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The 1996 Farm Bill: Complete Failure or First Attempt?

With recent entries into numerous agreements and associations such as the North American Free Trade Agreement and the World Trade Organization (WTO), there can be no doubt that United States leaders have been following the principles of globalization, and thus free trade. The WTO describes free trade as, "a system of rules dedicated to open, fair, and undistorted competition." This includes the slow elimination or reduction of trade barriers such as quotas and tariffs, but also provides for the protection of intellectual property, outlaws exporting below cost to gain market share, and requires a major reduction, and eventual removal, of government domestic support of industry (Understanding, 12). The United States supports these factors strongly, and it has also been at the forefront urging other nations to do the same. However, there is one sector in particular where its actions ring of hypocrisy: agriculture.

This hypocrisy was glaringly displayed during the WTO Doha Agenda Cancun talks last September. Because it was unresponsive to the request by Benin, Burkina Faso, Chad and Mali to decrease its domestic support to the cotton industry, the United States faced a formal WTO lawsuit in which Brazil charged that the subsidies paid to American cotton farmers violate international trade rules. Without the subsidies, Brazil estimated that United States cotton production would have fallen 29 percent and that American cotton exports would have dropped 41 percent. That would have led to a rise in international cotton prices of 12.6 percent, which would have helped Brazil's cotton farmers (Becker).

What is even more interesting than the actual occurrence of this historic case is Brazil's triumph in the preliminary hearing: a final ruling against the United States could lead to stiff penalties if it fails to change its practices. What's more, nearly all preliminary opinions are eventually upheld by the W.T.O. If this ruling is upheld, and if the objectives of the W.T.O. Doha Agenda are carried through, it will become necessary for the United States to greatly reduce, and even eliminate, much of its domestic support to the agricultural sector.

It cannot be said that an attempt of this nature was not made: in 1996, the Federal Agriculture Improvement and Reform Act (FAIR) was passed with the intentions of slowly weaning farms from much of the traditional domestic support. In the years following its enactment, however, it became apparent that the support offered would not be enough: over $26 billion in Market Loss Assistance payments were distributed from 1998-2001. In 2002 the U.S. returned to levels of prior support: total support to farmers in the United States was $40 billion, of which $15 billion came from consumers and $25 billion from taxpayers. The 2002 Farm Bill is projected to cost around $82.8 billion more than its 1996 predecessor would have allowed (Tangermann). Forgetting the WTO allegations, the sheer cost of such programs is enough to make one wonder if alternate policies could be found.

If it is possible to find a viable solution which will eliminate the high level of domestic support currently offered and still allow for the survival of the agricultural industry, then care must be taken that the mistakes of the past are not repeated. This paper will examine the major policies of the 1996 bill with this goal in mind. It will first describe some major economic reasons that domestic support of the farming sector is

currently deemed necessary, and then describe the traditional types of support offered, both as relevant to the changes made in the 1996-2002 period. It will then discuss the drawbacks of these subsidies both economically and from a world trade standpoint, and the ways the 1996 FAIR act attempted to change the subsidy system. In the end, this paper will show both that the economic assumptions made at the signing of the 1996 bill were invalid and that the major policies of the bill were not carried out according to plan. If success in the implementation of similar bills is to be hoped for, the government must be held accountable to stand by its new policies by an outside source such as the WTO, as well as consider how the new policies will interact with existing farm subsidy programs that were not removed. Much more focus must also be placed on finding and utilizing effective alternate risk strategies. Lastly, if the survival of small and medium farms is considered very important, then some government subsidies must remain in the future, although they do not have to be near as distorting nor large as current programs.

Reasons for Agricultural Support

Agricultural subsidies in the United States had their beginnings in post-New Deal economic thought: the intricacies and special circumstances of agriculture were thought to be such that the sector could not rely on market forces alone to survive in the modern world. As time has progressed, these beliefs have been refined and modified, and in the process the groups and politicians that represent them have become a powerful force in politics. The policies that provide these farm subsidies, and other benefits, have expanded tremendously in the decades following the 1930's to become one of the biggest programs funded by the federal government.

There are several widely held beliefs which are thought to give legitimate reasons for government intervention in agricultural markets. Most follow the idea that agriculture is unique to all other sectors of the economy with certain inherent risks that require government action for its survival at socially desirable levels.

Indeed, agriculture is an industry plagued by risks in almost all facets of its operation. The primary financial risks farmers face involve variations in yields and prices. The level of disparity in yields produced is measured from year to year through the coefficient of variation, which is equal to the standard deviation of the yield divided by its average yield. It is approximately equal to the average proportional difference from the average. On a typical corn, wheat, or soybean field in the United States, the coefficient of variation of year-to-year yields is about .3, meaning that the average field will post a yield of more than 30 percent above or below the historical trend curve, approximately one-third of the time. The coefficient of variation is over 0.2 for most commodities.

The laws of supply and demand dictate that large differences in yields produced each year imply corresponding large variances in the prices of these commodities. These price variances, in fact, are quite a bit larger than those of other products would be due to the extreme inelasticity of agricultural commodities: for the most part, the same consumption of food is required regardless of the price. In fact, the demand for commodities is such that changes in income and consumer preferences are much more likely to alter demand than actual commodity price changes. Because farmers' profits, on average, are only a small portion of their total revenues, the large variability of both

prices and yields implies that, in any single year, a farmer's profits may vary widely for reasons beyond his or her immediate control. (Roberts, 3).

