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Assessing the Political Economy of the 2014 U.S. Farm Bill

Carl Zulauf and David Orden

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Carl Zulauf and David Orden*

Abstract

This chapter assesses the political economy of the 2014 farm bill, which eliminated annual fixed direct payments but offers enhanced downside risk protection against low prices or declining revenue. The farm bill secured substantial bipartisan majorities in a politically contentious Congress. The countercyclical structure of U.S. support is reaffirmed and crop insurance is enhanced as a safety net pillar. Open policy issues include the distribution of benefits among crops, the design of multiple year support around moving-average revenue benchmarks versus fixed reference prices, and questions related to crop insurance, including the overall level of premium subsidies. In an international context, we conclude the 2014 farm safety net likely would not have been enacted had multilateral agreement been reached on the 2008 Doha Round negotiating documents; conversely, the 2014 safety net makes achieving those limits more difficult.

Keywords: Agricultural policy, 2014 farm bill, farm subsidies, commodity programs, crop insurance, conservation, WTO

JEL Classification: Q17, Q18, Q28, K33, N52

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Assessing the Political Economy of the 2014 U.S. Farm Bill

This article assesses the domestic and international political economy of the *Agricultural Act of 2014* (P.L. 113-79; 2014 farm bill). Passed in February 2014 after three years of intense debate, it reaffirms through 2018 the longstanding support for U.S. farmers. The debate was framed by large federal budget deficits resulting from a deep economic recession and five years of slow recovery. Given high crop prices and farm incomes during this period of national economic stress, the time may have seemed propitious to lessen the role and fiscal cost of U.S. farm policy. Instead, maintaining public assistance remained a keen objective of farmers and their congressional allies and they mostly succeeded.

The farm safety net that emerged is complex but can be abstracted to a few points. Fixed direct payments of about \$4.5 billion annually are eliminated, ending a program of nearly two decades. Countercyclical support, which has a long precedent in U.S. farm policy, is strengthened. Specifically, downside risk protection is increased for both what are termed shallow losses that coincide with the deductible on individual farm insurance and multiple year losses associated with persistent low prices or declining revenue. Also strengthened is the core role for federally subsidized, privately delivered crop insurance for production-period risk. This strengthening of the downside risk safety net highlights the question of what share of U.S. farmers' risk the public should bear. The fiscal cost of the revised safety net is less certain than with fixed direct payments. Costs may prove to be more or less than if the 2014 farm bill had not been enacted.

With agriculture a small but relatively prosperous and concentrated sector of the economy, it is plausible to maintain that U.S. farm policy is an equilibrium result of interest group lobbying.¹ Each farm bill is driven by specific contestation among various farm and nonfarm political interests. Yet, farm policy also retains continuity along lines best assessed in retrospect. This is the case for the 2014 farm bill. Significant evolution of risk assistance programs occurred but key past reforms that lessen the distortionary effects of U.S. farm policy were retained, in particular fixed payment bases, planting flexibility, and low loan rates.

¹ Anderson, Rausser and Swinnen (2013) assess alternative theoretical approaches and empirical evidence on the political economy of agricultural policies across political systems. Among concepts they review that are illustrated in our narrative are interest group lobbying, status quo bias, countercyclical bias, aversion to loss, ideology, the role of information, and obfuscation. Comparative governance concepts are not illustrated in this temporal evaluation of U.S. farm bills within a fixed institutional structure.

Some observers conclude that the extended debate that preceded enactment of the 2014 farm bill signals a loss of political power by the farm lobby. We disagree. The 2014 farm bill reaffirms historical farm support while providing benefits to other traditional constituencies, including conservation and nutrition assistance, as well as new stakeholders. Moreover, permanent legislation is retained, setting the stage for another farm bill starting with stronger protection against downside risks.

In an international context, we conclude the U.S. is unlikely to exceed its World Trade Organization (WTO) domestic support commitment, a topic addressed further by Glauber and Westhoff (2015). Support is more likely to exceed the tighter constraints of the December 2008 WTO Doha Round negotiating documents. Had a Doha agreement been reached, it is unlikely the 2014 farm bill would have been enacted as it is. Conversely, its enactment makes achieving the Doha limits more difficult. In contrast, the WTO rulings in the Brazil-U.S. cotton case led to substantive changes in the safety net for upland cotton.

Change and Continuity in U.S. Farm Policy

As shown in Table 1, the last four farm bills were enacted with large bipartisan congressional majorities; twice veto proof, once needed (2008) and once not (1996). These majorities emerged with differing control of Congress and the presidency. After extensive debates, each bill to varying degrees turned policy in a different direction while continuing support for farmers (Orden Blandford and Josling 2011). Under the first Republican-controlled Congress in four decades and with rising crop prices, reforms in the 1996 farm bill included an unexpected adoption of fixed direct payments, which decoupled support from prices and planting, and an end to annual supply-control and most public-stock programs. Despite budgetary pressure, the fixed payments allowed farmers to capture support that would have evaporated as market prices rose above target prices. Reform advocates hoped these payments might be a transition, or buyout, bringing an end to commodity programs, while farm program proponents noted that Congress remained the final guarantor of a safety net.

As farm support proponents had argued, Congress stepped in quickly with *ad hoc* payments when prices fell in 1998; the precursor to reviving a price countercyclical program in the 2002 farm bill. Even with low prices and farm incomes, a divided Congress retained planting flexibility and direct payments and did not reintroduce annual supply controls nor raise loan rates significantly.

Table 1. Make-up of Congress and 1996 through 2014 Farm Bill Votes

Final short title	Public law	President	House		Senate	
			Party control	Farm bill vote	Party control	Farm bill vote
Federal Agriculture Improvement and Reform Act of 1996	104-127 (4/4/1996)	Clinton	Republican <i>228R/206D/1I</i>	318 - 89 <i>211R/106D/1I</i>	Republican <i>53R/47D</i>	74 - 26 <i>52R/22D</i>
Farm Security and Rural Investment Act of 2002	107-171 (5/13/2002)	Bush	Republican <i>222R/211D/2I</i>	280-141 <i>141R/137D/2I</i>	Democrat <i>49R/50D/1I</i>	64 - 35 <i>43D/20R/1I</i>
Food, Conservation, and Energy Act of 2008	110-234 (5/22/2008)	Bush	Democrat <i>202R/233D</i>	316 – 108 <i>216D/100R</i> (veto override)	Democrat <i>49R/49D/2I</i>	82 – 13 <i>45D/35R/2I</i> (veto override)
Agricultural Act of 2014	113-79 (2/7/2014)	Obama	Republican <i>232R/200D</i>	251 - 166 <i>162R/89D</i>	Democrat <i>45R/53D/2I</i>	68 - 32 <i>44D/22R/2I</i>

Sources: Compiled by the authors based on membership and roll call votes reported at www.congress.gov, www.senate.gov and www.clerk.house.gov.

Notes: Votes are on the farm bill conference report, except 2008 veto override. D is Democrat; R is Republican; I is independent. Party affiliation at the time of the farm bill and yea votes by party in italics. Three House seats were vacant at the time of the 2014 farm bill vote.

During the 2008 farm bill debate, a Democrat-controlled Congress prioritized food assistance. The Food Stamp program, renamed the Supplemental Nutrition Assistance Program (SNAP), expanded eligibility criteria and signaled a shift from food access to improved nutrition. Farm groups were generally wary of changes to their safety net. Direct payments were retained, even as critics questioned their legitimacy with high crop incomes and eyed reductions to fund other priorities. The optional Average Crop Revenue Election (ACRE) program embodied several innovations sought by Midwest grain producers including a moving-average revenue benchmark, enacted into law for the first time, and a focus on shallow losses. Enrollment was modest due to a design viewed as complex and a 20% reduction in direct payments if ACRE was elected (Edwards 2011).

Against this policy background, the 2014 farm bill was framed by divided control of Congress and a largely partisan debate over entitlement programs and fiscal deficits. SNAP expenditures rose during the post-2007 economic slowdown (Wilde 2012), averaging \$49.9 billion in 2008-10 then \$74.2 billion in 2011-13. In contrast, the U.S. farm sector experienced a remarkable six years of prosperity. Net farm income averaged \$74 billion during 2008-10, increasing to \$121 billion during 2011-13. Corn and cotton prices averaged over 40% higher during the latter three years, while soybean and wheat prices averaged 27% and 14% higher.

With the farm sector prospering, contested direct payments continuing, and crop insurance net indemnity payments rising sharply, support payments reached a politically unstable level. Net indemnity payments averaged \$9.1 billion for 2011-13, exceeding direct payments each year, and peaking at \$13.3 billion after the 2012 drought. With high incomes, but facing yield, price and revenue variability, most farm groups endorsed wider calls to eliminate direct payments as unjustified when farm incomes were high. They argued that most of the savings should go into strengthening insurance and other downside risk safety net programs—the eventual outcome.

