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Food Security: New Market Variables and Rational Public Policy Choices

By Kendell W. Keith
With a forward by Joseph Glauber, Chief Economist, USDA

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About the Author

The author is the former president of National Grain and Feed Association, Washington D.C. He advises clients on transportation, exports and biofuels. He also works with PRX (The ProExporter Network), a firm advising companies on grain and energy markets, and is Senior Advisor to North American Export Grain Association.

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Table of Contents

Abstract

National and global food security has become a topic of great interest following recent commodity price spikes in 2008 and 2012. The downward trend of grain stocks is related to higher demand from increased incomes, higher protein diets, and biofuels, the combination of which seems to have set the stage for more frequent episodes of high volatility in food markets related to weather and other potential supply disruptions. These developments have led to considerable dialogue regarding possible need for greater government intervention in markets to provide for improved assurance of food at reasonable prices. Even in the U.S. some farm groups are calling for the re-establishment of a farmer-owned reserve for grain—a program terminated over 16 years ago. Recent research offers considerable evidence that private markets remain the best mechanism for distributing relatively scarce stocks. However, it is unrealistic to expect zero intervention by governments. The critical links between national security and food security, the strategic importance of food, and prospects for internal political unrest caused by food shortages are all significant matters of public policy in many countries. So, political leaders will continue to be drawn into some form of oversight or involvement in food supply/distribution management for a variety of reasons. The conclusions of this paper are that governments should: 1) avoid significant intervention in markets (such as trading futures or accumulating large stocks) which could distort efficient distribution of grain and food; 2) invest in the collection of stocks data and work cooperatively with other countries to make such data public for a more efficient global food distribution system; 3) participate in ongoing dialogue with other countries on methods to discourage government policy shifts that aggravate impacts of temporary shortages; and 4) if viewed as necessary, supplement private grain stocks with low levels of stocks held for strictly humanitarian and emergency needs. Government holding of large stocks discourages private stock accumulation, distorts market signals and impedes timely supply and demand responses in private markets.

Forward

By Joseph Glauber, Chief Economist, U.S. Department of Agriculture

Three spikes in cereal prices since 2006, including record nominal corn, wheat and soybean prices seen last summer due to droughts in North America and the Black Sea region, have raised concern over the level of agricultural price volatility and food security. At the international level, it is the most attention given to agricultural price volatility since the 1970s when markets were similarly in uproar due to unexpected shocks in world grain trade.

Just as in the 1970s, much discussion has been given to policy measures that could mitigate price volatility, including the establishment of global buffer stock reserves. Grain reserves were debated by G20 members at the 2011 Agricultural Ministerial in Paris and, more recently, a number of developing countries at the World Trade Organization have pushed for changes in criteria under the so-called green box which would allow reserves policies to qualify as non-trade distorting practices. Proponents argue that public stockpiling programs can moderate price volatility by buying grain when prices are low and selling when prices are high.