Explanations for this difficulty in stabilizing these year to year variations involve the complexity of controlling the risk. Farmers face situations which are inherently unpredictable and extraordinarily complex in nature. Dealing with weather, soil fertility, pests, optimal irrigation, and world economic conditions, there is an infinite amount of possible events that might occur in one season. There is thus no real way to prepare for all mishaps, and so risks will never be able to be completely accounted for.

Regardless of the ability to effectively mitigate all risks, it is assumed that economic agents do hold some beliefs over the probability that certain events will occur. Although the true probability distribution of an event cannot be known, agents approximate the risk uncertainty in the future with risk functions created by looking at the most common outcomes of the past. If the correct functions can be determined, these approximations can be successful in dealing with the uncertainty of the future. Finding these "risk functions" is not easy, however, or sometimes even possible. When a farmer looks to make decisions at the beginning of planting season, he tries to maximize his profit while dealing with risk in three layers.

The first risk deals with his ability to produce the amount of the commodity that he decides to produce, called yield risk. In this category the farmer must make decisions when he is both unsure of events which he cannot at all control, like the amount of rainfall which will occur that season, and the effects of the use of those he can, such as determining the optimal amount of fertilizer to use. In some cases these risks can be approximated into a linear function, where profit ($\prod$) is maximized when the ideal

production function is placed into the following equation: $\prod(x,s) = s_a + s_b g(x)$: s_a refers to the probability that factors which the farmer cannot control, but which will affect output, will occur, while s_b describes the probability that their choice of inputs will be the correct one to ensure the desired level of output, and g(x) is some profit function. In this special linear case, it follows that the exact inputs can be determined as $E[\prod] = E[s_a] + E[s_b]g(x)$, so that the optimal decisions about x depend only on the expectation of s_a and s_b. Most of the time, however, the properties of s_b do not allow a simple expectation of its value to be taken to determine its average value: the nature of many agricultural inputs is that the probability of their success is non-linear. For example, irrigation might push up yields at the bottom of the distribution more so than at the top: a linear effect would cause the same amount of addition growth per unit of input. Similarly, the optimal amount of fertilizer application is an extraordinarily difficult non-linear function, which must take into account the fact that pre-existing nutrient levels in the ground are both unknown and uneven across a field. This makes it extremely difficult to quantify optimal inputs (Roberts, 5-7).

The next level of risk makes these choices even more difficult. This level takes into account that agricultural markets are notoriously imperfect: that is, everyone cannot be insured for all of the risks they face due to the presence of asymmetric information. With asymmetric information, the problem is that some individuals are better informed than others as to the risks faced for a certain project. There are two main factors that contribute to an environment of this kind: adverse selection and moral hazard. The former implies that it is a market where no outside party can be on equal terms with the farmer in terms of the knowledge of the true risks that he faces. The latter means that the farmer's

decisions are not explicitly observable: while both an outside party and the farmer know the probability distribution of possible outcomes, the physical and mental effort exerted by the farmer cannot be determined by an outside party as it is impossible to observe his actions in person.

Thus, an outside principal who has the capabilities to insure the farmer against risks can neither distinguish completely between higher and lower risk farms, nor tell if the farmer is satisfying the contract by providing the optimum amount of inputs. Instead, that principal must use a menu of different premium-deductible combinations to differentiate high-risk types from low risk types. Similarly, the principal and agent must write a second-best incentive scheme based on some observable and verifiable outcomes, such as yields, prices, and profits. However, as discussed in the dealings of the first layer of risk, these outcomes are not only solely based on effort, but also luck that the "good" events, such as optimal rainfall, occurred. As a result, insurers are often hesitant to insure farms, and even if farms are insured, they are not covered for all possible risks.

Thus, when farmers make decisions to maximize profits, they must take into account their individual aversion to risk as, because they cannot perfectly share it, they will almost certainly face direct consequences as a result of a riskier decision. The level of aversion to risk can be measured to some extent by the diminishing marginal utility of wealth of that individual: the more risk averse one is, the more rapidly one's marginal utility declines with one's level of consumption or wealth. Thus, a farmer will make his decisions by trying to maximize a given utility of profits: the higher his tolerance for risk, the more he will value high, but very variable, profits. The lower his tolerance for risk, the more he will be satisfied with steadier, but smaller profits. The equation for this

expression can be writing V=max E[u(∏(x,s)], where u is the utility function. Because the utility function will be a nonlinear function of the profits, random factors will influence optimal decisions even when they enter into the profit function linearly, which will make it even more difficult to determine the proper inputs x (Roberts, 13-16).

The farmer's decisions become even more difficult when, once his optimal level of risk is determined, he must decide how to best fulfill the terms of the loans which provide the funds to allow him to take the risk. This "third level" is due clearly to moral hazard: the farmer will not explicitly be able to think in terms of profits: instead, he will have to think of maximizing his return to the "incentive contract". Again, in an incentive contract the individual faces higher risk than he would in a contract issued under perfect information as he will be pressed to provide an output that is not solely a result of what he can control.

There is again the tension here of maximizing returns subject to a given risk aversion, but this becomes an extraordinarily difficult function, which includes the utility maximization of the farmer and the credit lender. Specifically, the farmer wants to maximize his return, which is a function of the total profits, w(∏), and he will not enter into the agreement unless he believes that the contract will give him a least a certain utility level: $E[u(w(\prod(x,s)))] \geq \bar{u}$. The lender wants to maximize his return as well, which can be thought of as the difference between the total profits and the farmer's return: V = max E[∏(x,s)- w(∏(x,s))] in terms of both x and w and subject to the above farmer's belief about the utility of the agreement mentioned above.