Similar to the 1996 farm bill, the 2014 farm bill debate became mired in rancor over competing interests within the farm lobby and the broader deficit-related stand-off. In August 2011, as a Republican House squared off with a Democratic Senate and administration, Congress empaneled a super committee to find accord and authorized across the board sequester cuts if it failed. Key farm bill funding deliberations took place in this context but the super committee disbanded without agreement.

The Democratic Senate approved a farm bill in July 2012 but the House leadership never scheduled floor debate on a bill passed that month by its Agriculture Committee. With budget gridlock continuing after the November 2012 elections, the 112th Congress ended with a stop-gap measure to extend most provisions of the 2008 farm bill one year, through September 2013. The sequester cuts took effect in March 2013, including \$6 billion over 10 years to projected farm commodity and conservation spending. Ensuing stalemate culminated six months later in the first partial government shutdown since 1995. Only then, in mid-October, did a fiscal truce emerge around continuing appropriations and an extended federal debt ceiling.

The Senate passed a second farm bill in June 2013, moving closer to the 2012 House version of commodity programs. In the House, a conservative caucus vociferously criticized both farm support and nutrition entitlement programs. The House defeated an Agriculture Committee bill then passed separate bills on farm programs and nutrition assistance. SNAP expenditures were reduced 5% (\$40 billion), ten times the reduction proposed by the Senate. With this and other disparities, a second one- or two-year extension of the 2008 farm bill was widely expected prior to the fiscal truce. In its wake, under scrutiny to demonstrate the ability to govern, the *Agricultural Act of 2014* became one of the few major bills passed by the 113th Congress.

2014 Farm Bill Programs and Issues

Table 2 summarizes the planted and commodity program (base) acreage for nine major crops that received direct payments under the 2008 farm bill. Table 3 contains key features of the 2014 farm bill commodity and crop insurance programs and Table 4 presents some of the key commodity program parameters; for further discussion see, *inter alia*, CRS (2014), U.S. Congress (2014), USDA (2014a), Smith (2014) and Zulauf and Orden (2014).

Crop insurance is enhanced in the 2014 farm bill, including a new county level shallow loss program, the Supplemental Coverage Option (SCO), to partly cover the insurance deductible. The traditional upland cotton and dairy support policies are dramatically redesigned into a new cotton insurance program and dairy margin protection program, while the sugar support program is retained largely unchanged, an outcome also sought by producers. Price and revenue-based commodity programs are revised, embedding higher support parameters. Despite heated debate on recoupling crop program payments to current planting (Zulauf 2014a), payments largely remain decoupled and farmers retain planting flexibility on fixed program acres (with expanded options for planting fruits and vegetables). The marketing loan program extends

Table 2. Planted and Base Acres, Crops Receiving Direct Payments, 2012 Crop Year

Crop	Planted acres (million)	Share of principal crop^a acres	Program (base) acres^b (million)	Share of program acres
Barley	3.6	1.1%	8.6	3.3%
Corn	97.2	29.8%	84.3	32.6%
Cotton (upland)	12.1	3.7%	17.9	6.9%
Oats	2.8	0.8%	3.0	1.2%
Peanuts	1.6	0.5%	1.5	0.6%
Rice	2.7	0.8%	4.4	1.7%
Sorghum	6.2	1.9%	11.6	4.5%
Soybeans	77.2	23.7%	50.1	19.4%
Wheat	55.7	17.1%	73.7	28.5%
Total	259.1	79.4%	255.1	98.7%

Source: Data from USDA.

Notes: ^a Principal crops include most crops except fruits, nuts and vegetables. Area planted to principal crops totals 326.3 million acres versus 259.1 for the nine crops receiving direct payments. ^b Total base acres for the United States are 258.3 million acres.

price floors coupled to crop production but at levels well below recent market prices except in the cases of sugar, cotton and peanuts.² Options to reallocate program acreage and to update program yields also temper decoupling, but Hendricks and Sumner (2014) find only small production effects from past base updating. In sum, while repeal of direct payments brought a \$41 billion reduction in support over 10 years, the fiscal score (Table 5) by the Congressional Budget Office (CBO) at the time the farm bill was enacted projected that nearly 80% of the saving was retained in various farm safety net programs in the commodity and crop insurance titles.

Insights on the impetus to redesign the crop safety net can be gleaned by comparing crop insurance net indemnity payments and direct payments by state and crop (Glauber 2012, Zulauf 2014b). For 42 of 49 states (Alaska not included), their share of net indemnity payments during 2004-13 was within two percentage points of their share of direct payments. The largely similar distributions by state and high levels of net indemnities in 2011-13 made it easier for farmers collectively to give up direct payments, while protecting crop insurance. In contrast, the ratio of net indemnity payments to direct payments varies notably by crop: from 12% and 39% for rice and peanuts, respectively, to 92%, 121%, and 135% for corn, cotton, and sorghum. This difference explains in part why rice and peanuts resisted the elimination of direct payments and argued for high target prices, while cotton could opt for an insurance program.

² The cotton loan rate of 45 to 52 cents per pound is between 55% and 65% of the Olympic average of 2009-13 market prices, a level higher than for all other crops except sugar (which exceeds the world price) and peanuts (64% of the 2009-13 market price average).

Table 3. Brief Description of the *Agricultural Act of 2014* Farm Safety Net Programs

Title I: Commodity programs	
Price Loss Coverage (PLC) (revised target price program)	Price commodity program. Payment made if price is below reference price fixed by Congress. No premium is paid but payment made on a fixed historic payment yield and on only 85% of historic program (base) acres.
Agriculture Risk Coverage (ARC) (revised revenue program)	Revenue commodity program with two versions: county and individual. Revenue benchmark changes with yield and market price subject to a minimum price (PLC reference price). Payment occurs if revenue loss is between 14% and 24% of benchmark. No premium is paid but payment is made on only 85% (county) or 65% (individual) of historic program acres.
Marketing Loan (existing program)	Price commodity program. Payment made on current output if price is below loan rate fixed by Congress. Loan rates less than PLC reference prices are retained at 2013 levels except the cotton loan rate reduced from a fixed 52 cents per pound to a range between 45 and 52 cents per pound.
Dairy Margin Protection Program (MPP) (new program)	Replaces dairy price and income support programs. Payment made to participating dairy farmers if margin between milk prices and feed costs is below \$4 per cwt with no premium. Option to pay a premium to insure margin up to \$8/cwt. Government purchase of dairy products for domestic food programs authorized when margin guarantee payments are triggered.
Sugar (existing program)	Retained largely unchanged; loan rates above world prices protected by import restrictions.
Supplemental Agricultural Disaster Assistance (renewed program)	Authorized retroactively and on a permanent basis four disaster aid programs first authorized in the 2008 farm bill for livestock, farm-raised catfish, honeybees, orchard trees and nursery stock.
Title XI: Insurance programs	
Crop yield and revenue insurance (existing program)	Yield and revenue insurance contracts at the farm enterprise and smaller unit level as well as at county level. Coverage elected by farmer. Farmer pays part of actuarially fair premium, averaging 38%. All planted acres can be insured.
Supplemental Coverage Option (SCO) (new program)	Yield or revenue insurance program that makes indemnity payment if county yield or revenue is between 86% and coverage level elected for underlying individual farm insurance contract. Available if not enrolled in ARC. Farms pay 35% of actuarially fair premium.
Stacked Income Protection Plan (STAX) (new program)	Revenue insurance program for upland cotton only. Insurance indemnity payment received if county revenue is between 90% and coverage level elected for underlying individual insurance contract or can be purchased on stand-alone basis. Farms pay 20% of actuarially fair premium.

Source: Zulauf and Orden (2014).

Table 4. Comparison of Price Parameters for Title I Crop Programs, Major Crops

Crop ^a	Loan rate	Target price	PLC reference price	Estimated ARC price component ^b
	2014	2013	2014	2014 crop year
Barley	\$1.95	\$2.63	\$4.95	\$5.45
Corn	\$1.95	\$2.63	\$3.70	\$5.28
Oats	\$1.39	\$1.79	\$2.40	\$3.25
Peanuts	\$0.1775	\$0.2475	\$0.2675	\$0.2787
Long-grain rice	\$6.50	\$10.50	\$14.00	\$14.17
Medium-/short-grain rice	\$6.50	\$10.50	\$14.00	\$17.87
Sorghum	\$1.95	\$2.63	\$3.95	\$5.09
Soybeans	\$5.00	\$6.00	\$8.40	\$12.27
Wheat	\$2.94	\$4.17	\$5.50	\$6.60

Sources: Congressional Research Service (2014), USDA, and authors' calculations.