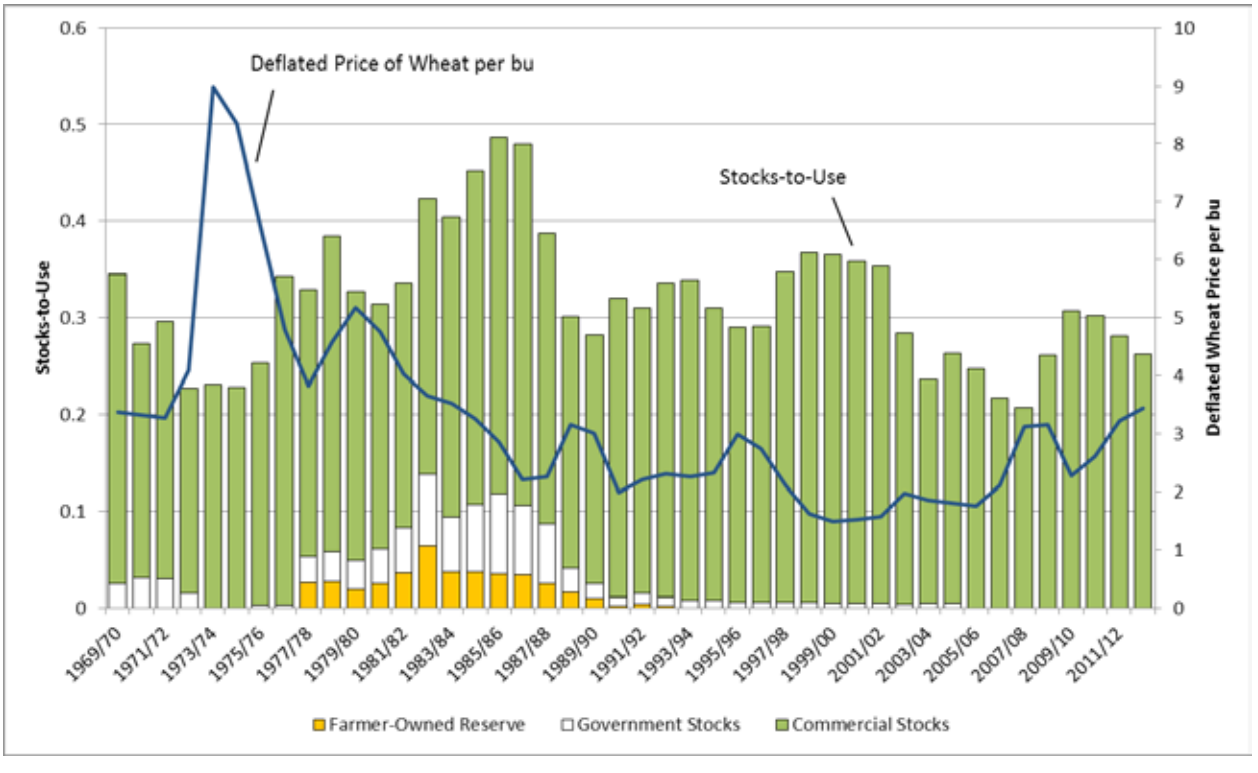
Yet while the idea of buffer stocks is simple (buy when prices are low and sell when prices are high), it is far more difficult in application. The United States has a long history of public stockpiling dating back to the late 1920s with the establishment of the Federal Farm Board (an early attempt to stabilize price through “virtual stocks”) and later, Henry Wallace’s notion of an “ever-normal granary” which became the non-recourse loan program, vestiges of which still exist in current farm legislation.

Kendell Keith’s paper gives an excellent overview of grain reserve policy in the United States. He is particularly well qualified for the topic, having spent much of his career in the storage industry as a top executive in National Grain and Feed Association. His paper discusses many of the unintended consequences of price stabilization polices, including the effects of public stocks on private stockpiling behavior. His insights provide a cautionary tale for policy makers who argue for buffer stock schemes as a panacea for addressing price volatility.

A Brief History of Food Security/Grain Stocks

Global grain and food markets were relatively stable throughout much of the 1960s as global production capacity tended to exceed global food demand at existing prices. In the early 1970s, export markets became vibrant with grain purchases by Russia and China, shrinking the global surplus and causing a spiking of prices. Privately held grain stocks, held for annual consumption needs, and pipeline stocks to bridge the gap between old and new crop, were supplemented by U.S. government involvement in markets during this period. The U.S. price support loan program, in particular, encouraged grain holding at low price levels. As global production expanded and surpassed the new major buyer-induced global demand, commercially held grain stocks were further supplemented by programs such as the U.S. farmer-owned reserve (FOR), initiated in 1978, which directly paid farmers to hold grain in excess of levels generally needed by commercial customers within a range of minimum and maximum-established prices. During this same period, the U.S. government also accumulated large stocks and generally did not sell government stocks at prices below the release prices for the farmer-owned reserve. (See Figures 1 and 2.) These two U.S. government-induced stocks—government-owned and FOR—represented roughly 20% of total global grain stocks for the 10-year period 1978–1988.

