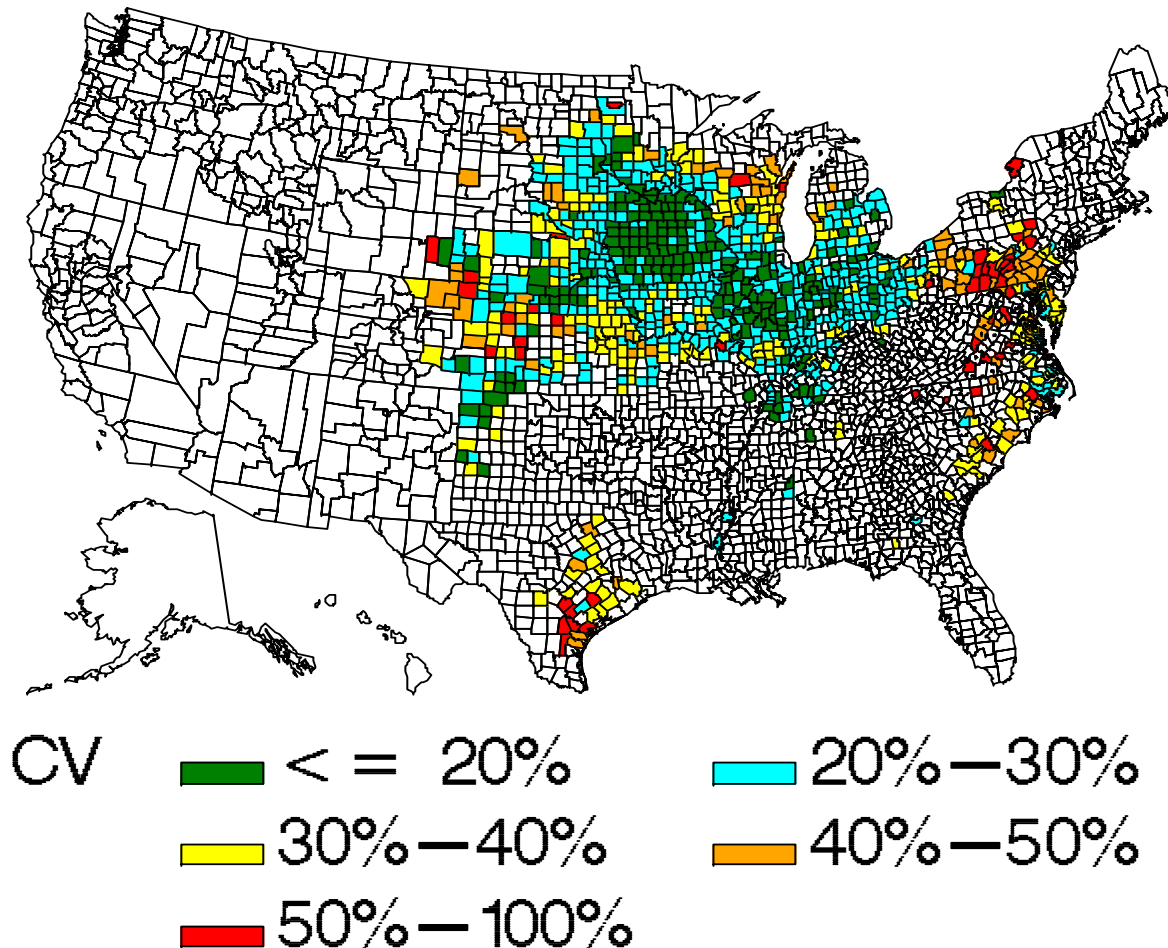
The Nature of Agricultural Risk

- Crop yield risk – heterogeneous
 - Varies by crop
 - Varies by region
 - Varies by production practice
- Crop revenue risk – dominated by yield risk
- Because yield and revenue risk are heterogeneous
 - diminish with aggregation