Notes: ^a Units are \$/bushel except for peanuts (\$/pound) and rice (\$/hundredweight). ^b ARC's price component for the 2014 crop year is the Olympic average for the 2009-2013 crop years of MAX (crop year price, PLC reference price). Crop year price is from USDA, National Agricultural Statistics Service at its Quick Stats website, August 2014.

Table 5. CBO Budget Score Summary, *Agriculture Act of 2014* Estimated FY2014-FY2023 Outlays

Farm bill title	Billions dollars (10-year totals)	
	Estimated outlays	Estimate change from baseline
		(extension of 2008 farm bill)
Farm support programs	134.3	-8.6
Commodity programs	44.5	-14.3
<i>of which</i>		
Repeal Direct Payments		-40.8
Repeal Countercyclical Payments		-1.5
Repeal ACRE		-4.7
PLC		13.1
ARC		14.1
Dairy Program		0.9
Supplemental Disaster Assistance		3.7
Crop insurance	89.8	+5.7
<i>of which</i>		
SCO		1.7
STAX		3.3
Conservation	57.6	-4.0
<i>of which</i>		
Conservation Reserve Program		-3.3
Conservation Stewardship Program		-2.3
Agricultural Conservation Easement		1.2
Nutrition	756.4	-8.0
All other titles	8.1	+4.1
Total	956.4	-16.5

Source: Congressional Budget Office (2014).

Redesign of Commodity Programs

Reflecting disagreement among farm groups over the design of shallow and multiple year loss programs, the 2014 farm bill authorizes four options. Shallow loss programs are SCO and Agriculture Risk Coverage (ARC), a revision of ACRE, with county (ARC-CO) and individual (ARC-IC) versions.³ Multiple year loss programs are Price Loss Coverage (PLC), a revised price countercyclical program, and the two ARC options. Target prices (renamed reference prices) are mostly increased 30% - 50% (ranging from 8% for peanuts to 88% for barley). The resulting reference prices, expressed as a percent of the Olympic average (drop the low and high years) price for the 2009-2013 crop years, range from 68% and 70% for soybeans and corn (reference prices of \$8.40 and \$3.70 per bushel) to 96% and 99% for peanuts and long grain rice (reference prices of \$0.2675 per pound and \$14 per hundredweight). The reference prices are fixed values over which Congress exerts control. In contrast, ARC's revenue benchmark is equal to the five-year Olympic moving average of past prices times the five-year Olympic moving average of past yields, but the price entering its price component for any year cannot fall below the fixed PLC reference price. ARC provides assistance of at least limited duration against multiple year losses because a lagged moving average adjusts more slowly than the market in a period of sharply declining revenue and because of the reference price minimum on its price component.

It is unlikely the 2014 farm bill would have been enacted without the four distinct programs favored by various crops and regions. The Midwest, upper Plain states, and South, in general favored the policy design of ARC-CO, ARC-IC, and PLC (complemented by SCO), respectively. Rather than force a common program, the 2014 farm bill allows a one-time irrevocable choice, to be made by the end of March 2015 for the 2014-18 crop years.

The multi-program outcome implies several farm safety net design issues remain open. For shallow losses, they include whether assistance should be delivered by insurance (SCO) or commodity programs (ARC) and whether farmers should co-pay a share of a premium or receive payment on only a share of acres. For multiple year losses, an important design issue is whether downside risk is capped at a lower value in exchange for assistance for declines in price or

³ ARC differs from ACRE on several key parameters. ARC pays on a share of historic program acres while ACRE generally paid on a share of planted acres. ARC uses county or farm yield; ACRE used state yield. The coverage range is narrower for ARC. The price component for ARC eliminates the impact of highest and lowest years on its revenue benchmark but was a simple two-year moving average for ACRE and ARCE had no floor on its price component.

revenue from higher levels. PLC provides assistance for low prices that range from the reference price down to the much lower loan rate. ARC provides support at prices above the reference price, but only for a narrower range of losses between 14% and 24% of its revenue benchmark. Related multiple year loss design issues include whether the focus should be price or revenue and whether policy parameters should be fixed or move with the market. Farm policy has been trending toward targets that move with the market, as illustrated by the increased role of crop insurance and ACRE's moving-average revenue benchmark. Yet a strong proclivity remains among many farm groups and in Congress for fixed parameters to provide downside risk assistance. Its strength is demonstrated by the integration of reference prices into the ARC benchmark.

The inter-temporal support outcomes farmers may face can be illustrated with U.S. yield and price projections in the November 10, 2014 World Agricultural Supply and Demand Estimates (WASDE, USDA 2014b). Using the approach of Zulauf and Schnitkey (2014), these estimates are only indicative because they are based on national average, not county or farm, yields and revenue. For corn, at the projected U.S. average yield (170 bushel per planted acre, 13% above the 2009-13 yield Olympic average) and the mid-price of the projected range (\$3.50 per bushel, 36% below the 2009-13 price Olympic average), estimated payment for the 2014 crop year from ARC-CO is at its cap, a level of \$79 per eligible acre, versus payments of \$26 per acre from PLC (Figure 1). Assuming (for simplicity of illustration) that yield and price stay constant at projected 2014 levels through 2018, ARC payments remain \$79 for 2015, decline to \$50 for 2016 and \$0 for 2017 and 2018. In contrast, annual PLC payments do not change.⁴ This simple comparison illustrates the effects of market oriented versus fixed policy parameters; in particular the temporary nature of support from market oriented (moving average) programs.

⁴ Although a simplification from enrollment decisions farmers will make and payments they will receive, SCO does not enter our indicative per acre comparison. SCO was not available for the 2014 crop. Even if it had been, for corn, in particular, SCO payments would not have been triggered at national average prices and yields (with prices falling during the growing season but higher yields, average insured revenue per planted acre at harvest was less than pre-plant expected revenue, but not sufficiently to trigger SCO payments). For subsequent years in our comparison, payments from SCO are precluded by the simplifying assumption for illustrative purposes of constant prices and yields.

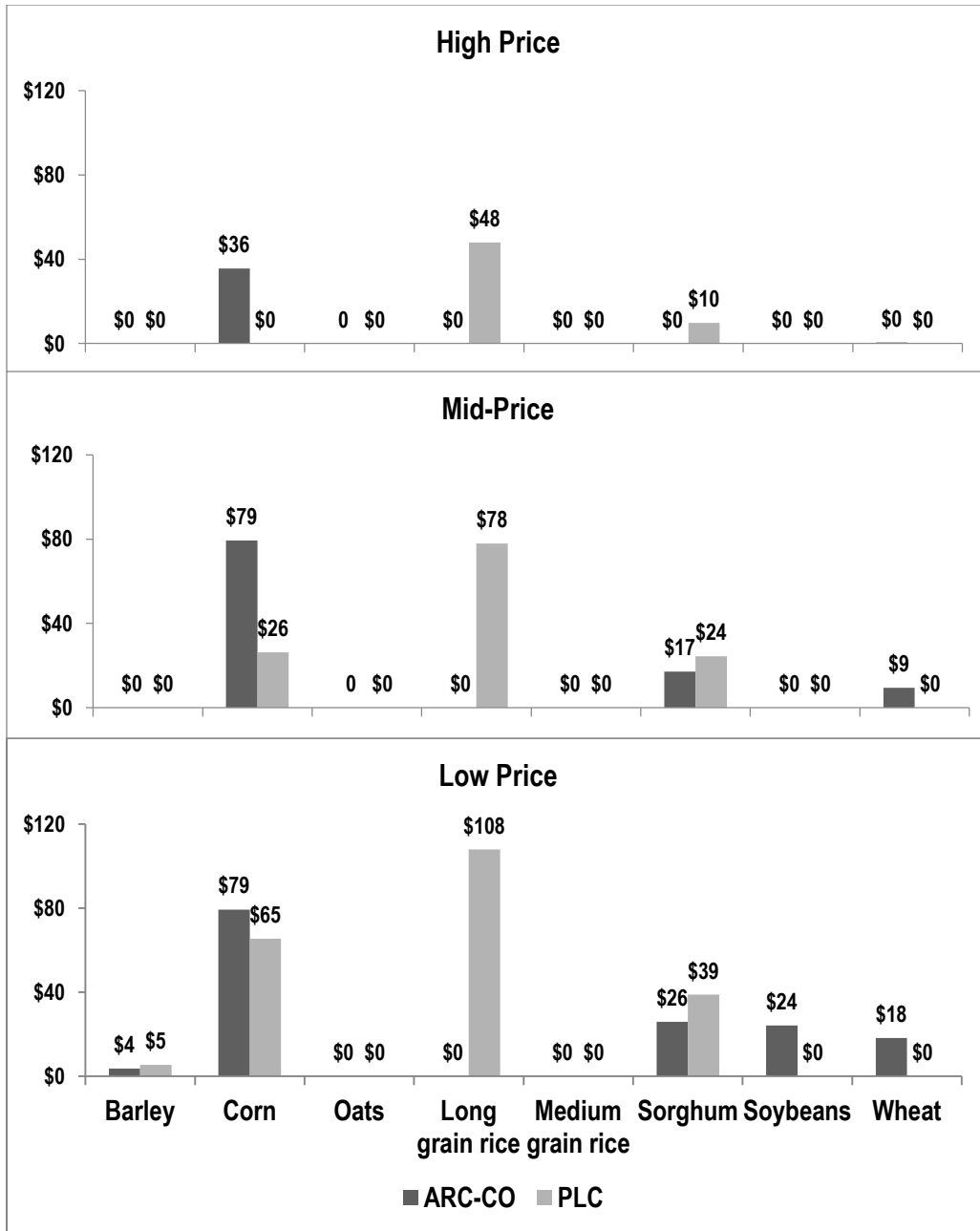


Figure 1. Estimated 2014 crop year ARC-CO and PLC payment per acre using November 2014 WASDE U.S. yield and price projections

Source: Authors' calculations.