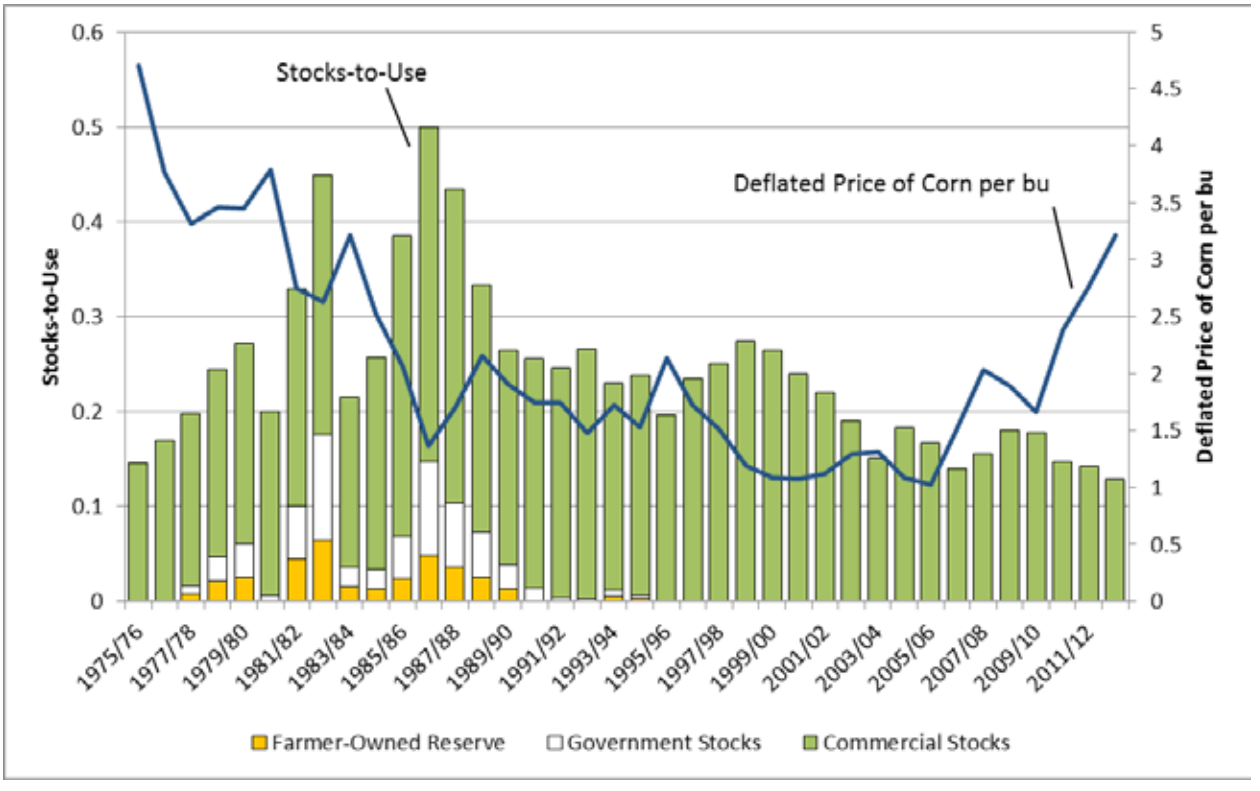
Figure 1. Global Wheat Stocks-to-Use Ratio (commercial, U.S. government and U.S. farmer-owned reserve) and Deflated Average Wheat Price Received by U.S. Farmers, 1969-2012



The U.S. FOR program was dissolved with the "Freedom to Farm" legislation enacted in 1996, but the experience with this major government-incented stock management program offers a test case that demonstrates some advantages, but mostly serious drawbacks, of heavy government involvement in grain and food markets. Some analysts argue that the large stocks from the farmer-owned reserve "saved the day" in 1983 and 1988 as the U.S. confronted serious crop shortfalls in each of those years. But it's not clear that the FOR program was solely responsible for buffering of prices. Babcock and Hart of Iowa State University (2000) argue that the U.S. private sector would have increased stocks before the 1983 and 1988 droughts in the absence of the FOR. They offer as evidence the substantial

increase in U.S. stocks-to-use ratios from 1996 to 2000, following the termination of FOR. There is additional research suggesting that much of the global stock variability in the 1980s actually was caused by U.S. government programs and such programs tended to "crowd out" normal commercial stock-carrying activities (see section below on "Increasing Grain Stocks through Public Acquisition").

Figure 2. Global Coarse Grain Stocks-to-Use Ratio (commercial, U.S. government, and farmer-owned reserve) and Deflated Average Corn Price Received by U.S. Farmers, 1975-2012.



Figures 1 and 2 show the historical pattern of stocks-to-use ratios of major grains compared with price movements. The 1990s were a relatively stable period of time, during a phase-out of government-induced stocks, and global food system-wide shocks were not felt again until 2007-08 and again in 2012. The growth in grain demand has continued to put additional pressure on the global food production and distribution system, and the policies encouraging more use of grains for biofuels usage has accelerated the growth in demand. Likewise the stability of grain supplies has been hampered by weather patterns. Following 15 years of consistent and favorable weather patterns in the U.S. corn belt, corn yields have fallen below trend in both 2011 and 2012. Questions are now being raised as to whether current policies are appropriate to deal with more crop yield variability, if in fact we are entering a period of less predictability for grain production globally.

