

Subsidizing Farmers and Biofuels in Rich Countries

An Incoherent Agenda for Food Security

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Abstract

At the beginning of the new millennium, a key development concern was the impact of agricultural policies in high-income countries on poor farmers in the rest of the world. Over the ensuing decade, the focus swung from the role of price-suppressing farm subsidies to the role biofuel policies play in driving food prices up.

While development advocates are right to criticize the trade-distorting costs and environmental risks of current biofuel policies, agricultural subsidies and trade barriers in rich countries remain in place and the distorting impact of those policies will rise again when prices decline. These traditional policies increase uncertainty and still distort what crops are grown where, so disciplines on them are still useful.

American food aid practices are also stuck in the past and reforming them could mean millions more people fed on a limited budget. The spread of biofuel support policies is also costly and inefficient, though in different ways. The precise impact of these policies on

the level of food prices is still being debated, but there is little question that they are contributing to increased price volatility.

While some upward adjustment in the level of prices was needed to encourage investment in agriculture, volatility is harmful to poor consumers and producers alike. These policies are also increasingly becoming a source of new trade disputes and the utility of the current generation of biofuels in reducing greenhouse gas emissions is questionable at best. With budgets tight and food prices high, both traditional agricultural and new biofuel support policies are increasingly under attack, and now is the time to reform them.

The paper highlights a few areas where policies seem particularly incoherent and concludes with recommendations for international agreements to support and lock in policy reforms in both the short and longer runs.

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Introduction

Over the past decade, world prices for many basic staple foods doubled and the debate over agricultural trade, development, and food security shifted just as sharply. In 2001, average agricultural prices had been falling for years and inflation-adjusted prices were at record lows. Many development advocates hoped that the newly-launched global trade negotiations would reform agricultural policies in high income countries that suppressed global prices and reduced the incomes of poor farmers in developing countries. Today, the Doha Round of trade negotiations is effectively dead and the focus is on the impact of high food prices on poor *consumers* in developing countries and the role that biofuel policies in rich countries are playing.

With commodity prices up, support for agricultural producers in high income countries is at its lowest level since the Organization for Economic Cooperation and Development (OECD) began measuring it in the mid-1980s. Though some countries adopted agricultural policy reforms, trade-distorting policies remain in place in most rich countries and the impact of those policies will rise again when prices eventually fall. These policies should still be a concern because they increase uncertainty and decrease incentives at the margin to invest in developing country agriculture (FAO 2012, p. 91). Moreover, the time to tackle them is now, when prices and incomes are relatively high.

At the moment, however, attention is elsewhere. Many experts believe that there are structural factors behind the recent increases in food prices that will keep prices at a higher plateau for at least the next decade. In this environment, traditional subsidies will remain low and biofuel policies that add to commodity demand and pit food against fuel are a more urgent concern. Biofuel support policies are also contributing to increased price volatility, could become a source of new trade disputes, and are inefficient at best in reducing greenhouse gas emissions. So the need now is for an expanded trade agenda addressing a broader range of agricultural and food security issues.

This paper first examines fluctuations in commodity prices over the past two decades and discusses how those affect the poor in developing countries, depending on whom and where they are. It then examines how price changes are affecting trends in traditional high-income country policies to support agriculture, which products still receive significant protection, and the prospects for reform in the two largest markets. The paper then turns to the recent concerns around policies supporting the production and consumption of biofuels that use food crops as feedstocks. Debate continues over the precise contribution to rising food prices of the new demand for biofuels. But biofuel support policies are creating a variety of costly distortions while making trivial progress toward the goals of energy independence and reduced greenhouse gas emissions.

The Turn-Around in Commodity Prices and Implications for the Poor

The Doha Round trade talks were launched in 2001 at a time when agricultural prices were just beginning to turn up after a prolonged period where real prices were below the 50-year trend and after nearly five years of sharply falling nominal prices (figure 1).¹ Since most poor people in developing countries live in rural areas and many are involved in agriculture, high income country policies that exacerbated low global prices became a target for development advocates.