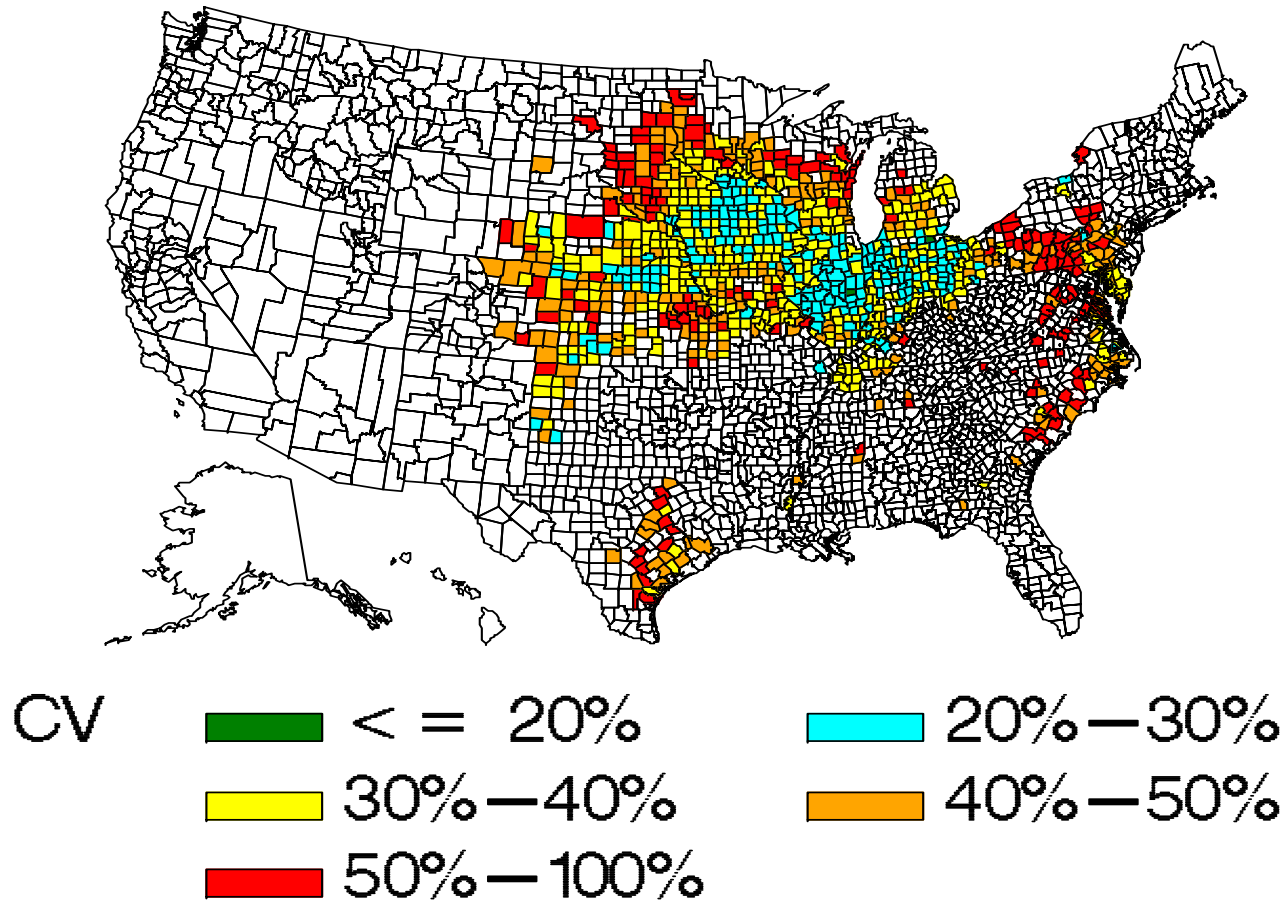
Yield Risk Varies Dramatically by Region