Policy Choices to Improve Food Supply Assurance

Eliminating the Effects of Excess Speculation

Escalation in commodity market participation by speculators and investors has created a new type of investor, the commodity index fund. These funds that generally invest very large sums in typically long-only positions in futures, brought tremendous trading volumes to futures exchanges and were marketed to retail customers as an alternative to traditional stocks/bonds investments and as a hedge against monetary inflation. The market entrance and growth of these commodity index funds simultaneously with a growing tightness in market fundamentals led some market observers

to conclude that the funds were increasing market volatility and potentially distorting markets beyond price levels justified by core market fundamentals. The supposition that price spikes have been driven at times to excessive levels, thus exacerbating food costs for those least able to pay the cost, has led some to suggest that governments could consider establishing a fund to financially support a quasi-government body in taking short positions in futures markets to counteract excessive speculative bubbles. Despite the intuitive appeal of the concept that excessive money can create or has created bubbles in futures markets, a growing body of economic analysis (Aulerich, Irwin and Garcia 2012) suggests that buying pressure from index funds trading futures has not caused massive bubbles in agricultural futures prices in the past. Thus, the suggestion that a group of market experts could be assembled that could successfully identify future speculative bubbles and take short positions that would dampen speculative fervor would appear to be based upon specious reasoning. There are better and likely more cost-efficient methods to utilize government resources to accomplish improved food security.

Increasing Grain Stocks through Public Acquisition or Commercial Storage Incentives

Commercial markets create incentives through forward pricing mechanisms, such as futures, to store grain that is generally believed to be adequate to cover current period consumptive needs, plus pipeline stocks to carry over from old crop to new crop supplies. If governments do not intervene in markets, profit motivations of commercial companies and individuals also will cause some grain stocks to be carried for speculative purposes to cover unanticipated shortfalls, underestimated demand or other circumstances. This market mechanism works very efficiently to value grain storage and distribute food supplies to regions of the world where grain is most needed. Wright (2009) notes, though, that there are two reasons not to rely on private storage alone for a country's food supplies: 1) only those persons with necessary resources can afford to acquire food through the market; and 2) in severe shortages governments may be pressured by consumers to compel stocks holders to release grain for use.

Government policy can be designed in many different ways to cause additional grain stocks to be carried in excess of stocks carried for commercial purposes. Government can purchase stocks directly when prices are relatively low for release when situations warrant; government can pay private market participants a subsidy to carry additional stocks; and the government could choose to provide additional storage incentives by taking long positions in futures marketing months which would artificially enhance "carrying charges" provided by normal market incentives, to create a so-called "virtual" buffer stock.

The concept of virtual buffer stocks may be of seeming interest because it avoids the administrative and management problems of physical storage, particularly avoiding the problem of when and how to release stocks when deemed to be needed. But the concept has drawbacks in that it could distort market price signals that assist in efficient storage, utilization and cropping/supply decisions. A more serious problem with the concept is the prospect of large trading losses should the futures market change unexpectedly.

Regarding programs of physical storage, the U.S. farmer-owned reserve program (FOR) from 1978 to 1996 provides a case study of potential costs and benefits of a program that directly pays private market interests to store additional grain. In this program, farmers who held grain under a government loan program qualified to place such grain in the FOR for an annual subsidy "storage" payment of 26 cents per bushel per year. There was a substantial amount of grain stored through this program in years of relatively low prices, but the real question is how much are total grain stocks actually increased when the government pays for a large portion of stockholding? Several economic studies in the 1980s (Gardner 1981, Meyers and Ryan 1981, Just 1981, and Salathe 1984) estimated that there was a "substitution effect" which caused normal commercial stockholding to decline in response to

government-compensated storage increasing. These studies estimated a wide range for the substitution effect, ranging from 0.2 to 0.9, suggesting that a government-subsidized storage of one additional bushel would add only 0.2 to 0.9 bushels to total stocks. This substitution effect is very real and logical for two reasons. Some of the farmers who received the government storage payment would have stored the stocks anyway, as the government program had no mechanism to limit compensation to only the "marginal" storers of additional grain. Secondly, after the FOR had gone through its initial phase of accumulating bushels (which tended to support market prices), the maturation process of the program left the marketplace with an additional supply of grains isolated from the market within certain minimum and maximum price bands.