Other crops estimated to receive payments for the 2014 crop year at the mid-price projections are sorghum and wheat from ARC-CO and long grain rice and sorghum from PLC. Payments by ARC-CO for corn and PLC for long grain rice are consistent with positions representatives of these crops took during the 2014 farm bill debate. Estimated PLC payments for corn and no payment for medium/short grain rice illustrate both the uncertainty of payments and that outcomes may not align with lobbying positions.

Estimated payments per acre also vary substantially across the WASDE projected price range. At the low-price projection for corn (\$3.20), estimated payments for PLC for the 2014 crop year increase to \$65 per acre but remains capped at \$79 for ARC. At the high-price projection for corn (\$3.80), payments drop to \$36 per acre for ARC and disappear for PLC.

The notable differences in per acre payments imply a wide range of possible total program costs. At the November 2014 WASDE mid-price projections for the 2014 crop year, ARC-CO costs are \$6.3 billion (\$5.7 billion for corn) and PLC costs are \$0.5 billion if all eligible acres are enrolled in the program that makes the largest per acre payment. Total costs are \$2.4 billion for the 2014 crop year if all acres for all crops are enrolled in PLC. If price projections for the 2014 crop remain at the November levels through March 2015, producers may have to decide in their program enrollment decisions whether they prefer support from ARC-CO that, for corn in particular, likely will make large payments in 2015 and 2016; or support that is retained through the 2018 crop year under PLC in the event of market prices below the reference prices that may or may not materialize over the five years of the farm bill.⁵ The likelihood of choosing ARC-CO declines with lower prices (from mid to low) for crop year 2014 because there is less short-term advantage and continuation of low prices will seem more likely. Congress has often added support if prices and revenue are sharply lower than anticipated when a farm bill is enacted, as in 1998. But this may prove more difficult to orchestrate politically, at least through 2018, after farmers have made program choices under the stipulation that their decisions cannot be reversed.

⁵ This decision would be acute for corn as follows. Under our simplifying assumptions, corn payments for the 2014 crop with all acres enrolled in ARC-CO would exceed payments if all corn acreage was enrolled in PLC by \$3.8 billion at the November WASDE mid-price, but only by \$0.9 billion at the WASDE low price. Over the five years 2014-18, ARC-CO payments would exceed PLC payments for corn by \$5.6 billion at the mid-price, but would be less than PLC payments by \$5.4 billion at the low price. We don't extend the analysis beyond the 2018 crop year, but under our simplifying assumptions the baseline of expected payments for a subsequent farm bill also is lower if farmers enroll in ARC-CO.

Expansion of Insurance

Insurance expenditures, which include premium subsidies, administrative and operating cost reimbursements to private insurance companies and government reinsurance for underwriting gains and losses, are estimated by CBO to increase by \$5.7 billion under the 2014 farm bill (Table 5). The evolution since 1980 of crop insurance into a pillar of the farm safety net and several policy issues raised by subsidized insurance are discussed in the appendix.

Other than a loan program, the 2014 farm bill supports cotton only by insurance, including the new shallow loss Stacked Income Protection Plan (STAX). The redesign of cotton support compared to other program crops was driven in large part by the WTO Brazil-U.S. cotton case. In particular, Brazil opposed any fixed reference price for upland cotton, whether through PLC or by incorporation into insurance products. The U.S. cotton industry endorsed replacement of its traditional programs by STAX, both as necessary to seek resolution with Brazil and in anticipation of net indemnities projected by CBO at nearly \$3 billion over 10 years. Additional payments will be made if cotton prices fall below the loan rate.

On October 1, 2014, Brazil and the U.S. reached agreement on termination of the long WTO dispute (Schnepf 2014). While this is an institutional success of the 2014 farm bill, the enhanced reliance on insurance raises a number of policy issues. Insurance products do not address multiple year price and revenue risks. If cotton prices were to stay low for several years, any attempt to add assistance (or large loan program payments) could test whether resolution of the WTO cotton case is a meaningful check on U.S. farm policy.

Introduction of the highly-subsidized STAX insurance program specific to upland cotton also may signal the Balkanization of crop insurance as farm bills become a legislative vehicle to negotiate insurance plans differentiated by crop. Its subsidy rate of 80% exceeds the 44% rate for 90% area revenue insurance, 53% for the popular enterprise insurance at its 85% highest coverage level, and the overall average subsidy rate of 62% for existing insurance. Using the argument that the same program was offered to all crops, the U.S. had notified crop insurance expenditures to the WTO as non-product-specific support (net indemnities were notified from 1995 until 2007, then premium subsidies from 2008 onward). STAX is clearly product specific and arguments have long been made for other crops that the U.S. crop insurance subsidies are product specific (Zulauf and Orden 2014). In a decision supposedly not directly related to enactment of the 2014 farm bill, in November 2014 the U.S. indicated it would begin to notify all

crop insurance premium subsidies, not just STAX subsidies, as product-specific support. This change to how insurance subsidies will be notified further opens the door to legislating differences among insurance products for different crops.

In eliminating the cotton direct payment and countercyclical programs, Congress converted 17.9 million cotton base acres to generic base acres. These acres can be planted to any program crop and receive payments by the program elected for that crop. Thus, for generic base acres, program payments may distort planting decisions. Using 2013 USDA cost of production data, returns for nine alternative crops suggest generic base acres may lead to more planted rice and peanuts acres if market prices for program crops are below their reference prices and returns for cotton are low. To put the potential impact in perspective, in 2012 the U.S. planted 2.7 and 1.6 million acres of rice and peanuts, respectively, compared with 11.6 million acres on average to upland cotton over 2010-14.

Margin insurance also raises issues. The 2014 farm bill authorizes margin insurance for crops, with a program for rice required in 2015. The new dairy MPP, while a Title I commodity program not a Title II insurance program, provides milk-to-feed cost margin protection from \$4 to \$8 per hundredweight and producers can cover 25% - 90% of their historic milk production.⁶ Farm organizations have tried to reintroduce production costs into safety net programs ever since cost of production adjustment for target prices was removed in the 1980 farm bill. While only initial steps are taken in the 2014 farm bill, it is reasonable to consider that margin insurance might evolve into a dominant insurance product.

A potential issue with margin insurance is the existence of large economies of size in costs of production. For dairy, using USDA cost and return data, the cost per hundredweight of producing milk above feed cost declines from nearly \$30 for herds of less than 50 cows to under \$7 for herds of more than 1000 cows. The highest insurable \$8 MPP margin is effectively less than \$6 given a premium of \$1.36 and coverage of 90% of historic production. Nevertheless, the variation in cost among farms and likelihood that non-feed cost per hundredweight continue to decline for larger dairies raise the question of whether MPP guarantees a profit to some farms. A guaranteed profit to large dairy farms would distort the structure of production.

⁶ MPP authorizes government purchases of dairy products to raise prices when margin guarantee payments are triggered (Table 3). An alternative proposal to include supply control measures to manage MPP costs proved controversial and was not adopted.

The level of subsidies for crop insurance is a more general issue. As the 2014 farm bill attests, subsidized crop insurance is strongly supported by farmers and in the political arena. Yet, economic analysis is divided over whether any rationale exists for these subsidies (Coble and Barnett 2012, Goodwin and Smith 2012).

As discussed in the appendix, the need for public subsidies so crop insurance is available rests upon the cost of providing private insurance exceeding farmers' willingness to pay for it. The two most commonly-cited reasons for the high cost of private crop insurance are significant moral hazard and adverse selection in crop production and high levels of systemic risk. Even if the argument that crop insurance merits subsidies is accepted, significant opportunities exist to reduce crop insurance's current cost.