Corn Yield Coefficient of Variation



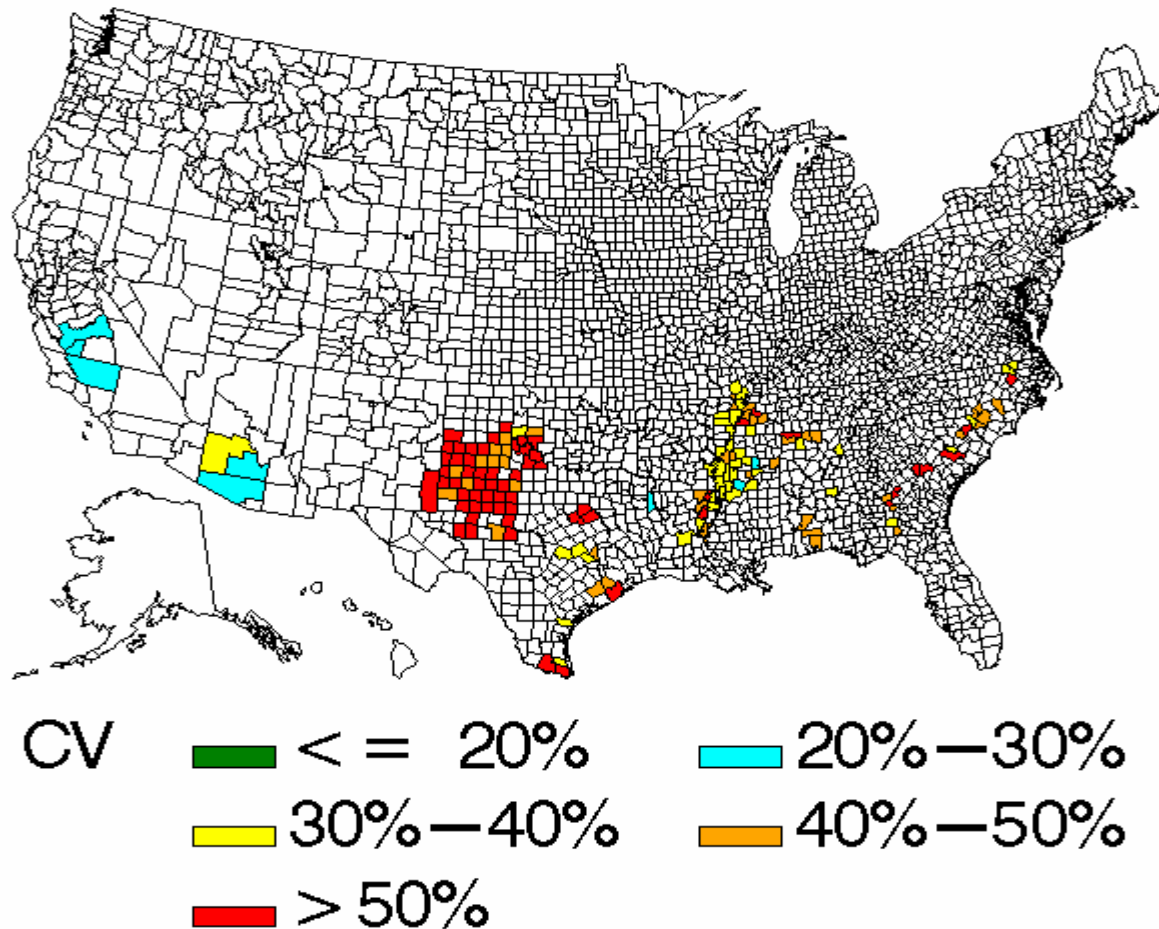
Revenue Risk is Driven by Yield Risk

Corn Revenue Coefficient of Variation



Revenue Risk is Driven by Yield Risk

Cotton Revenue Coefficient of Variation

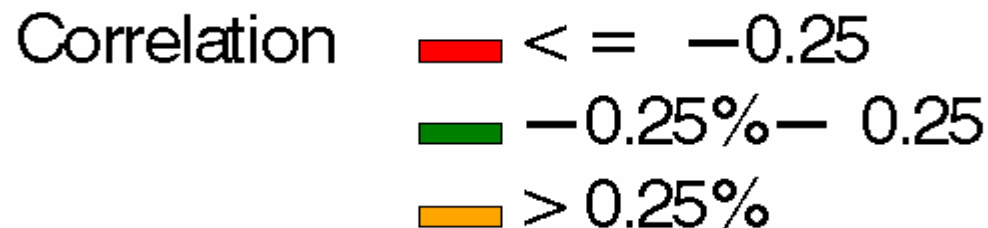