Even though such stocks were isolated from markets, market-based carrying charges were depressed, leading commercial users and sellers to reduce speculative stockholding. This kind of program to directly subsidize stocks can be expensive. If the substitution effect is 0.5 (a reduction of 0.5 bushels stored commercially for each bushel stored through government incentives, which is approximately the midpoint of the estimated range), and using the current market storage rate in the U.S. of approximately 3.5 cents per bushel per month plus interest cost of another 1.2 cents/bu/month, the cost to raise global ending stocks by 1% of total supply (27 million metric tons) would be $1.1 billion annually. Regarding large buffer stocks, Gouel (2012) concludes, "...storage policies (to address food security) have been, historically, costly and have failed to deliver the expected stabilization…." Wright (2009) concludes that stocks held to stabilize price within a band of minimum and maximum prices often become expensive quickly (leading to rapid dissolution), particularly if the lower price is set too high, causing stocks and storage costs to accumulate quickly. Wright further notes that the price ceiling discourages production and commercial storage and actually increases price volatility as market price approaches the ceiling price.

While most of this review of large buffer stock policies has been directed at individual countries' consideration of buffers, there also have been more than 40 attempts to establish international commodity agreements worldwide, often with the stated goal of stabilizing prices, and ensuring supplies. These agreements have covered commodities such as sugar, rubber, coffee, cocoa and tin. Such agreements have generally proven unsustainable, and often resulted in prices collapsing after a period of operation.

Avoiding Government Missteps in Times of Shortage

Economic theory suggests the most efficient means of dealing with a shortage is to rely on markets to restore balance and distribute food most efficiently through market pricing mechanisms. But unless countries have a plan on how to address unanticipated food shortfalls, maintaining patience among political leaders to permit price to move to levels to clear markets and allocate the scarce commodities is most challenging. The 2008 crisis in the world rice market, described by Slayton (2009), was a classic case of some Asian governments inaccurately perceiving a problem because of a lack of good information on total world supplies, then taking action to close off export markets to protect the consumers of a few nations at the expense of many. This resulted in a rapid price escalation in some countries, and a bad situation became nearly catastrophic because of decisions driven by near-term politics.

Anderson, Ivanic and Martin (2012) describe the 2008 rice market event stating, "The net effect was to reduce domestic prices in only a few developing countries while domestic prices in many other countries were increased…the actual poverty-reducing impact of insulation is much less than its apparent impact, and there are now domestic policy instruments (e.g., direct monetary transfers to the most needy) that almost certainly could reduce the impact of higher food prices on the poor more efficiently than variations in trade restrictions."

So, for countries that may have large populations of low-income people that are most vulnerable to

food price spikes, what should leaders be putting in place to manage temporary shortages? Gouel (2012) discusses the "safety nets" that many countries are putting into place. Such safety nets include features such as trading agreements with other countries to keep trade open and to share risk; social welfare programs to provide for income transfers to partially alleviate food cost impacts; and possibly, small emergency grain stock reserves to meet situations when there are short-run physical constraints to delivering food that need to be managed. In addition to implementing a "safety net," countries need to provide means to measure internal grain stocks data and grain production information and share that data with trading partners throughout the world. In times of shortage, grain stocks of wheat, coarse grains and rice are highly substitutable based upon caloric content and food value, and an accurate assessment of total global grain stocks is important for every country to avoid situations that lead to widespread panic. (See section on "Better Information on Grain Stocks is Necessary for Food Security" on page 12.)

Are Biofuels Changing Food Security Risks?

A January 9, 2013 United Nations' draft document (now receiving feedback/still under review) on "Biofuels and Food Security" by the UN's High Level Panel of Experts (HLPE), Committee on World Food Security, offers a number of concerns about how the development of biofuels may affect global food security. This draft study notes that while Brazil, U.S. and EU dominate biofuels production, more than 50 countries have now adopted biofuels policies. This draft document does put the biofuels issue into food context by stating, "If 10% of all transport fuels were to be achieved through biofuels, this would absorb 26% of all crop production." Unquestionably, the world energy market (for transport, stationary machines, electric power, heat, manufacturing) is many times larger than food-based energy and therefore under certain circumstances energy markets could conceivably dominate grain markets. But the most relevant question is whether biofuels used for certain limited transportation purposes, as they are employed today, pose a serious risk to food supplies.