The exact nature of the contract curve in this situation becomes very difficult to determine and, as a result, the risk involved will fundamentally affect all decision in

unpredictable ways. This means that creditors will find it extremely difficult to optimize return, or even discover if the agreement is optimal at all, with similar consequences to the farmer. The worry is thus that, under these circumstances, farmers can neither avoid the risks they face nor be provided with effective insurance to protect them when the negative effects of these risks surely occur. Left on their own, farmers are at the mercy of forces they cannot control (Roberts, 19-20).

The techniques for determining optimal production inputs are oversimplified here from their real world counterparts, which include multi-period decisions, transaction costs, psychological factors, and other complications. It is clear that survival in a world such as this is far from guaranteed, especially in an industry traditionally made up of many individual proprietors who are unable to absorb their risks like a large corporation might. Although it is assumed that few farmers will go so far as to actually analyze their risks using the formulas outlined above, it is also assumed that they will all tend toward an optimal solution. The difficulty in solving the mathematical expression of their problems, however, indicates that there will be a similar difficulty naturally reaching a viable equilibrium.

It has been shown as well that agricultural creditors are extremely cautious: if farmers can get credit at all, the theory states, they are subjected to extremely high interest rates (Lewis 332). Many farms that could be successful will not be because they will not be able to get the credit they need. Even farms which do everything "right", cannot control all risks, and could be subject to an "unlucky" event which would require the farm to file for bankruptcy.

Determining the optimal inputs is not the only problem that is believed to hurt farmer's chances at surviving in competitive markets: farmers are also believed to have a very difficult time because they are subject to extreme slowness in supply response. Conventional wisdom since the 1930's was that crop supply and demand were not sufficiently price responsive to preclude relatively long periods of depressed prices and incomes. Due to the high number of individual proprietors in farming, each farmer will be unwilling alter his output, which is both small in relation to the total output and not very diversified, when prices are lower. As mentioned above, consumer demand for many farm products is extremely inelastic: the same amount of food is required for survival regardless of its prices. Thus, demand too was not a sufficient force to equalize price fluctuations. The crop market will self correct and prices will recover from a price drop only if crop output declines significantly or crop use increases substantially (Ray, 5).

Lastly, in today's world, the new global economy has left farmers subjected to the forces of changing exchange rates, slow downs in the economies of countries that are key markets, and the fluctuating amount of output that other producers choose to produce in the world market. Agriculture is also often the victim of political strife such as grain embargos. This results in even further instability in commodity prices: these factors will lead again to repeated intense industry disequilibrium and farmers will never be able adjust output fast enough to stay afloat (Dudley 37).

These arguments receive special recognition by virtue of their being from a sector deemed important and necessary for the population as a whole: while investors in the stock market must accept that they might lose everything due to the intense risks inherent

in that activity, it is not acceptable that the agricultural sector to do the same. To experience losses so that at some times there will not be enough food available is simply not an option, and if agricultural markets are such that they will always be plagued by these uncertainties, then there is no other option than government support. In fact, government policies are even more desirable in that they can be used to ensure stable levels of overproduction so that Americans will have the security that they will not run out of food regardless of the weather or the worst wartime emergency (Tweeton 137).

If these arguments are heeded, it becomes clear that some type of non-market support must be offered if the agricultural industry is to survive.

In addition to these worries, the other very popular motive that drives support for farm subsidy policies is the belief that they are necessary for the continued existence of the family farm. American ideals value the existence of the family farm: it is thought to be a small enterprise characterized by hard work, family unity, and independence. Technology, however, has hampered the ability for these farms to be competitive in the industry. New capital assets available have made it possible to farm large quantities of land efficiently, and in doing so farmers pay lower costs per individual commodity produced due to increasing returns to scale. As a result, those with access to large amounts of land and funding for expensive capital will be more competitive. Those farmers with little financial capital to afford expanding their farms or the technological assets needed to farm that new land will not be able to compete (Dudley 37). Instead, the void will be filled by large farms, which also have the financial assets to slowly liquidate farms around them in an effort to benefit further from increasing returns to scale.

Major Support Offered

A variety of support measures have been enacted in the United States thus far to provide protection against the problems outlined above. The problems of price and yield risk were shown to make determining optimal output and effectively adjusting supply extraordinarily difficult: as a result the objectives of various government support programs are to greatly diminish the effects of these two risks on producers. A brief general description of those most relevant to the United States and the changes to the most recent farm bills will be discussed here: price support mechanisms, payment for land set asides, input subsidies, and insurance subsidies.

Price support mechanisms, or deficiency payments, are meant to stabilize volatile commodity prices. If the price of a particular agricultural item falls below some predetermined fixed price, then the difference between the fixed price and the market price is paid as a direct subsidy to the producers of the product. This guarantees producers a minimum profit, and protects farmers from dramatic swings in world prices. In the United States, these are targeted to only certain crops, called program crops. In addition, the Marketing Loan Program allowed farmers to take out loans at the posted loan rate for each individual commodity produced, with the option to repay these loans by forfeiting the crops to the government if market price at the time of selling was lower than the original loan rate. This provides a price floor for producers.

Payment for land set asides is essentially payment made for farmland that is set aside from production. The government contracts with farmers to take a certain amount of land out of production, and then pays the farmers a set amount for each acre out of production. This gives the government more control over the amount a certain commodity that is produced so that it can in theory protect farmers from over production

of a good, which would drive the market price down. These programs are linked to price support programs as well, which gives government further control over exactly what crop is produced.