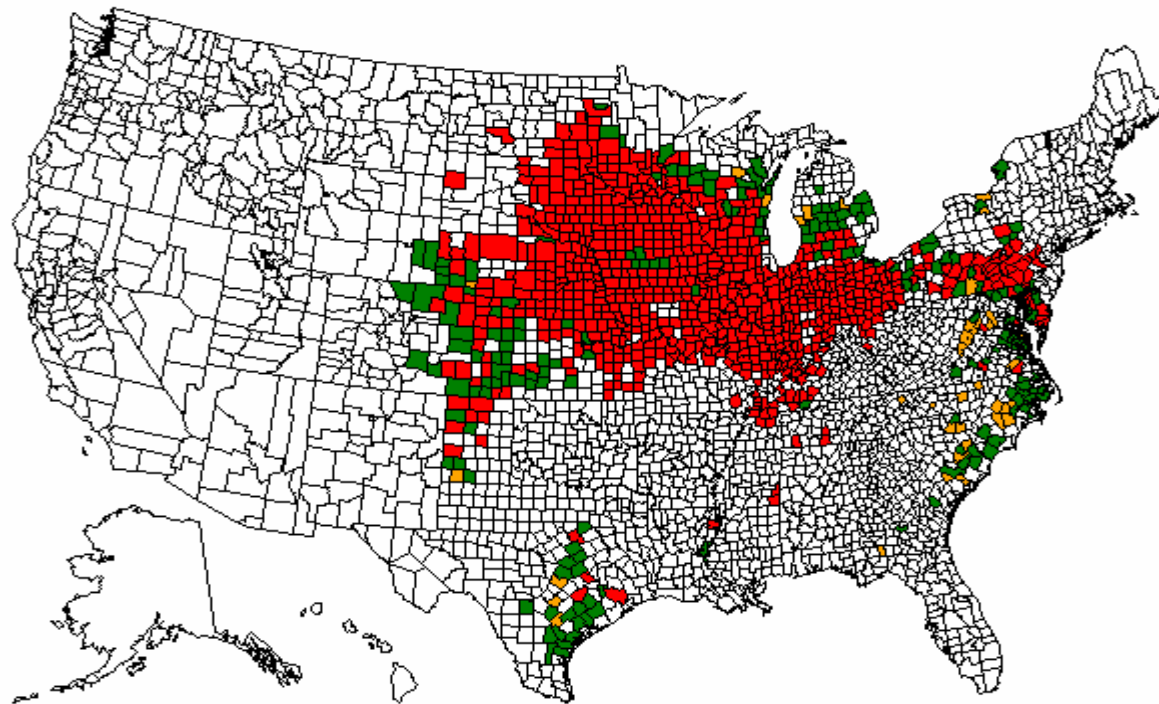


Correlation of County Corn Revenue to National Corn Revenue

	Correlation of Price to National Price	Correlation of Revenue to National Revenue
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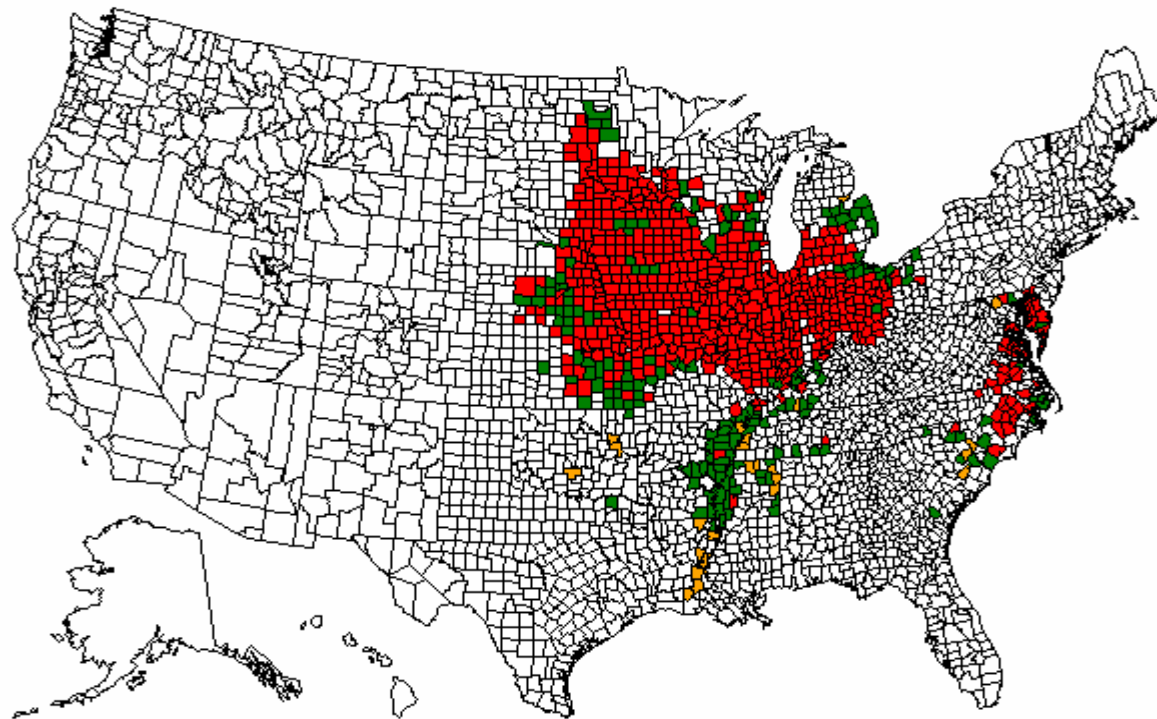
Perceptions of Yield Price-Correlation