Moral hazard and adverse selection can be managed using data based on yields of individual farms. Cooper *et al.* (2012) find individual farm yield histories are preferable to current methods USDA's Risk Management Agency (RMA) uses to set premium rates. In contrast, RMA's current method largely reflects county level risk. Using a simulation model incorporating a stylized version of current RMA methods, Cooper *et al.* find an average subsidy rate of approximately 35% is sufficient to have 80% of land insured.

It is well established that idiosyncratic risk can be managed by private insurance markets and thus is not a rationale for public subsidies. Empirical evidence from both the aggregate performance of U.S. crop insurance (see the appendix) and individual farm level (Zulauf *et al.* 2013) suggest systemic risk is at most 45% of total risk in U.S. crop production. A rule-of-thumb argument might be that the average subsidy rate should not exceed the share of risk that is systemic, which is notably smaller than the current subsidy rate.

Conservation, SNAP and the Broader Farm Bill Coalition

Provisions to bring together a broad political coalition are evident throughout the 2014 farm bill. The environmental focus to farm policy continues. This is the first farm bill enacted with projected spending higher on the conservation title than the commodity title. Only \$208 million of the projected 10-year reductions to conservation program budget authority are slated to occur within the five-year duration of the farm bill. Wetland and highly erodible land conservation are expanded as a condition to receive crop insurance premium subsidies. This latter provision underscores a basic political equilibrium reached in 2014—that crop insurance

cannot be both a farm safety net pillar and excluded from the expectation that farmers protect the environment in exchange for subsidies.

The maximum number of acres in the Conservation Reserve Program (CRP) is reduced but the cap is still 24 million acres in 2018. Thus, both the 2008 and 2014 farm bills continued a program whose elimination could have addressed concerns over high crop prices, in contrast to a fence row-to-fence row planting mentality that dominated during the 1970s period of farm prosperity. The conservation focus is further reinforced by increased CRP acreage in continuous sign-up, continued conservation programs for working lands and livestock facilities, and restored funding that had elapsed under the 2008 farm bill for conservation easements (Ludden and Peace 2014).

A key rural/urban coalition—between stakeholders in farm support and domestic food assistance programs—survived in 2014 despite intense pressure from political conservatives to reduce expenditures on entitlements and the short-lived separation of nutrition from the farm bill by the House of Representatives. The 2014 farm bill was scored by CBO to reduce projected SNAP outlays by only \$8 billion over 10 years, roughly 1%.

An expanding farm/environment/food assistance coalition will be important to the political economy of future farm bills. Opportunities to expand this coalition abound, but so too do challenges, as the U.S. grapples with issues over the role of farm production in nutrition, health, and environmental quality and government programs and regulations in these areas. The consolidated Regional Conservation Partnership Program in the 2014 farm bill provides one avenue for coalition-building opportunities by allowing local, regional or watershed environmental issues to be identified and addressed by leveraging public with private funds.

The 2014 farm bill strengthened other coalition partnerships as well. Combined projected outlays for the forestry, trade, rural development, horticulture, energy, miscellaneous, and research/extension titles increase \$4 billion (39%) over 10 years. The farm safety net was extended to more crops and livestock. Notably, disaster aid for livestock, farm-raised catfish, honeybees, orchard trees and nursery stock temporarily authorized in the 2008 farm bill was made permanent at a projected cost of \$3.7 billion.

Important to the farm bill coalition is the retention of permanent legislation. Over 250 diverse organizations jointly urged Congress to retain this legislative framework. What they

recognize is that permanent legislation creates a powerful incentive to pass a new farm bill, thus providing multiple opportunities to pursue their agendas.

WTO Considerations

While the Doha Round negotiation has faltered, compliance of the U.S. farm safety net programs with the existing WTO disciplines or tighter disciplines that could be negotiated remains an issue. Since ARC-CO and PLC make payments on historic program acres with planting flexibility, they likely will be notified as non-product-specific support. We conclude from simple analysis along lines of our WASDE-based calculations that notified non-product-specific expenditures under the 2014 farm bill are unlikely to exceed the *de minimis* threshold of 5% of total value of agricultural production, and hence to count against the U.S. constraint of \$19.1 billion annually on certain domestic support (Zulauf and Orden 2014).⁷ The U.S. decision in 2014 to start notifying crop insurance premium subsidies as product-specific support, removes these support expenditures from the non-product-specific category, making it even less likely than before that ARC and PLC payments will cause the *de minimis* threshold for non-product-specific support to be exceeded. On this basis, we conclude it is unlikely the U.S. will face difficulty meeting its current WTO obligations.

Expenditures under the 2014 farm bill are more likely to exceed several of the proposed limits of the tighter rules and commitments on developed country domestic support under discussion in the December 2008 Doha Round negotiations. The existing support cap would be reduced and product-specific caps established, the *de minimis* threshold would fall to 2.5% of total value of production, an aggregate limit and product-specific caps would be placed on the blue box, and blue box and *de minimis* expenditures would count against a new proposed limit on overall trade-distorting support (Brink 2011). It seems reasonable to conclude that the U.S. would not have enacted the 2014 farm bill as it is, had a Doha agreement been reached in 2008 and phased in over the past six years. Conversely, enactment of this farm bill makes it more difficult for the U.S. to contribute to attaining such limits on a global level in future negotiations.

In contrast, the Brazil-U.S. cotton case may have impacts beyond the U.S. upland cotton safety net. A core complaint by Brazil was that the WTO Agreement on Subsidies and Countervailing Measures specifies that sector-specific government programs cannot cause serious prejudice to the interests of another member by significantly suppressing world prices or

⁷ STAX, MPP, payments on generic acres and possibly ARC-IC are likely to be notified as product-specific support.

otherwise significantly distorting market conditions. By extension, the cotton ruling suggests PLC could be subject to potential WTO challenge if U.S. prices stay below the reference price for an extended period. The ruling also suggests grounds may exist to file a complaint if total U.S. subsidies, including insurance, for a given crop distort trade or suppress world prices. An important policy question that could emerge from such cases is whether the declining level of support associated with moving-average programs such as ARC would be considered in determining trade distortion.

Conclusions

The U.S. farm lobby and broader farm bill coalition demonstrated their continued political power by securing a new farm bill in 2014 under difficult circumstances. A long period of crop prosperity did not bring an end to U.S. support. While not an ironclad assurance on funding, coalition partners now have their basic mandatory programs in place. The farm lobby may receive less support or more support from the enhanced downside risk safety net than from the fixed direct payments it gave up, a one-time card it has played. If expenditures prove lower, eighteen years of fixed direct payments may be the transition out of commodity programs once envisioned by reform advocates. If costs prove higher, it is unclear whether pressure to cut spending will be felt as fiscal deficits fall to a smaller share of GDP in coming years. Moreover, the permanence of permanent farm policy legislation was on display, giving farm and other stakeholders an advantage in securing a next farm bill.

The *Agricultural Act of 2014* both addresses and creates issues in this political economy context. ARC is put on a more even footing with the traditional price countercyclical program than ACRE was in the 2008 farm bill. It is not surprising that a moving-average revenue benchmark program gained stature at a time of high prices and revenue. If expected 2014 crop year prices are not so low through March 2014 as to cause ARC to be stillborn, the 2014 farm bill will provide experience and evidence about whether U.S. farm policy can move further from fixed policy parameters, trading a lower cap on downside risk protection for assistance with declines in price and revenue from higher levels.

A success of the 2014 farm bill is the termination of the WTO Brazil-U.S upland cotton case made possible by shifting from traditional commodity programs to the STAX insurance program. Yet, creation of generic base acres will fuel further debate on decoupling and potentially foreshadows additional lobbying for a return to support tied to current production.

STAX may prove costly and upland cotton having a loan rate as its only multiple year loss protection may not hold up. More broadly, the whole structure of available insurance products needs to be monitored. The parameters and size of the public subsidies for insurance could come up and, we argue, should be taken up in the next farm bill debate, if not earlier.

Finally, we have noted two broader contexts that surround the 2014 farm bill. The first is certain optimism that the conservation focus remains central to farm policy and that the 2014 farm bill provides pathways for tackling some of the contentious nutrition, health and environmental policy and regulatory issues surrounding agriculture. Conversely, the 2014 farm bill exacerbates efforts to achieve tighter multilateral disciplines on agricultural support and protection. The U.S. may come to rue this outcome if it leads to impasses on regional trade agreements currently on the table or if newly emerging middle-income countries follow the historical pattern of expanding market-distorting support for their agriculture.