There are also input subsidies on the value added to production, which are usually percentage subsidies on value added through land, capital, and labor. In the U.S., this works as an export enhancement scheme to help finance U.S. agricultural sales abroad, as the costs of producing are quite a bit lower when these subsidies are used so that U.S. commodities can better compete in world markets (Feltenstein, 200). In addition, many new inputs are subsidized to encourage farmers to try new efficiency boosting products. The newness of these products implies that all problems associated with their usage cannot be known for certain, and there is a resulting greater risk in choosing to use them: making it cheaper to use these inputs encourages farmers to take these risks when they might otherwise refrain. Input subsidies are also said to help the small farmer compete by decreasing his input cost so that they can better compete with the large farms economies of scale. However, these subsidies, like all subsidies listed here, are offered to farms of all sizes.

The government also offers subsidies on insurance to protect against yield risk. It is meant to reduce the chances that some unforeseen, "unlucky" event, such as weather, will cause an otherwise profitable farmer to enter times of unfixable financial hardship. The benefits of this insurance are much higher than what might be offered in market conditions: by 1994, the premiums of participating farmers were completely subsidized for catastrophic risk protection. This level included coverage of up to 50 percent of average yield at 60 percent of the expected price. In addition, if further coverage was

desired, the farmer could pay 25 percent more in premiums to be covered for at least 65 percent of average yield at 100 percent of expected price (Roberts, 33). Like the input subsidies described above, subsidized yield risk encourages farmers to make riskier decisions than they might otherwise, this time because they face the consequences of their risky acts to a much smaller degree due to payment of insurance premiums in times of need.

These programs appear to be very effective at mitigating risk. According to a recent study by the Organization for Economic Co-operative and Development, market price support reduced risk by 60 percent in the U.S. The study, which linked revenue variability to risk, found that subsidy programs in general reduced variability by 40 percent compared with the situation in which such programs did not exist (Agricultural 2003, 35-36)

Arguments against support

Although these programs are very effective in managing risks and prolonged low prices, there have been several severe consequences of their enactment. The arguments against the particular government intervention programs described above concern both the tremendous cost and the market distorting effects of such actions.

Subsidies of any industry cause shocks to the market supply or demand curves. Price support subsidies in particular remove the signs the market gives producers during changing periods of demand. Thus, when the world price falls below the price support target price, supply will exceed demand. In addition, like many other countries, in the United States, price supports are only given for certain crops. These are called program crops, and are wheat, corn, grain sorghum, barley, oats, rice, and upland cotton. In 1996,

soybeans were added as well. Thus, instead of relying on the market to decide what kind and how much of a commodity the farmer wants to produce, he will compare the world prices of an unsupported crop to the supported prices of a program crop and determine from which he could earn a higher profit.

When land set asides, which frequently apply to when the farmer is using a program crop, come into this equation, his new task is the maximization of profit given the prices of the supported and unsupported commodities, together with the amount he would earn leaving a certain portion of his land idle (Evolution 1-2). Depending on the amount of land the farmer is allowed set aside, the compensation given for the set-aside, the subsidized price of the program crop, and the world price for the other unsubsidized commodity, this can result in severe output, and thus price, distortions. Because of the benefits received, there will be a tendency for farmers to focus only on program crops. Unprofitable industries, it is argued, will continue to grow, while diversification into other crops or livestock will occur slowly or not at all, as there is no incentive for farmers to make the switch (Myers, 111–113).

Input subsidies shift the supply curve outwards, increasing the quantity that suppliers are willing to produce, and in the process decreasing the price of the commodity. U.S. producers, due to the large amount they are able to process, are able affect the world price of many goods when they vary output. United States agriculture currently produces 20 percent more than the country can consume: thus, the extra commodity must be exported. This flood of extra commodity into the world market, again due to inelastic demand, lowers world prices dramatically. Today, U.S. corn

exports are 20 percent below the cost of production, and wheat is 46 percent below (Tweeton, 137).

This was exactly criticism of the United States, as well as other wealthier, developed countries, by less developed countries around the world, and removing the policies that cause these distortions is one of the main objectives of the WTO Doha Agenda. Those against agricultural subsidies argue that the tremendous amount that is produced and exported to other countries lowers the world price so much that other, emerging countries, cannot compete. The use such subsidies cannot be said to only have a domestic effect: these policies make other countries, which are unable to afford similar support programs, unable to survive (Fifth).

It is also argued that in addition to altering the output of commodities so that they are both not produced according to market signals and in some cases produced in tremendous excess, the expenses of buying and storing the extra output misallocate the nation's resources to a great extent. Excessive output and resources committed to farming cost the nation $930 million based on the average, 3.4 percent, estimate of uneconomic production excess from 1998 to 2000. Other market distortions add to this deadweight loss as well: there was a $600 million national income loss from peanut, tobacco, sugar, and dairy programs whose world prices were way below support prices. The administration and lobbying resources used cost almost $2 billion dollars, and those against these domestic support programs argue that these funds could have been better used elsewhere. Land values, as well, are currently estimated to be inflated over 25 percent due to the commodity programs: the higher amount of money that can be made

by producing certain crops or simply just idling the land causes land prices to rise tremendously (Tweeton 134).

Another issue to consider is the deadweight loss incurred through such procedures. Federal income taxes used to support government programs lose on average at least $16 of real national income (deadweight loss) per $100 collected. Thus, government payments to farmers averaging $18.6 billion per year from 1998 to 2000 lost $3 billion of national income annually because the public made different savings, investment, and labor used decisions than it would have in the absence of taxes that finance farm programs (Tweeton 124).