This time, however, the recovery from a price trough was not a short-run cyclical phenomenon and real agricultural prices have been rising for a decade now, something not seen in the post-World War II era (FAO 2012, p. 99, Sumner 2009, p. 4 and figure 1). Nominal prices for agricultural commodities rose to levels that were 60 percent higher than during the volatile 1970s, dropped briefly during the global financial crisis, and then resumed their rise in late 2009. Figure 2 shows that the spikes were sharpest for cereals and fats and oils, staples that provide the bulk of calories for the poor. Prices for meat, sugar, and other foods rose less sharply, but generally followed a similar pattern. Prices have been falling in recent months, but five years after the 2008 spikes, they remain roughly double what they were in the mid-2000s. All else equal, experts expect food prices to continue easing off their recent highs for another year or so and then to resume rising, albeit more slowly, as demand growth outpaces yield growth (OECD-FAO 2013, p. 1). Stocks for some grains remain relatively low, however, and bad weather or some other shock could send prices soaring again (Baffes and Čosić 2013, pp. 16-17).

There are a number of factors behind the projections showing sustained higher price levels, most notably demand in fast-growing developing countries where higher incomes also permit more meat and dairy consumption. Another factor behind the forecast of sustained higher agricultural prices is that energy prices, which have also been rising sharply for a decade, appear to be more tightly linked to food prices. This is partly due to increased interest in investment funds that include both energy and agricultural commodities, and partly due to policy-driven demand for biofuels.²

¹ I am grateful to Peter Timmer for reminding me of the role played by China (and other countries) deciding to reduce grain reserves as prices fell, thereby exacerbating the decline. Later, however, low grain reserves contributed to sharply rising prices and increased volatility when weather shocks and increased demand due to biofuel policies led to tighter markets.

² I am focusing here on the role of agricultural policies and I will not address the role of financial markets and speculation. See OECD-FAO (2013), Baffes and Čosić (2013), and Baffes and Haniotis (2010, p. 42).

One result of the swing in prices was that international attention shifted from concern about the impact of price-suppressing agricultural support policies on agricultural *producers* in developing countries, to the impact of biofuel policies (and financial speculation) on food *consumers*. The relationship between prices, agricultural development, and food security is not a simple one and the poverty implications of eliminating high income country support for agriculture were always more complicated than the early 2000s debate on subsidies suggested (Elliott 2006, chapter 4). Higher food prices raise incomes for poor households that are or can become net food sellers, but they strain the incomes of poor households that are not. Though most of the poor in developing countries are in rural areas, most studies find that the majority of poor are net buyers of food. Thus, in the short run, the net impact of price fluctuations depends on the distribution of each type of household across and within developing countries. Over the medium to longer run, higher prices encourage investment in agricultural development, which increases supplies of food and demand for labor.

There is an extensive literature on the role of agriculture and food prices in development and poverty alleviation.³ An important recent source is a World Bank volume published in the wake of the 2007-08 food price spikes that analyzes the impact on poverty of food and other agricultural prices in a number of low-income countries where household surveys are available (Aksoy and Hoekman 2010). At both the household and national levels, the studies show that the initial impact depends on whether the household (country) is a net buyer (importer) or net seller (exporter) of agricultural commodities, and on how adaptable households are. Overall, the share of the economically active population linked to agriculture in 2010 was just under half in low and middle income countries and just under 60 percent in sub-Saharan Africa (FAO 2012, Table A1, p. 114). Yet, most studies find that there are more net buyers of food than net sellers in most developing countries. Ng and Aksoy (2010, pp. 144-47) also find that more low income countries are net food importers than exporters, though they also find that more low income countries are net exporters of agricultural commodities overall.