Appendix: Crop Insurance

The high level of spending on crop insurance during 2011-13, along with policy changes in the *Agricultural Act of 2014*, has stimulated debate over the cost of crop insurance. In particular, economists do not agree if any economic rationale exists to justify public subsidies for crop insurance. From the perspective of economics, provision of these subsidies rest upon the argument that private crop insurance would not be offered without subsidies because the cost of providing private insurance exceeds farmers' willingness to pay for it. The high cost of private crop insurance is commonly attributed to the presence of high reserve load costs resulting from the presence of high administrative costs due to the site specific nature of yield, including the cost of monitoring moral hazard and adverse selection, and to the existence of large systemic losses from widespread weather events (Coble and Barnett 2012).

In this appendix, we do not attempt to answer the broadest policy question of whether crop insurance subsidies are justifiable economically. Instead, we focus on the narrower question of the implication of the two high cost components of private insurance for public subsidies. Although the 2014 farm bill enhances crop insurance programs, our assessment is that U.S. crop insurance is currently over-subsidized even if subsidies are accepted as economically justified.

Background

The 2014 farm bill enhances public assistance via crop insurance for production-period (pre-planting to harvest) risk, a trend that dates to the early 1980s. Crop insurance operates over the growing season, insuring against losses at harvest compared with expectations before planting. Its yield and price components are reset each year. The growing role of insurance in the U.S. crop safety net reflects in part a shift from yield loss to revenue loss insurance (Figure A.1). Revenue insurance was not offered until the 1996 crop year but now accounts for 85% of insured acres.

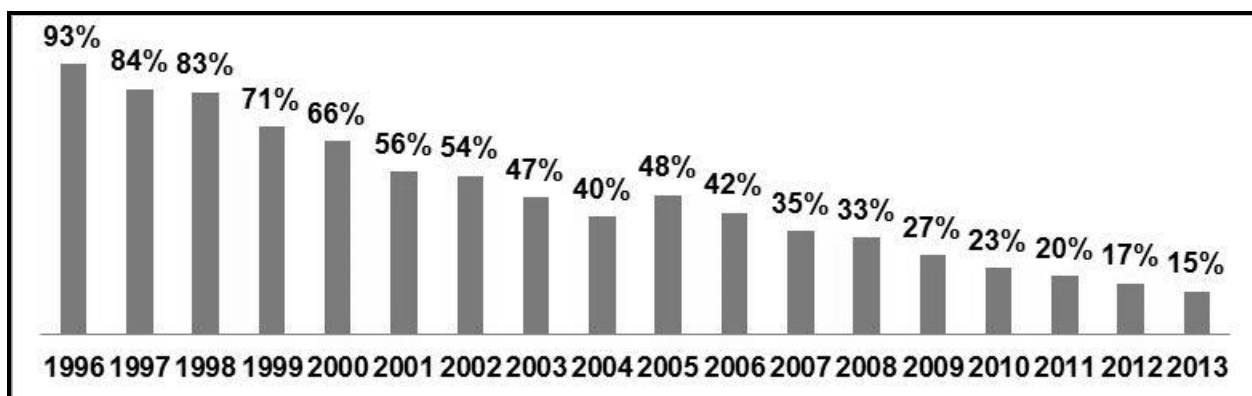


Figure A.1. Share of all insured acres in yield insurance, all crops, U.S., 1996-2013

Source: Authors' calculations using data from USDA, Risk Management Agency.

Note: Yield insurance contracts include Actual Production History (APH), Group Risk Plan (GRP), and Yield Protection (YP).

Net indemnity payments for insured crop losses (indemnity payments less the premiums paid by farmers) since 2004 are shown in Figure A.2. Although net indemnities spiked in 2008, they were generally a relatively small component of total farm support expenditures through 2010. However, in each of the 2011 through 2013 crop years, net indemnity insurance payments to U.S. farms exceeded \$6 billion, and thus were larger than direct payments.⁸

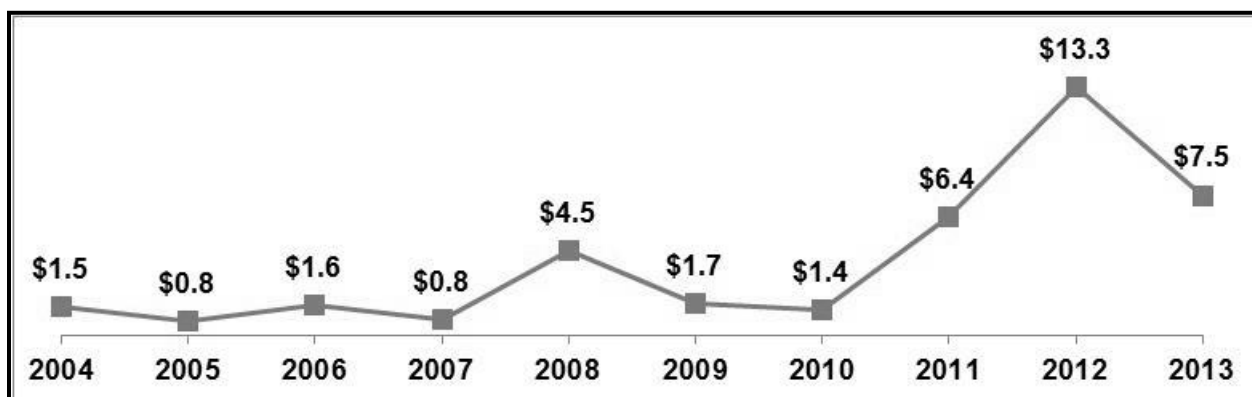


Figure A.2. Net indemnity payments from U.S. crop insurance, 2004-2013 (billion dollars)

Source: Authors' calculations using data from USDA, Risk Management Agency.

Higher net insurance payments reflect in part higher public subsidy rates. The share of premiums paid by farms declined from 74% in the early 1990s to around 38% in recent years (Figure A.3). Major changes in subsidy rates occurred in the *Agricultural Risk Protection Act of*

⁸ Even though insurance payments exceed farmer-paid insurance premiums summed for all U.S. farms, insurance payments do not exceed premiums paid by each farm that buys crop insurance. An individual farm receives an insurance payment only if it experiences a loss greater than the deductible it elected.

2000 and the 2008 farm bill. The latter made the subsidy rate as high as 80% on some coverage levels for enterprise insurance (an enterprise is all acres of a crop of a farm operation in a county). The higher subsidy rate, combined with an expansion in eligible crops and types of insurance, has resulted in more farms buying insurance on more acres. Total insured acres grew from 100 million in the early 1990s to 296 million in the 2013 crop year. A third reason for higher net insurance payments since 2008 is higher crop prices. Higher prices translate into higher expected revenue and thus more insurance payments for a given percentage loss.

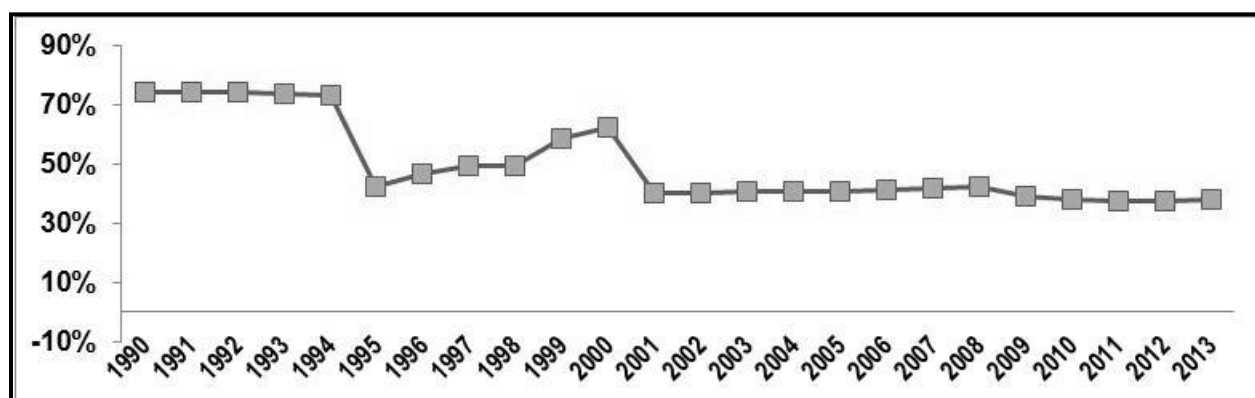


Figure A.3. Share of insurance premiums paid by farmers, U.S., 1990-2013

Source: Authors' calculations using data from USDA, Risk Management Agency.

Net indemnity payments to farms are only part of the cost to the public of farm insurance programs. The cost of government reinsurance provided to private insurance companies (net underwriting gains and losses) plus government reimbursement to private insurance companies for administration and operation (A&O) costs averaged nearly \$1.9 billion annually for the 2009-2013 fiscal years (Shields 2013).