Finally, the proportion of funds in these programs allocated to supporting small family farms are in fact very small. These payments are distributed based on both output and land use: the more of both that a farm can attain or produce, the higher dollar amount in subsidies that is received by the farmer. There are two types of small family farms which actually rely on farm profits as their major source of income: limited resource farmers and low-sales family farms. Disadvantaged, limited resource households accounted for 5.8 percent of farm households and 0.6 percent of farm receipts but for only 0.9 percent of farm program payments in 1998. Payments to these households were on average $620, small in comparison to the average payment of $4,291, and even smaller when compared the average received by very large farms, $23,379. (Tweeton 136). Low-sales family farms received slightly higher payments, but still accounted for only a little over 10 percent of total subsidy payments: the rest was received either by large farmers or those small "hobby" farmers whose major income comes from off-farm sources (Diverse, 5). Although the payments received by these farms do help in their

survival, it can be argued that these payments in reality do not really give a "leg up" to disadvantaged farmers as the same payments are being received by their larger competitors.

The arguments thus far have dealt with the extreme expense of these programs, the market distortion they cause, and their failure if their main objective is to help small family farms. The tremendous costs of these programs together with the way they manipulate the allocation of resources might make one wonder if they do provide the benefits they promise.

1996 Policies

The 1996 FAIR Act was an attempt to remedy some of these problems while still allowing its survival at socially acceptable levels. While the traditional government programs did prove very effective at mitigating risk, there are many other risk management options offered by the market, which are both much less expensive and output altering, which might be able to serve the same function. Traditionally, however, it was believed that although they somewhat insure risks, they were not effective enough to be used on their own due to the nature of the farming sector.

In 1996, however, it was believed that the United States farm sector had changed, and although it still needed some yield risk support in the form of subsidized yield insurance, it could now manage some of its price risk in ways other than high government price subsidies. This was thought to be true due to the changing nature of farming as the twentieth century has progressed. It is not only that there are fewer farms, and that agriculture is a much smaller part of the rural economy. It is also that agribusiness now supplied many of the inputs that farmers used to provide themselves, and farmers on

average were much more educated and thus thought to be capable of undertaking sophisticated risk management devices. It was thus forecasted that farmers would more readily be able to change production with changes in prices and profitability (Ray, 6).

The price support system that had typically been used in the past was removed in favor of a less distorting policy which would act as a buffer while farmers adapted to handling the new price risks. The new program operated on the theory of decoupling: decoupled payments are not based on current prices or output but instead are direct payments based on clearly defined historical measures. Thus, in theory, decoupling does nothing to distort current or future production decisions. (Baffes, 4-5). Producers are provided extra support to help them in case of price drops and to help with operating costs, but are not given funds in a counter cyclical manner. Although due to the reality of imperfect markets, there is probably some distortion, the magnitude is generally agreed to be much less severe than when price supports are used (Roberts, 32).

Thus, Production Flexibility Payments, made to producers in proportion to what they had received in 1990-1995 period or what they would have received if they had participated in the programs at that time, replaced the deficiency payments. These payments were still based on enrolled contract area, but not related to current plantings. Producers received the same amount of these payments regardless of the prices and market conditions, and these payments could in part be used to produce crops other than the main program ones. They were set to decrease each year following the program's inception as a way to provide farmers with some sort of support while they adjusted to managing without prior deficiency payments. The Marketing Loan Assistance program,

however, remained in place, although a limit was set on how high a level the loan rate could reach (Agricultural 1997, 78-82).

In addition, supply management programs for program crops, with the exception of long term programs meant to conserve national resources, were eliminated. With commodity prices high, and the removal of deficiency payments exposing farmers more directly to the world market conditions, the major belief was that farmers should be able to adjust both the amount and type of commodity supplied to maximize profits (Ray, 5).

As mentioned above, the enactment of these two policies required a leap of faith by the government policy makers: it had to be believed that farmers could now find alternate ways to handle the short term price risk other than price support mechanisms and would be able to be sufficiently supply responsive in the long run to adjust output due to market fluctuations.

Farmers would not be completely on their own to face the mishaps of the outside world. Insurance against yield risk remained: in this bill farmers were eligible for government disaster aid without having to purchase disaster insurance. They were, however, required to waive eligibility for government emergency crop loss assistance if they did not acquire crop loss insurance.

The main belief at the outset of these programs was that a strong market for U.S. commodities, and thus high commodity prices, would remain in the future due to a continually expanding export market. It was thought that the increase in per capita incomes worldwide, especially in China and other Asian countries, along with the advent of freer international trade from regional and global agreements, would lead agriculture into an export-driven path of sustainable prosperity (Ray, 2).

If this failed to occur, the fallback was again that agriculture, as it had changed to become a part of the late twentieth century economy, would be able to respond accordingly. Even facing the difficulties of quantifying and insuring agricultural risks discussed above, the farmers of today, both large and small, would be able to use effective modern risk managing techniques, such as futures markets and production contracts, to mitigate any problems that might appear. The 1996 farm legislations provided a real-time public policy experiment which said, "Without planting restrictions, high price supports and other government program interventions, grain producers and grain users would be able to respond to price signals sufficiently to overcome market disturbances and inventory imbalances" (Ray, 6).