Considering the indirect and second-round effects of higher prices, however, they were not as negative as the numbers on net buyers and sellers suggests. *If* passed through to producers, higher world prices increase incentives to invest in productivity improvements and that increases supplies in the longer run. It also creates demand for inputs and other complementary goods, including labor. Thus, some net buyers could become net sellers and others might benefit from rising rural wages due to increased demand for related goods and services (Aksoy and Isik-Dikmelik 2010, p. 115). The household surveys also show that about half of net buyers are marginal buyers and that, overall, the buyers are better off economically than net sellers (ibid.).

³For an extensive review, see the World Bank's World Development Report for 2008 and the sources cited therein; for an analysis of how agricultural development can make growth in developing countries more pro-poor, see Timmer (2005).

At the national level, Ng and Aksoy (2010, p. 145) find that net food imports as a share of total imports in low income countries, other than oil exporters and countries in conflict, are 2 percent on average. They conclude that some low income countries did become more vulnerable as food prices rose in the mid-2000s, but that “[the] results do not indicate a very serious situation. The deterioration is about half a percent of GDP, on average, and relatively few countries are really vulnerable” (ibid., p. 158).

Overall, the authors in the World Bank volume find that the higher prices of recent years had the desired effect of raising production in middle income countries, while generating a smaller supply response in low income countries. In those cases, governments and donors need to invest in improving productivity and better connecting rural to urban markets, as many are starting to do. Most donor countries, however, maintain traditional subsidies for their own farmers even as they are increasing development aid for agriculture. The former undercuts the latter by distorting decisions about which commodities to plant where, increasing uncertainty about future prices and, at the margin, reducing incentives to invest in developing country agriculture. Biofuel policies have the opposite effect on prices, but they still distort decisions on where and in what commodities to invest. Some recent studies also suggest that high income country support for biofuels is a factor in the new competition for land in Africa and elsewhere (Kugelman 2012, introduction).

Finally, both kinds of policies exacerbate price volatility. Traditional farm support policies suppress global prices when they are already low while inflexible biofuel mandates add to demand for food crops even when prices are rising. While somewhat higher prices are useful to stimulate agricultural development in developing countries, the sudden, sharp spikes of recent years are not helpful for anyone (FAO et al. 2011). Food prices tend to be more volatile than other prices in general, but they appear to have become even more so in the mid-2000s—just when the United States and European Union ratcheted up their biofuel support (Huchet-Bourdon 2011, p. 19).

In sum, traditional agricultural support policies and new biofuel policies in rich countries distort production and trade decisions. They often work at cross purposes with development assistance aiming to improve food security and raise smallholder incomes. Moreover, the time to reform these policies is now, when prices are high and the value of subsidies and trade protection is relative low.

Agricultural Support Policies in Rich Countries Today

The aim of agricultural support policies in most developed economies is to support producer incomes, often by protecting them from price declines. Rising prices in the latter half of the 2000s caused countercyclical support to drop automatically across OECD countries. With encouragement from the World Trade Organization’s Uruguay Round Agreement on Agriculture, signed in 1994, some countries also adopted less distorting policies that partly or completely decoupled payments from production. But the decline in support varies widely

across countries and commodities. This section reviews trends in the level of support across countries and commodities and then examines the prospects for reform in the two largest markets, the European Union and United States.

Trends in Support across OECD Countries

Figure 3 shows OECD estimates of producer support as a percent of gross farm receipts (including support) for industrialized OECD members from 1986 to 2011.⁴ The nominal value of that support in 2011 was \$236 billion, just a bit below the peak of \$262 billion in 2004, but producer support as a share of gross farm receipts declined to an average of 19 percent, half of the peak levels in the mid-1980s. Within that overall average, there are wide differences in the level of support provided and three fairly distinct groups appear in figure 3. At the bottom, Australia and New Zealand are competitive agricultural exporters that long ago adopted reforms and eliminated most producer support. At the top are uncompetitive food-importing countries from northern Europe and northeastern Asia that heavily protect farmers at levels well above the OECD average. In the middle are Canada and the European Union, with United States a bit below.