Corn Price—Yield Correlations



Perceptions of Yield Price-Correlation

Soybean Price—Yield Correlations



Correlation

■ ≤ -0.25

■ $-0.25\% - 0.25$

■ $> 0.25\%$

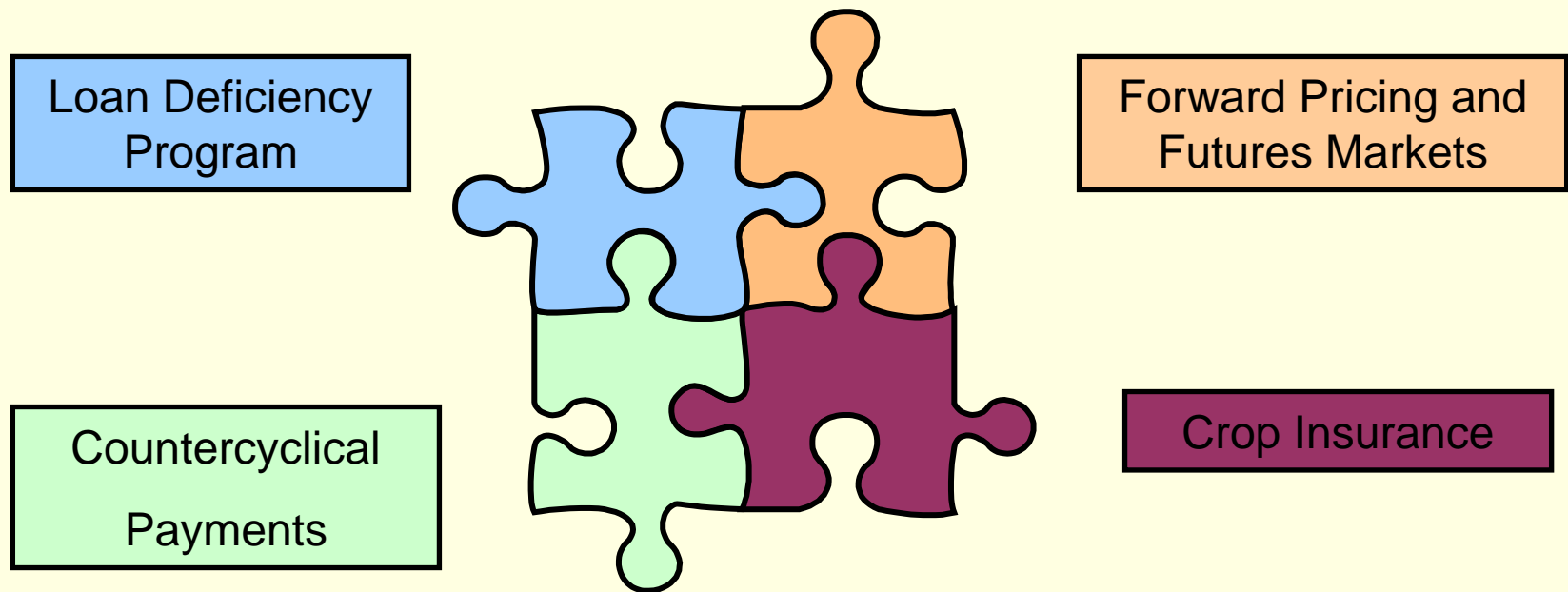
Food for Thought

- Revenue triggered programs
 - Generally popular in Corn Belt where there is negative price-yield correlation
 - Less popular elsewhere where there is little price-yield correlation
- Revenue variability
 - Higher for cotton and wheat
 - Higher outside of the Corn Belt