What went wrong

There were several incorrect assumptions and subsequent policies which greatly altered the intended effects of the 1996 bill. In hindsight, the most obvious was the belief that commodity prices would remain high into the future due to sustainable exporting levels.

It is indeed important to note that the 1996 FAIR Act was written and enacted in an environment of very high commodity prices. This was not a time of economic hardship for most farmers, but a time when the profits the market offered made it unnecessary for many of them to use the deficiency payment system. The new policies of the 1996 Farm Bill did involve some fundamental changes in the beliefs on how farmers deal with risks, but with the caveat that farm commodity prices would from then on remain quite high.

Looking back at the USDA projections made in February 1996 for corn exports during the period, forecasted exports were 22 percent greater than actual exports. The 1996 projections also predicted a 25 percent higher level of exports in 2000-2005 than a similar set of projections conducted in February 2000. Similarly, 1996 price predictions were well above real prices: projections were 50 cents a bushel higher for corn, $2 higher for soybeans, and $1 higher for wheat compared to the 2000 USDA year 2000-2005 projections. Prices on commodities in fact dropped as much as 40 percent from their 1996-97 levels (Ray, 2).

Something changed, then, to alter these projections so drastically. As mentioned above, it was the growth of per capita income in Asian countries, specifically East Asia and China, which was counted on for the expansion of U.S. exports. Overall, these areas accounted for 40 percent of agricultural exports, or $23 billion annually. During 1991-97, Asia accounted for 45 percent of U.S. export growth. (Shumacher). The East Asian financial crisis changed all of this.

Following the crisis of 1998, the countries involved, and those surrounding those countries, all saw their currencies depreciate relative to the dollar. In the cases of Indonesia and Malaysia, their currencies could then buy about one-third the dollars they did a year ago. This means U.S. products now cost them three times as much as a year before, as the dollar price remained relatively stable. Even a sharp fall in commodity prices could not effectively help cheapen prices in these countries: grains, whose dollar prices fell substantially in 1998, cost roughly twice as much in these countries as they did in 1997. Moreover, the declines in real income meant reductions in demand for high

income goods, a category into which many U.S. high-valued meats and other food products fell.

U.S. exports ended up falling 10 percent during this time frame. Although it is not clear if this decline was entirely due to the economic crisis, it cannot be said that it did not have a drastic effect upon the industry. In fact, as farm commodities are extremely inelastic, there is general low responsiveness of U.S. export sales to lower dollar prices for exported commodities: again people tend to need only a certain amount of food, and small changes in commodity prices are not going to significantly alter that. Thus, even a small decrease in world demand causes a disproportionate decline in U.S. farm prices. Although it is not possible to be precise about the effect, a 5 percent reduction in demand due to the Asia crisis could well cause prices received by U.S. farmers to fall by 10 or even 15 percent. Effects that are so large occur not only because of the export market itself, but also because of similar rigidities in the U.S. domestic market. The United States domestic market could absorb the commodities not taken by Asian importers, but this would again only happen if prices are lowered to a great degree: it takes more than a 5 percent price decline to get the market cleared for a 5 percent increase in domestic consumption of farm products (Gardner). Again, the extreme inelasticity of demand for agricultural commodities causes extreme price variations which make it difficult to remedy profit losses in periods of oversupply.

Looking back at the history of U.S. agriculture, it is not surprising that an event of this nature occurred. In the last century and a half, there have only been three periods of export-driven agricultural success, each followed by a subsequent drop-off in prices: World War I, World War II, and in the 1970's. Each period was marked by the inability

in other countries to produce their typical agricultural output due to war, weather, or financial hardship. Each period was also characterized by U.S. government suggestion to plant, "fence row to fence row" (Dudley, 37). The demand for U.S. exports subsequently weakened considerably in each time frame, due either to economic reconstruction and rehabilitation of foreign nations or political embargoes on U.S. agricultural products. This left the United States farming community to deal with the consequences of immense oversupply.

Even ignoring the intense fluctuations of the world market, it must be noted that the U.S. is not the only county desiring to supply the world with food. Movements into the area of free trade have given agribusiness to opportunity to sell their products to other countries, thus allowing investment in those countries' agricultural industries and improving their productivity. For example, following the liberalization of the agricultural sector in Brazil, many new investors were foreign: investing heavily in food processing, transport and infrastructure, businesses like Cargill, Archer Daniels Midland, and Bunge, have provided much of the funds. These commodity giants, mostly interested in soybeans, have processing plants located in Brazil, and expect, and have received, enormous returns. Brazil surpassed the United States in 2002 to become the largest exporter of soybeans. It is noteworthy to consider that Brazil has been able to do this without the tremendous level of subsidies U.S. soybean farmers have access to (Margolis). It can also be assumed that, similar to the United States, many countries do not desire to have the weakness of not having the capability to supply their own food, and thus may not be willing to allow the U.S. to simply import food to them forever (Ray 12).

Thus, problems of the new global economy discussed above are very real. Changes in government policies, exchange rates, world weather, and foreign economic conditions will always be unpredictable threats. It is naïve, then, to think that exports are the path to stability in agricultural commodity prices: a call for expansion of agricultural supply during these times must be met with great caution and never thought of as permanent in nature. Any move away from current agricultural subsidies will not be sustained by solely relying on continued expansion of exports.

Exports, then, failed to keep commodities at the high levels seen at the inception of the bill, leaving the farmers to deal with the levels of risk they face without the aid of past government price support. The hypothesis of the 1996 FAIR act again was that this was possible due to the changing structure of the agricultural sector: more educated farmers from on average larger farms would be able to effectively adjust their supply.