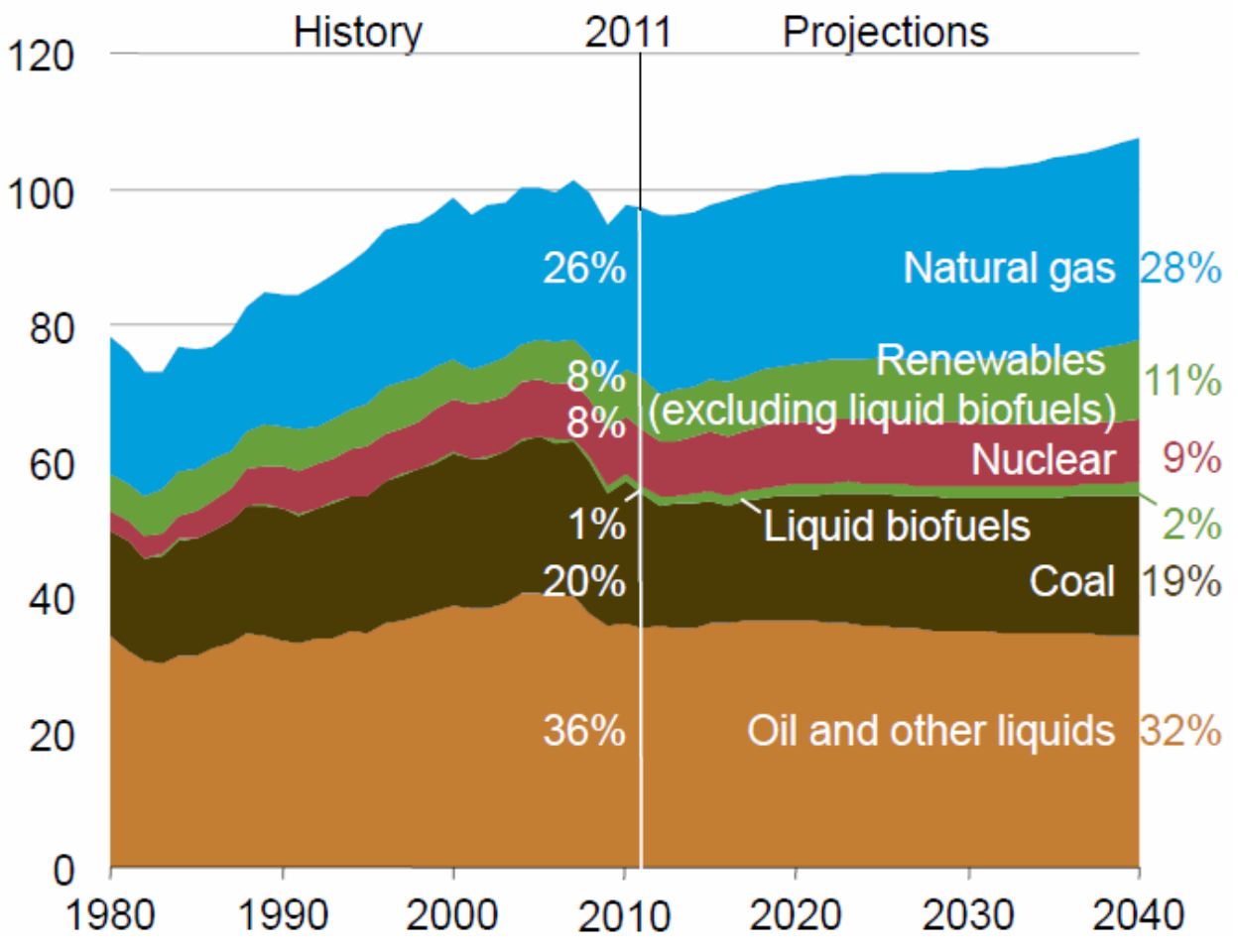
Recent developments in the U.S. that speak to this issue include:

- The U.S. Renewable Fuel Standard (RFS), approved in the Energy Independence and Security Act of 2007 (EISA), calls for a maximum of 15 billion gallons from corn-based ethanol to be used in the U.S. Other biofuel products that would add to this total, such as cellulosic fuels, have been slow to develop.
- U.S. corn ethanol is confronting a "blend wall" for utilization domestically, meaning that EPA has only approved 10% blending with general gasoline fuels. This 10% blend will only utilize about 13 billion gallons annually because general fuel usage is declining. Flex fuel vehicle usage (vehicles that can burn ethanol blends up to 85% ethanol) and 15% ethanol fuels (E-15 approved for some newer car models) must be expanded to achieve utilization even up to the 15 billion gallon level in the U.S.
- U.S. EPA and fuel market experts agree (both university professors and private market analysts) that considerable ethanol would be blended with gasoline for its oxygenate and octane improvements without current government rules. EPA clarified this in its November 2012 response to petitioners requesting a waiver of the RFS. EPA stated, "Where blending of ethanol is profitable to refiners we expect that they would continue to blend ethanol into the gasoline pool even in the absence of a renewable fuel requirement (mandate)."
- There is some evidence that "mid-level blends" of ethanol (25-30% ethanol) could be used at some point in the future to fuel high-performance engines that could improve gas mileage and have emission reduction features. While U.S. car and truck fuel efficiency (CAFÉ) standards (U.S. Department of Transportation) could drive this, it is not necessarily a threat to food security,

as a private U.S. company, Celanese, has developed a process to transform natural gas into ethanol. Thus, there are alternative large volume feedstocks for ethanol other than grains and biomass, although the net greenhouse gas reduction for such fuels is unknown.