The Effect of Aggregation on Yield and Revenue Variability

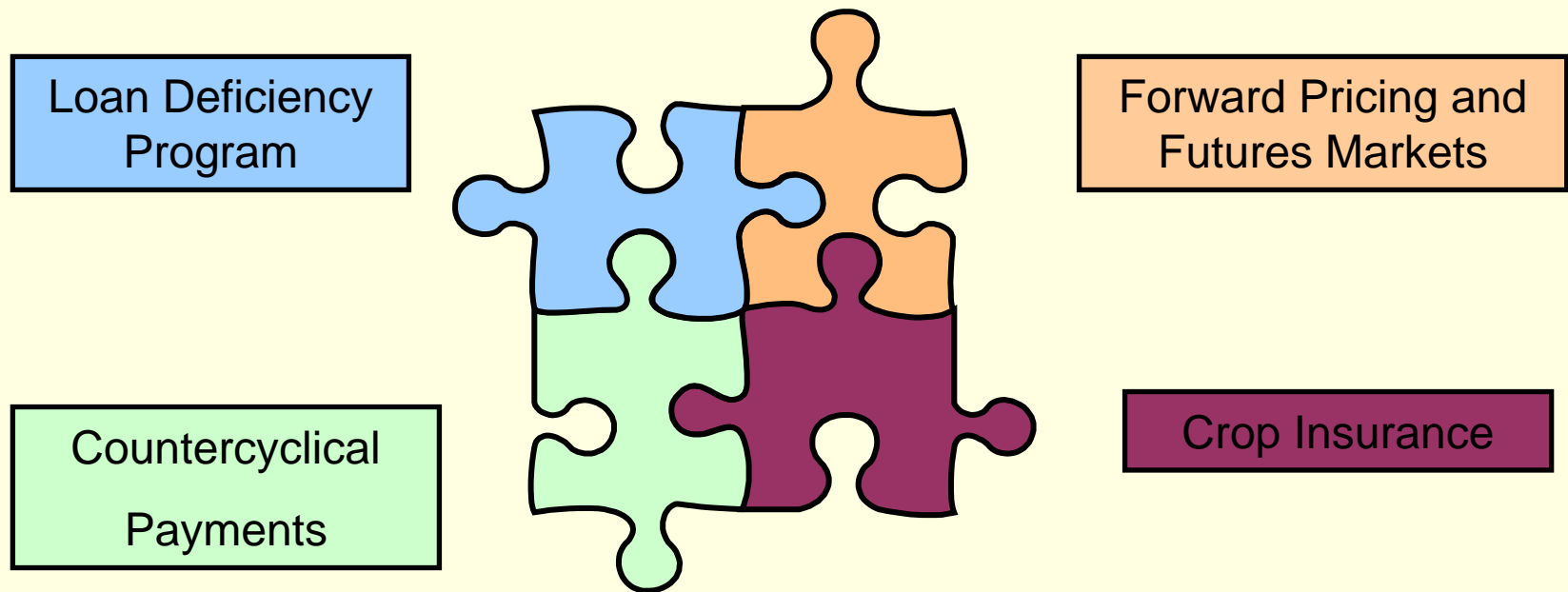
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Average Farm	0.39	0.43	0.25	0.28	0.25	0.28	0.43	0.47

The Risk Management Puzzle for Crop Producers



- Decoupled Countercyclical Payments
- Insurance – yield, revenue, or revenue with upside protection

The Risk Management Puzzle for Crop Producers



- Duplication of coverage – LDP, RA-HPO, forward pricing
- Coble, Heifner, Zuniga – Producers need to adjust forward pricing to reflect the commodity programs and crop insurance.

Government Role in Risk Management

- The best justification for government intervention is market failure
 - Government should concentrate on providing the protection farmers cannot obtain from the market place.
 - Many major commodities can get short-term, but not long-term price protection from futures market
 - Traditionally yield risk not offered by market due to
 - Systemic risk
 - Asymmetric information

Government Role – Crop Insurance

- So what does this imply?
 - Emphasize the aspects of crop insurance that deal with farm-level yield risk
 - Improve rates
 - Producer value
 - Company earnings
 - High prices = increased liability = increased program cost
 - Disaster programs are politically attractive but usually ad hoc = conflict with crop insurance
 - Layering proposal are preferable to recent ad hoc disaster bills

Government Role – Commodity Title

What it would take to achieve green box would not be politically acceptable risk protection

- Avoiding conflict with private price risk tools
 - Establish price targets and let producers hedge short term price risk
- Integrating commodity programs and crop insurance
 - Wraps
 - Layers