When looking at this from an output management point of view, this does not seem to be the case. For most program crops, yield can be somewhat influenced by altering inputs, but the greatest input to change yields is weather. Thus, farmers to these crops can really only effectively alter the amount they choose to supply by controlling the acreage amount of the commodities they harvest. This ability was given to them through Production Flexibility Contracts and the removal of short-term supply management programs. Despite these new programs, the acreage amounts for soybeans, wheat, corn and cotton remained virtually constant during this time period. This was despite a 22 percent average price drop, which included the Market Loss Assistance payments and Marketing Loan Assistance rates received by the farmers. The fact that the farmers faced

this tremendous price change and still did not adjust their supply in the longer term indicates a difficulty in altering supply in the face of changing prices. (Ray 7).

There are, however, several important caveats to this analysis which have very important effects on its validity. The 1996 FAIR Act ideally operated under the principles of decoupling, but in reality it did not completely follow such policies. Firstly, the Marketing Loan Assistance program remained in place. As described above, this program operates as a price floor: thus, when prices become lower than the loan rate this acts exactly like a deficiency payment and, assuming supply is not completely inelastic, would distort output in the same way price supports do. The Market Loss Assistance payments violated the principles of decoupling in a similar way. Although distributed according to the same base area restrictions as the Production Flexibility Payments, and thus not given in proportion to current output, the payments were issued counter-cyclically in the sense that they were in response to low current prices (Baffes, 8). This increased the farmer's net profit, which might affect his decisions for production both due to increased funding for next year's planting and the softening of price changing effects on his financial statement. The United States in fact placed these payments in the "amber box", a category for policies that are considered trade distorting and which alter producer's output decisions (Nelson, 4).

As mentioned above, even with these programs, prices on major commodities decreased by 22 percent. However, without these programs' help, farmers would have had to face market prices that were down by an average of 40 percent from their 1997 level (Ray, 7). This is quite a difference, and could very well be enough to fundamentally alter production decisions.

It might still be strange to think that production would not change at all in the face of a 22 percent price drop. It must be noted, however, that this price drop fails to account for all other added benefits accrued to farmers through other concurrent subsidy programs. Both input subsidies and highly subsidized risk insurance, among other programs, remained in effect during the period of the bill's enactment.

As discussed in a prior section, input subsidies on irrigation, grazing livestock, state credit programs, and new agricultural products make inputs cheaper. This makes it profitable to increase output to higher levels than when the sector is left to follow market conditions alone.

The highly subsidized nature of risk insurance increases producer returns as well. Insurance benefits are measured as the amount of insurance indemnities paid to producers minus the producer's share of the insurance premium. As government yield insurance is so subsidized, producers on average end up receiving quite a bit more compensation than they put into the program: crop net insurance payments amounted to 747 million in 1998 (Nelson, 5).

These programs make producing commodities cheaper and less risky and thus could fundamentally alter output decisions. The exact effects of these two programs are not quantified here. Because of this, their monetary effects cannot be specifically analyzed, but the possibility of their effect on output decisions cannot be ignored.

These factors, as well as the deficiency payments that were offered in this period, and the environmental land set-asides, which affect long-term supply choices, all affected the supply choices of a very heterogeneous array of farmers. In addition, the voluntary nature of the farm subsidy program itself must be considered a factor: around 40 percent

of America's farmers participate in farm subsidy programs. The character traits of those that decide participate may well be a factor in the supply response paradox.

The simple price comparison approach described above is not detailed enough to describe the true environment the farmer in which the farmer makes his decision (McDonald 1-2). Indeed, despite the sharp fall in commodity prices, on average both large and very large family farms managed to earn a profit in 1998. The combination of market conditions and government payments to these farms left them able to bring in profits in this time frame, despite a sharp fall in prices and an inelastic supply (Diverse, 4). All this suggests that there might be other forces at work here.

The inability of farmers in this period to effectively adjust their supply in the long term to match prices can therefore not be determined by the evidence analyzed thus far: because the government did not completely follow the policies of decoupled payments and operated them simultaneously with other output altering subsidy programs, it cannot be determined if American farmers can handle risk on their own using alternative risk mitigating techniques. Farmers were in fact never forced to operate their farms in such an environment, but instead could continue to a large degree to fall back on additional government payments and other programs.

In add to this, the 1996 FAIR Act offered no solution to the protection of small farms: even though payments were decoupled, they were still based on prior production and thus in proportion to output and farm size. This means the small farms continued to receive a very small fraction of total support while larger farms received quite a bit, giving them no advantage in the production process (Baffes, 14).

Looking back at the aftermath of the 1996 Farm Bill, it is not difficult to see that this experiment was not a success, but it cannot be projected that any such endeavor to end subsidies will be doomed to similar failure.

To solve

This is not to claim that solving the problems involved in liberalizing agriculture will be an easy task. Producers in the sector have become very accustomed to receiving government aid, and the risks which they face are indeed not easily tackled. However, the results of the 1996 FAIR Act have far from shown this endeavor to be impossible. If the desire to move away from policies of high domestic support is genuine, then the mistakes of this bill must be both admitted and used as guidelines for the future.

It is apparent that expanding exports cannot be relied upon to stabilize commodity prices as their instability is a tremendous source of the price risk that farmers face. The uncertainty of the global market is one of the reasons that managing risk in the agricultural sector is so complex, and so relying on that very thing makes no logical sense. There is no magic solution then, which will eliminate price change risk: it will always be a factor in the decisions of agricultural producers. If removal of current subsidy programs is to succeed, alternate risk management programs need to be focused on, developed, and actually applied. This is the key to providing the farmer with the ability to deal with these inevitable price changes.