- Crude oil and grain prices have become more highly correlated with the greater utilization of grain-based ethanol, and a rapid rise in oil prices could attract more grain-based production temporarily, but it is not likely sustainable. Absent additional mandates for biofuel usage, given current fracking technology developments to produce oil and gas, liquification of natural gas, and electric car development, there are limits as to how much grain could be attracted into energy markets after an adjustment period.
- The Energy Information Agency of the U.S. Department of Energy, in its "Early Release" of 2013 Annual Energy Outlook, forecasts that U.S. biofuel production will peak at roughly 18 billion gallons by 2022, because of resistance in the E-85 and E-15 markets, and the fact that EIA does not expect cellulosic-based fuels to reach major production volumes. This is well short of the 36 billion gallon goal established in the EISA Act of 2007. EIA's estimate suggests that liquid biofuels will not go beyond 2% of total U.S. energy usage in 2040 (see Figure 3).

Figure 3. U.S. Primary Energy Consumption by Fuel, 1980-2040, Units are quadrillion BTUs/ year.



Source: Energy Information Agency, Dept. of Energy, Annual Energy Outlook, Early Release for 2013

The rapid increase in grains converted to transportation fuel since 2007, in addition to the strong growth in food-based grain and meat demand from income growth and recent weather disruptions, has driven stocks of both wheat and coarse grains steadily downward in the last four years. Much of the adjustment in the U.S. biofuels sector has seemingly already occurred and it appears that growth of usage of grains for biofuels will taper off in the U.S. Europe is considering policy changes to reduce the amount of grains going into biofuels. While wheat stocks-to-use is currently low, the level is not as low as the mid-1970s (see Figure 1). Coarse grain stocks are also low (see Figure 2), but there are more substitutes available for the coarse grains (such as silage, hay, and grass for ruminants).

Better Information on Grain Stocks is Necessary for Food Security

Accurate information on stocks and production of food is critical to countries successfully managing food security risks. Grain that is produced does not have as much value unless it can be located, measured and reported to buyers and sellers in commercial markets. There is substantial evidence that the 2008 panic in the rice market would not have occurred, had more reliable statistics been publicly available.

There are some important research findings in recent economic literature on food security that have bearing on how information on food stocks is assembled and reported:

- Bobenrieth, Wright and Zeng (2012) report that a recent analysis of de-trended price data for global rice, corn and wheat shows that all of these grains are closely related and substitutable with correlation coefficients ranging from 0.58 to 0.79. This same study developed an index of "price for calories" using U.S. Department of Agriculture data on calories of each of these grains. Interestingly, each of the prices of major grains was more highly correlated with the calorie price series than for any of the other grains. The reported correlations for each of the grains with the calorie price were: 0.83 for wheat; 0.86 for corn; and 0.91 for rice. This analysis provides empirical support for the strong substitutability at the margin for all these grains, and suggests combining the information on these major grains when assessing critical levels of grain stocks.
- Some economists have argued that stocks data are inherently unreliable (due to reporting problems, data collection challenges, lack of information on storage behavior by households, etc.) and thus the most efficient measure of grain market situations is to rely on price alone. Bobenrieth, Wright and Zeng (2012) also found a strong correlation between the major grains and stocks-to-use ratios of each grain. However, prices of each grain were even more highly correlated with the stocks-to-use ratio of total calorie data series that combined the major grains. This study concluded that both price and stocks-to-use data can be unreliable, but "…the information in stocks-to-use ratios is sufficiently distinct from that in prices to render stocks-to-use ratios valuable additional indicators of vulnerability (in food security)." Thus, it is quite important that all countries develop reliable data collection methods for grain and food stocks information and make such estimates available to other countries to address global food security concerns.
- A USDA economist (Adjemian 2012) made an assessment of the value of information to the marketplace, and found that the average crop report from USDA affected the value of futures contracts for soybeans and corn in a range of 0.3% to 0.4%. Using this as an estimate of the economic value of crop and stocks reports to market pricing accuracy, if applied to the global value of grains in current markets (~2265 MMT production at $220 per ton = $498 billion value for all grains), accurate information from a single U.S. crop report contributes $1.5 billion in value from improved pricing accuracy. Multiple reports throughout the year would add to this value. The expense of data collection to USDA is estimated at $47 million annually in 2012 costs for the grains/oilseed sectors alone (this represents 40% of the 2012 budget of $117 million for National

Agricultural Statistics Service). Clearly there is a very strong benefit-cost ratio for accurate data on grains and commodities that represent a large portion of the world's food supply.