Policy Issues

The debate over crop insurance subsidies is framed in part by five observations:

1. Other than private hail and fire insurance, U.S. farmers (and farmers around the world) have only purchased crop insurance to any notable extent when public subsidies exist (Wright and Hewitt 1994, Tweeten and Zulauf 1997).
2. The higher the subsidy rate the more insurance farmers buy.
3. The U.S. Congress has demonstrated a willingness to increasingly subsidize crop insurance.
4. Economists are divided over the rationale, if any, for crop insurance subsidies.

5. No objective-based rationale has been given for the current matrix of subsidies by product and coverage level—it is a political equilibrium matrix negotiated by Congress.

In assessing crop insurance subsidies, it is useful to start with the question, why is farm fire and hail insurance unsubsidized? Fire and hail risk events can substantially reduce yield and revenue, but occur infrequently on a given acre of land. Hail events can affect more than one field in a local area and thus can be spatially correlated. Nevertheless, fire and hail approximate idiosyncratic risks or risks with little correlation of occurrence across potential insurance units. The lack of correlation allows the law of large numbers to be invoked, in turn allowing an actuarially fair premium to be determined and charged. In summary, as reflected by the lack of public subsidies for fire and hail insurance, no economic justification exists for public subsidies for idiosyncratic risk. Private markets can cost effectively deliver such insurance.

Moral Hazard and Adverse Selection as Arguments for Crop Insurance Subsidies

Moral hazard exists when a risk management option alters decisions of the insured so as to increase the probability of collecting a payment. Adverse selection exists when potential users of the risk management option know more about their losses than the provider, allowing them to choose a risk management option when its payout ratio is favorable. Thus, moral hazard and adverse selection increase the cost of private market risk management options. If these costs are high enough, the type of insurance may be affected or insurance may not be offered.

Moral hazard and adverse selection are especially likely in a complex process such as crop production. Farmers make many decisions from planting through harvest that include consideration of risk. Thus, the potential is high that availability of insurance could influence farmers' decisions and that farmers know more about their risks than insurance providers.

Moral hazard and adverse selection are less likely when determinant of payments by risk management programs is outside the control of the insured (Miranda 1991). Hence, area-wide insurance, such as county insurance, is often championed as a way to reduce moral hazard and adverse selection. However, during the 2013 crop year, county insurance products accounted for only 1.4% of insured U.S. acres.

Moral hazard and adverse selection exist for all private insurance. Techniques for managing them include premiums, co-pays, and deductibles as well as using information to price the riskiness of individual insurance units. Similar tools are available for individual farm crop

insurance contracts, including information about the riskiness of production by individual field and individual farmer.

It is not certain how many observations are needed to address the issues of moral hazard and adverse selection, but data for many fields and farmers in the U.S. now exceeds 10 years. This ever-growing data set might allow the use of statistical techniques to combine county and farm specific data to calculate field and farmer specific insurance rates. Cooper *et al.* (2012) examines this approach. They find individual farm yield histories are preferable to current methods used by USDA, RMA to set premium rates. This finding is consistent with observations made by Goodwin (1994) that individual yield histories allow premiums to reflect risk attributes that are idiosyncratic to the operator and land. In contrast, the current method used by RMA largely reflects county level risk. Using a simulation model incorporating a stylized version of current RMA methods, Cooper *et al.* (2012) find an average subsidy rate of approximately 35% is needed so that 80% of land is insured. Their data set is seven county-crop combinations with enough farm level data from the Illinois and Kansas farm management data sets to complete the analysis. At the time of their study, approximately 80% of U.S. cropland was insured.

Systemic Risk as an Argument for Crop Insurance Subsidies

Crop farms are subject to considerable systemic risk or risk that is correlated or held in common by a large number of potential insurance units. Systemic yield risk arises from widespread natural events such as frost, drought, and excess moisture affecting contiguous geographic regions. Systemic price risk arises from both market demand factors and national and international weather conditions. Miranda and Glauber (1997) find that the portfolios of U.S. crop insurers are 20 to 50 times riskier than if yields are stochastically independent across farms. They also find that their portfolio risks are 10 times larger than private insurers offering more conventional insurance lines.

Occurrence of a systemic risk potentially affects enough insured units to cause insurance companies to go bankrupt, which in turn may lead to under-provision, even lack of private insurance. The counter-argument against providing subsidies for crop insurance when systemic risk exists is that the international reinsurance market is large enough to handle the systemic risk associated with crop insurance (Goodwin and Smith 2012). However, private reinsurance can be expensive and may not be available. Currently, the U.S. government provides a considerable share of reinsurance for companies offering crop insurance to U.S. farms.

The disagreement over the validity of the systemic risk justification for public subsidies for crop insurance should not cloud the prevailing assessment of economics that idiosyncratic risk should not be subsidized. This observation implies an important policy question: How much risk in U.S. crop production is idiosyncratic? Perspective on this question can be gained by examining the share of crop insurance premiums paid as indemnities for losses in various years.

Over the last 10 crop years, a period in which revenue insurance was the dominant insurance product, the ratio of insurance indemnity payments to total premiums (farmer-paid premiums plus premium subsidies) was lowest in 2007 (0.54) and 2010 (0.56), as shown in Figure A.4. Systemic risk was likely low in these two years. Corn, rice, sorghum, soybeans, upland cotton, and wheat accounted for 70% and 79% of insured acres in 2007 and 2010, respectively. In only two of the 12 combinations involving these two years and six crops was U.S. average insured revenue per planted acre at harvest (harvest insurance price times U.S. yield per planted acre) less than the pre-plant expected revenue (pre-plant insurance price times average U.S. yield per planted acre for the 10 preceding crop years). The two exceptions were only -5% for corn in 2007 and -3% for rice in 2010.

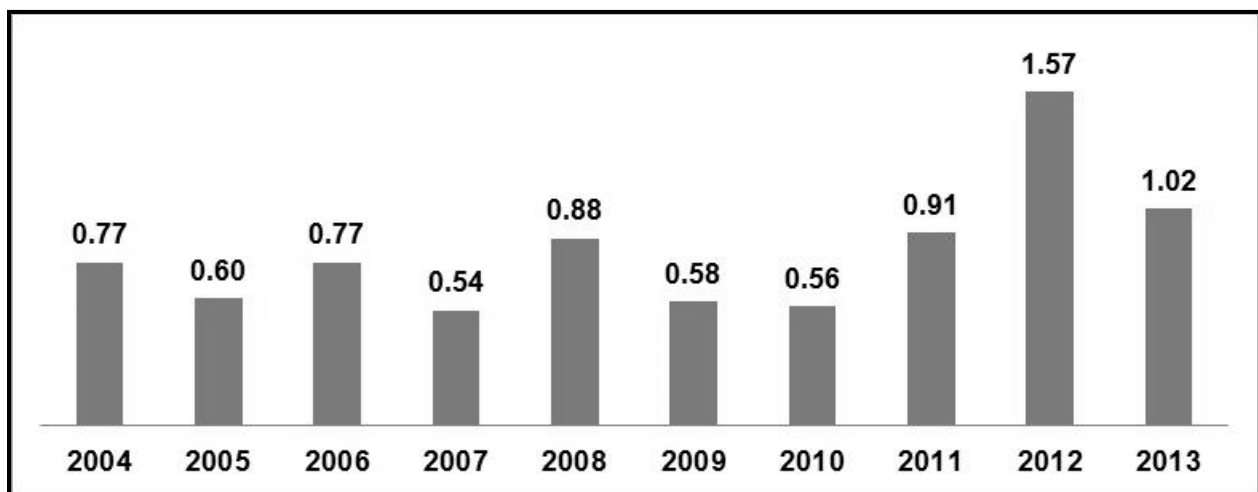


Figure A.4. Ratio of crop insurance indemnity payments to total insurance premiums, U.S., crop years 2004–2013

Source: Authors' calculations using data from U. S. Department of Agriculture, Risk Management Agency.

If all losses in 2007 and 2010 are assumed to result from idiosyncratic risk, then idiosyncratic risk is 55% of all risk in U.S. crop agriculture. Under the argument that idiosyncratic risk should not be subsidized and the assumption that 2007 and 2010 had minimal

systemic risk, the 2007 and 2010 observations imply the average U.S. crop insurance subsidy rate should not exceed 45%. In contrast, the average subsidy rate for crop insurance purchased by U.S. farmers in 2013 was 62%.