These programs can include, but are not limited to, enterprise diversification, vertical integration, marketing and production contracts, futures options, maintaining financial reserves, and off farm employment: though each has its limits, these strategies allow for the management of risk both through maintaining personal reserves and pooling losses.

In some industries, production contracts, in which a buyer agrees to purchase a certain product in the future, provided it is grown to his exact specifications using inputs he supplies, have been empirically shown to decrease risk by more than 97 percent compared to an independent grower situation (Harwood, 27). The exact theories behind these risk management policies and the empirical results resulting from their combined use are outside the scope of this report, but can be found in many agricultural risk management guides.

Due to the heterogeneous nature of farmers in the agricultural sector, different combinations of these programs may work better for each producer. Much more research needs to be undertaken to discover effective combinations and to educate farmers on how to utilize them. Most of these policies are actually supplied by the market, and with sufficient government regulation and further research into their uses, may provide effective risk management techniques.

High sales small family farms and large family farms, who have sales of almost $250 thousand and slightly over $250 thousand, respectively, received 48 percent of government payments in 1998. These farms received such a proportion of government aid as they tend to produce program crops, which qualify to receive Marketing Loan Assistance and other government subsidies (Diverse, 4). It makes sense then, that this group has been to most vocal about the necessity of high domestic support: it is they that will be most affected by its removal. If support of this kind is removed, it is these farms in particular which will have to utilize these alternate risk handling strategies to the fullest.

Some incentive, however, needs to be given to farms to utilize these resources to a greater extent: this will never occur if farmers believe that high levels of domestic support will be given to them in the end. Although the 1996 Farm Bill committed the U.S. government to "weaning" farmer off of traditional support by giving annually decreasing, decoupled Production Flexibility Payments, when prices dropped farmers were greatly shielded from profit losses due to Marketing Loan Assistance and subsequent Market Loss Assistance payments. The return to deficiency support in the 2002 Farm Bill furthers weakened any incentive to try other risk options. There was no incentive, then, to sacrifice the funds necessary to participate in alternate risk management strategies as the government failed to follow the principles of decoupled payments.

Due to the extreme political influence of the farming community, it will always be very hard politically to maintain this stance, and because of this the government needs to be held accountable to a third party: the WTO. If farmers feel that the policies will remain enforced, and that they will personally have to account for profit losses, then they may be much more willing to participate in these alternate programs.

Similarly, if the gradual removal of current subsidies is desired so that farmers may adjust slowly to agricultural liberalization, the interaction between the removed and remaining subsidies must be considered: the ideas behind decoupled payments may not be effective if concurrent output distorting policies such as input subsidies and even federally subsidized agricultural yield insurance remain in place. In the future, all aspects of the government farm subsidy program must be considered to avoid ineffectiveness of the intended policy. If this is done, and farmers actually do have to deal with the

increased risks of an economy that does not include output altering domestic support, then it is possible that the nature of the supply curve for agricultural commodities can become clearer.

The last thing to consider is whether the removal of these subsidies implies that the small family farm will not survive. The difficulty in providing for these farms' survival without government protection lies in the fact that many of the risk management techniques offered, such as production contracts, alter the independence that many people consider necessary for the family farm to remain classified as such. However, as mentioned before, family farms classified as small and disadvantaged currently receive an extraordinarily small percentage of the subsidy funds.

Although there are other types of "small" family farms classified by the U.S. Department of Agriculture, these are the only type which fall into the definition of small described in the first section. Small family farms with large sales, which are reported above to receive a large amount of current subsidy payments, have outputs that effectively make them very close to large family sized farms: many are thus unlikely to fit the qualifications that Americans find appealing in a family farmer. The other small family farms fall under the categories of retirement or lifestyle farming: the majority of their income comes from non-farm sources (Tweeton 138). As a result, they naturally have a source of alternate off-farm income to protect them from farm income risk.

If the existence limited-resource or low sales family farms is desired in the future, their costs are such that they will need continued support to compete with the economies-of-scale that the larger farms enjoy: even though they receive much smaller payments than the larger farmers, these payments still make up a respectable percentage of their

income (Diverse 4). However, support can continue to be offered to them in a much cheaper and less distorting way: direct, decoupled payments should be given out inversely to farm size. This means that farms might be given a genuine way to deal with the increasing returns to scale problem, because the same funds will not be given to larger farms. If it is decided that small farms with large sales are worth protecting as well, this policy would also help them as they would also get more funding than their larger competitors.

If it is discovered that larger farmers are able to manage risk on their own, so that the sole policy objective of farm subsidy programs is to preserve the existence of the small farm, this technique is much more effective than giving out payments according to farm size: giving payments out according to farm size is in effect rewarding the very quality the program would be trying to negate. Some loss of economic efficiency would still occur of course, but the degree would be much less severe.

Again due to high risk environment in which farmers exist, it is not certain that the current alternative policies for risk management will be successful. The 1996 Farm Bill, however, cannot be considered proof that these policies will always end in failure, and that the tradition subsidies are necessary, because the guiding principles of the bill were not followed according to plan. Liberalization of the agricultural sector has proved successful in Brazil, so it cannot be said that the act is always impossible. Much work, however, is ahead to effectively remedy this problem. This cannot begin to be accomplished until the mistakes from the past are reconciled and remembered when creating policies for the future.

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