The aim of the Uruguay Round Agreement on Agriculture was not to rule out agricultural support, but to encourage countries to shift from more to less distorting forms of support. The agreement created three categories of support that should be reduced or reformed: domestic support, tariffs and other trade barriers, and export subsidies. The agreement further divided domestic support into three boxes: amber for the most trade-distorting forms—those linked to current prices and production; blue for subsidies that are linked to current prices but have production-limiting features; and green for minimally-distorting forms of support.⁵ The WTO agreement requires members to report on how much support is being provided in each category, but there are often long lags and reporting inconsistencies. Moreover, while WTO members sometimes report subsidies for input use in the amber box as nonproduct-specific support—for example, irrigation subsidies—there are other apparently distorting payments for variable input use that appear in the OECD database and are not reported to the WTO. For a particularly egregious example involving energy subsidies, see box 1.⁶

⁴ The data in this section are from the OECD database of Producer and Consumer Support Estimates, available here <http://www.oecd.org/tad/agricultural-policies/producerandconsumersupportestimatesdatabase.htm>. The OECD also provides estimates for emerging market members of the organization as they join (Chile, Israel, Mexico, and Turkey to date), and publishes ad hoc estimates for other large emerging markets, including Brazil, China and Russia. I explore these estimates below.

⁵ See Elliott 2006, pp. 17-18, for a brief summary and the WTO website for more detailed information: http://www.wto.org/english/tratop_e/agric_e/ag_intro00_contents_e.htm.

⁶ For detailed analysis of key countries' compliance with WTO commitments, including discussion of some questionable measures that are not reported to the WTO, see Orden, Blandford, and Josling (2011).

Box 1 Support for Energy-Intensive Agriculture

Agricultural production in rich countries is highly mechanized, uses lots of fertilizer and other inputs and is highly energy intensive. Among countries subsidizing energy use on farms, the European Union is the largest, with average fuel tax rebates of \$4.5 billion annually in 2009-11 (\$24 per hectare). The fuel tax rebates are more than double the level of the mid-1990s and recently became the second largest category of direct payments after decoupled income support, ahead of environmental payments (European Parliament 2012, p. 93).

In 2009-11, the United States reported energy subsidies of \$2.5 billion per year, or \$6 per hectare. But the amount reported has been the same since the OECD began collecting these data in the mid-1980s and the source notes concede that the data “are problematic and need revision” (OECD 2013, p. 6). Other OECD countries also subsidize energy use, with Norway and Switzerland being the worst in relative terms with subsidies of \$56 and \$43 per hectare, respectively. Japan and Korea, have by far the highest energy intensity on their farms but do not subsidize energy use.

Just this one type of subsidy is more than three times as much as EU member states provided in agricultural aid to developing countries in 2011, and more than two-thirds greater than US agricultural aid. While energy use is far from the largest source of agricultural greenhouse gas emissions, it is a growing share of support to agriculture in a number of countries. These subsidies are, thus, doubly pernicious and eliminating them should be on the reform agenda. At a minimum, the WTO should clarify that members must include these subsidies in their amber box notifications.

Data sources: Energy subsidies data are from OECD: Estimate of Support to Agriculture; data on energy use and agricultural land are from 2013 Edition of the OECD Environmental Database. Both are available online from <http://www.oecd.org/agriculture/agricultural-policies/producerandconsumersupportestimatesdatabase.htm>. Data on official development assistance by sector are available at <http://www.oecd.org/dac/stats/idsonline.htm>.

While the OECD definitions and measurement methods for the various categories of producer support do not match up exactly with those of the WTO agricultural agreement, the OECD data are more comprehensive. In addition, the OECD measure is better for getting a sense of the current impact of trade barriers because the WTO (for bizarre negotiating reasons) measures levels of market price support against a historical base price from the late 1980s.