In a different approach, Zulauf *et al.* (2013) calculated the share of crop revenue loss that is systemic with revenue loss at the county level for Illinois and Kansas management association farms over the 1977 through 2012 crop years. The losses were generated by yield and price risks that occurred between the months in which the pre-plant and harvest insurance prices were determined. Insured revenue loss per acre for the farm and the county in which the farm is located was calculated as follows:

$$(1) \quad (\text{pre-plant insurance price}_t \bullet 5\text{-year average of past yield}_{i,t} \bullet \text{coverage level}) - (\text{harvest insurance price}_t \bullet \text{yield}_{i,t})$$

where t = year, i = farm or county, and the insurance coverage level is 85%, 70%, or 50% (losses greater than 15%, 30%, and 50%, respectively). The highest level of individual insurance a farm can buy is 85% while the lowest is 50%. Crops examined were corn, soybeans, and wheat for both Illinois and Kansas, as well as sorghum for Kansas. Share of farm loss systemic with the county was calculated as the minimum (farm loss or county loss), expressed as a share of farm loss.

Across the crops, the share of farm loss systemic with county loss averaged 46% for Illinois and 50% for Kansas for farm losses greater than 15% (see Table A.1). Average share declines to 29% and 11% for Illinois and 42% and 30% for Kansas at losses exceeding 30% and 50%, respectively. Thus, the role of systemic risk increases as the size of the loss decreases.

Again, the share of risk that is systemic, even at the smallest loss level, is less than the current average subsidy level for U.S. crop insurance. Moreover, average subsidy level of enterprise insurance, a commonly purchased insurance product, is 80% at the 50% and 70% coverage levels but only 53% at the 85% coverage level. The same pattern of decreasing subsidy levels for higher level of coverage exists for other insurance products. In summary, over-subsidization of existing insurance products increases as the level of loss increases when evaluated from the perspective of the share of risk that is systemic.

Table A.1. Share of per acre average Annual Farm Revenue Loss Systemic with County Revenue Loss, Selected Loss Levels, Illinois and Kansas Farm Management Association Farms, 1977-2012

State and Crop	Loss > 15%	Loss > 30%	Loss > 50%
Illinois			
Corn for grain	43%	29%	23%
Soybeans	43%	15%	0%
Wheat	51%	42%	10%
Average	46%	29%	11%
Kansas			
Corn for grain	48%	38%	27%
Sorghum	48%	39%	29%
Soybeans	56%	46%	29%
Wheat	48%	43%	35%
Average	50%	42%	30%

Source: Zulauf, *et al.* (2013).

In additional analysis, Zulauf *et al.* (2013) find that these results hold for the share of loss that is systemic from the perspective of yield and at other coverage (loss) levels. They also find that the systemic portion of farm risk is lower when evaluated at the state or national level, which might be more relevant to systemic risk causing large losses to private insurers.

Last, an unexpected finding was that the share of risk systemic with the county is generally higher for Kansas than for Illinois, especially at the higher loss levels. Conventional wisdom is that Illinois has more systemic risk, at least for corn and soybeans, since it is a core production area. What this finding likely illustrates is the importance of the variability of weather and the agronomic production environment across space. For example, within a given crop year, rainfall may be more variable within Illinois than Kansas counties, resulting in a lower share of loss being systemic with the county.

Production, Management, and Environmental Impacts of Subsidized Crop Insurance

Even if the systemic risk and moral hazard/adverse selection arguments for publically subsidized insurance are accepted, they are not a full rationale for adopting policy. Adoption depends upon all costs and benefits of a policy.⁹ Publically subsidized insurance affects production,

⁹Tangermann (2011) makes a similar point. He divides risk into three categories. His “catastrophic risks,” which “can be considered the market failure level,” correspond most closely to what we describe as systemic risk.

management and the environment. The assessment of those impacts that follows is similar in part to the review in Sumner and Zulauf (2012).

Publically subsidized insurance may encourage production and suppress price for three reasons (Nelson and Loehman 1987). First, because farmers do not pay the full cost of insurance and because financiers may reduce the cost of operating loans due to a lower chance of default, expected income is higher. Higher net income increases the incentive to plant insured crops, especially crops with higher premium subsidy rates. This impact is similar to that of a price subsidy. Second, risk-averse farmers may plant more acres with insured crops in areas of significant production risk because insurance reduces the financial consequences of large yield losses. Third, because the need to manage large losses is reduced, farmers may focus on increasing average productivity.

Based on a simulation analysis, LaFrance, Shimshack, and Wu (2002) conclude that insurance will not affect land use only when it is actuarially sound and unsubsidized. Lubowski *et al.* (2006) conclude that based on empirical analysis of crop insurance participation and land use, the increase in insurance subsidies during the mid-1990s caused cultivated cropland to increase an estimated 2.5 million acres (0.8%) in the 48 contiguous U.S. states in 1997. Goodwin, Vandever, and Deal (2004) found that a 30% decrease in premiums caused less than a 1% increase in Midwest corn acres and about a 1% increase in Northern Plain barley acres. Young, Vandever, and Schnepf (2001) also find positive but small production effects. Last, both Babcock and Hennessey (1996) and Smith and Goodwin (1996) report that yield insurance has a small, positive impact on input use.

Risk compensation is another set of distortions resulting from publically subsidized insurance. Risk compensation, which has gained increasing recognition in recent years, is the replacement, in part or whole, of one risk by another risk. For example, publically subsidized insurance may reduce a farmer's incentive to use other risk-mitigating practices, such as crop

Tangermann, following OECD analysis, articulates three principles for risk management programs: (1) that public policy should leave as much space as possible for private risk management activities (in particular, government programs should not absorb risks that farmers can manage themselves); (2) that a holistic approach should be taken to evaluating the efficacy of insurance programs within the full complex of farm support policies; and (3) that the distinction should be clear between providing risk management assistance versus providing support more generally. Tangermann concludes that "it is highly questionable whether subsidies to crop insurance are really appropriate" especially in the context of large direct income transfers as occur in the European Union. The shift from direct income support to strengthened risk protection in the 2014 U.S. farm bill will intensify a debate over European versus U.S. forms of support and their effects on domestic producers and world markets.

diversification and risk-reducing production practices. Both Horowitz and Lichtenberg (1993) and Babcock and Hennessy (1996) find that farmers with insurance use less risk-reducing chemicals. A risk compensation impact widely discussed by farmers is that some farmers use subsidized insurance to increase land rents and bids. Risk compensation raises additional questions about the net benefit of subsidized crop insurance to farmers and society.

Last, because risky production areas can overlap with environmentally sensitive areas, the environmental impact of crop insurance is a policy issue. In the most extensive study to date, Lubowski *et al.* (2006) found that subsidized crop insurance increased wind and water erosion by an estimated 1.4% and 0.9% in 1997.

As a group, these studies suggest the distortions resulting from U.S. crop insurance are not large. A possible explanation is that the insurance price is reset each year to reflect existing market conditions. Thus, insurance does not put a floor under market signals, which mitigates its impact on production. A second possible explanation is the existence of production-related constraints. For example, the ability to expand cropland in the U.S. Midwest is limited. Crop rotation considerations and availability of insurance for most alternative crops in many parts of the United States also likely temper the impact of crop insurance on planting decisions. A third possible explanation is that the studies cited above predate the large increase in both insured acres and subsidy level for U.S. crop insurance. A fourth possible explanation is that previous studies have missed certain channels by which publically subsidized insurance may affect crop production (Henneberry 2014). Those include risk compensation.

In summary, the limited distortions found by existing studies of U.S. crop insurance may or may not be applicable to the current policy and market environment, depending on which of the four proposed explanations are valid and dominant. Additional studies using contemporary data are needed.

Conclusions and Implications

The argument for public subsidies for crop insurance rests upon the observation that, without these subsidies, farmers would not have access to crop insurance. Stated alternatively, farmers' willingness to pay for private crop insurance is less than the cost of providing private insurance, leading to the need for public subsidies to cover the difference. However, economists are divided over whether any rationale exists for crop insurance subsidies.

The two reasons commonly cited for the high cost of private crop insurance are the high level of moral hazard and adverse selection in crop production and the presence of a large degree of systemic risk. This appendix has reviewed both these factors. We conclude that significant opportunities exist to reduce the cost of the current crop insurance program even if the argument that crop insurance would not exist without public subsidies is accepted.

Moral hazard and adverse selection can be managed by making use of the ever-growing data base on the yields of individual farms and land. Using this data to help rate premiums would better align premiums with riskiness at the individual producer and field level.

Idiosyncratic risk is not a rationale for public subsidies since private insurance functions effectively and efficiently in addressing idiosyncratic risk. Empirical evidence is presented from both the aggregate performance of U.S. crop insurance and at the individual farm level that, even if systemic risk is accepted as a rationale for crop insurance subsidies, the current average U.S. subsidy rate is too high.

Combining both actions offers the potential to notably reduce the spending on the premium subsidy for crop insurance. They also offer the potential to better align premium subsidies with the riskiness of individual farmers and individual fields, thus enhancing economic efficiency. The latter action may temper the reduction in the participation in crop insurance from reducing the average premium subsidy by better targeting the premium subsidy so that low risk producers feel crop insurance is a cost effective buy.

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