Conclusion

Current global stocks are relatively low by historical standards, but trends in utilization of grains for biofuels are expected to level off, permitting additional acreage to be planted and yield improvements to catch up with growing demand. The U.S. in the past had policies that carried government-owned and farmer-owned stocks to supplement the private sector, but such policies proved very expensive and mostly counterproductive. Government holding of large stocks discourages private stock accumulation, distorts market signals and impedes timely supply and demand responses in private markets. By permitting markets to freely signal the need for greater supply response, shortages that do occur will be more abbreviated and better able to efficiently distribute food. Experience with markets and economic studies suggest there are much better methods than significant buffer stocks for the world and individual countries to employ in managing food security risk.

In general, governments should: 1) avoid significant intervention in markets (such as trading futures or carrying large physical stocks); 2) invest in improved commodity statistics, in particular for stocks, and work cooperatively with other countries to make such data public for all countries to share; 3) participate in ongoing dialogue with other countries on methods to discourage government policy shifts that aggravate impacts of temporary shortages, such as embargoes or shipping restrictions; and 4) if considered necessary, supplement private grain stocks with low levels of stocks held for strictly humanitarian and emergency needs. Some governments may also find value in establishing systems of social welfare to compensate low-income consumers when relative shortfalls occur.

References

Adjemian, Michael. "Emergence and Impact of USDA's WASDE Report," Amber Waves, Economic Research Service, USDA. June 2012.

Anderson, Kym, Maros Ivanic and Will Martin. "Food Price Spikes, Price Insulation and Poverty." Paper presented at NBER Conference on "Economics of Food Price Volatility" in Seattle, WA, August 15-16, 2012.

Aulerich, Nicole, Scott Irwin, and Philip Garcia. "Bubbles, Food Prices, and Speculation: Evidence from the CFTC's Daily Large Trader Data Files." Paper presented at NBER Conference on "Economics of Food Price Volatility" in Seattle, WA, August 15-16, 2012.

Babcock, Bruce and Chad Hart. "Time for a New Farmer-Owned Reserve?" Briefing Paper 00-BP 31, Iowa State University, August 2000.

Bobenrieth, Eugenio, Brian Wright, and Di Zeng. *Stocks-to-Use Ratios as Indicators of Vulnerability to Spikes in Global Cereal Markets.* Agricultural Market Information System (AMIS) report, AMIS: IG-12/4, Global Food Market Information Group, Rome FAO Hdqtrs, October 2012.

Gardner, Bruce. *Farmer-Owned Grain Reserve Program Needs Modification to Improve Effectiveness: Consequences of USDA's Farmer-Owned Reserve Program for Grain Stocks and Prices.* CED-81-70, Vol. 2. U.S. General Acctg Office, June 1981.

Gouel, Christophe. "Food Price Volatility and Domestic Stabilization Policies in Developing Countries." Paper presented at NBER Conference on "Economics of Food Price Volatility" in Seattle, WA, August 15-16, 2012.

Just, Richard. *Farmer-Owned Grain Reserve Program Needs Modification to Improve Effectiveness: Theoretical and Empirical Consideration in Agricultural Buffer Stock Policy Under the Food and Agriculture Act of 1977.* CED-81-70, Vol. 3. U.S. Gen. Acctg. Office, June 1981.

Meyers, William and Mary Ryan. "The Farmer-Owned Reserve: How is the Experiment Working?", *American Journal of Agricultural Economics*, Vol. 63, No. 2, 1981.

Salathe, Larry, Michael Price and David Banker. "An Analysis of the Farmer-Owned Reserve Program: 1977-82." *American Journal of Agricultural Economics*. Vol. 66, No. 1, 1984.

Slayton, Tom. "Rice Crisis Forensics: How Asian Governments Carelessly Set the World Rice Market on Fire." Center for Global Development Working Paper, No. 163, March 2009.

Wright, Brian. *International Grain Reserves And Other Instruments to Address Volatility in Grain Markets,* Policy Research Working Paper 5028, The World Bank, Europe and Central Asia Region, Agricultural and Rural Development Unit, Integration Team United Nations, FAO. August 2009.

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