Examining the OECD data on trade-distorting support, we can again identify three broad groups.⁷ Korea and Japan, which are among those providing the largest amounts of support overall, also still provide most agricultural support in distorting forms. In the middle are Canada, Iceland, Norway, and Switzerland. The drop in Iceland's trade-distorting support in 1995 was the result of replacing output-based payments for sheep meat with payments based on historical numbers of animals, allowing them to report these payments in the blue box under the Uruguay Round agreement. Canada removed market price support for grains in the mid-1990s, but it maintains tight supply management policies for dairy, poultry, and eggs (fluctuations in the share of distorting policies are mainly due to fluctuations in the price of those products, especially dairy). Norway and Switzerland, which provide the highest levels of support overall, have at least moved towards less distorting forms of support. But the fact that government support is larger than market receipts (figure 3) surely has an impact on production.

The most striking shift visible in figure 4 is the fall in EU trade-distorting support from more than 90 percent of producer support in the 1980s to less than 20 percent in 2011 (figure 4).⁸ The share of US support that is most distorting is similarly low, but there is no discernible trend until the early 2000s and the downward trend then is mostly due to rising agricultural prices (the volatility in 2007-08 is due mainly to fluctuating dairy prices). Indeed, after one half-hearted attempt at reform in the mid-1990s, US policy mostly moved in the wrong direction after that (Elliott 2006, chapter 3). Meanwhile, the European Union, confronted with budget pressures and expanding membership, repeatedly reformed the Common Agricultural Policy (CAP) to make support less trade-distorting.⁹ But the European Union still provides around \$100 billion annually in producer support, three times as much as the United States and 50 percent more than Japan. That is large enough to affect production decisions, as David Orden (2013, p. 9) argues, by “easing credit constraints, and lowering risk aversion.”

The level of support in the European Union is also likely larger than what it would be had there been no reform because rising prices would have reduced the amount of market price support and export subsidies needed to maintain internal prices. But it is unclear how much lower support would be because the reductions in intervention prices under CAP reform might not have been politically feasible in the absence of compensatory payments. And the level of *distorting* support would be higher than where it is today. Similarly, US producer support is \$5 billion higher every year than it would be had the 1996 farm bill not introduced decoupled payments. But in the US case, there is no offsetting reduction in distorting forms

⁷ Australia and New Zealand are left out of this chart because their overall levels of support are so low and it makes the chart easier to follow.

⁸ The OECD defines market price support (typically enforced through trade barriers), payments linked to commodity output, and payments based on variable input use that is not constrained as the most distorting.

⁹ An analysis of EU agricultural policies, with comparisons to selected OECD countries, including the United States, was requested by the European Parliament's Committee on Agriculture and Rural Development (European Parliament 2012).

of support (except due to cyclical factors). The US Congress quickly introduced new forms of trade-distorting support when prices dropped in the late 1990s, yet the “compensatory” decoupled payments survived.

Trends in Support across Commodities

Just as support has come down unevenly across countries, certain commodities remain more sheltered from market forces than others. Table 1 shows the value of producer support for specific commodities as a share of gross farm receipts for each commodity. The more protectionist countries that cluster at the top of figures 3 and 4 support their uncompetitive farmers across the board, with only Iceland not also supporting some grains. Canada, the European Union and United States tend to be more selective. Overall support for particular commodities falls into four broad tranches:

- high levels of support for rice in Japan and Korea,
- moderate to high levels of support for sugar, particularly in the United States and Japan,
- moderate to high levels of support for dairy and at least some meat producers, and
- lower levels of support for grains and oilseeds in the major markets.¹⁰

The two most protected products across the OECD on average are tropical products where some developing countries could be major beneficiaries from reform. Rice is a key staple commodity in Asia and many governments in the region pursue self-sufficiency in the name of food security, making rice one of the least traded commodities globally. Still, among those with export capacity, developing countries accounted for more than two-thirds of the global total from 2007 to 2011, led by Thailand, India, and Vietnam.¹¹ These countries could be major beneficiaries if the European Union, Japan, and Korea liberalized their rice markets. For example, Cambodia’s rice exports to the European Union increased from almost nothing to nearly \$100 million after duty-free, quota-free market access under the Everything But Arms program was fully implemented in 2009.¹² The impact of liberalization in Japan and Korea might be smaller, since consumers prefer a different variety of rice than the ones typically grown elsewhere, but it should still be positive because food processors will welcome cheaper rice for use in noodles, crackers, and other products.

Many developing countries could also increase exports of sugarcane if not for high barriers in rich countries. Figure 5 shows the pattern of prices in the US, EU, and world markets. The United States briefly allowed the import quotas on sugar to lapse during the food price spikes and inflation of the 1970s, but policymakers quickly restored quotas when prices dropped in 1980-81. Supported by tight restrictions on imports, the US sugar price has been

¹⁰The OECD also reports data for those countries that support rapeseed, sunflower, and other oilseeds, but they are supported in only a few markets and at low levels.

¹¹ Data are from the United Nations comtrade database at <http://comtrade.un.org/db/>.

¹² EU imports from Thailand, by contrast, declined over the same period; see UN comtrade database.

well above world prices ever since.¹³ In the 2008 farm bill, Congress further mandated that the US Department of Agriculture should manage the sugar program so as to reserve 85 percent of the US market for domestic producers. The legislation also required that import quotas for imported sugar be set at “the minimum level necessary to comply with obligations under international trade agreements” and put additional restrictions on the department’s flexibility to allow additional imports even when shortages are expected.¹⁴

The EU’s support price for sugar in the 1990s and early 2000s was even higher than the US price, but the European Union lost a challenge to its sugar program at the WTO in 2005. By 2009, it had reduced its support price for sugar by a third and, with recent spikes in world prices due to weather in Brazil and the demand for ethanol, internal EU prices even fell a bit below the average world price. The European Commission proposed to eliminate domestic quotas and minimum prices for sugar in 2015, but ultimately struck a compromise to phase them out in 2017.¹⁵

Besides sugar, EU policies supporting meat production and US, as well as EU, support for dairy are mostly in the form of market price support that keeps local prices high by restricting imports, which then puts downward pressure on world prices. Market price support and trade barriers are also the major mechanism protecting rice producers in Japan and Korea.

It is important to recognize, however, that import restrictions are generally not addressed as part of subsidy reforms, which are often driven by budget pressures. In the European Union, for example, the sugar and dairy reforms will eliminate domestic production quotas, but the tariffs or other restrictions on many imports will remain. The EU’s Everything But Arms program provides duty-free, quota-free market access for imports from least-developed countries, including for sugar and rice after 2009. Some other countries have varying degrees of preferential access for agricultural commodities under free trade agreements or other preference programs. Countries outside these arrangements, however, face the same nominal level of trade barriers as they did following full implementation of the Uruguay Round agreement in the early 2000s.

Similarly in the United States, the elimination of domestic production quotas for peanuts and tobacco was not accompanied by trade liberalization (Orden 2005). Tobacco producers

¹³ The sharp rise in consumption of high fructose corn syrup and other corn sweeteners, from nothing in the late 1960s to more than half of the total sweetener market in the 1980s, was stimulated by these high sugar prices. The corn syrup share has been dropping somewhat in recent years as corn demand shifts to the biofuel market.

¹⁴ The provisions are summarized in a side-by-side comparison of the 2008 farm bill with its predecessor here: <http://webarchives.cdlib.org/sw1vh5dg3r/http://ers.usda.gov/FarmBill/2008/Titles/TitleIcommodities.htm#sugar>, accessed March 28, 2013.

¹⁵ On the debate over reform, see <http://www.euractiv.com/cap/sugar-lobbying-intensifies-ahead-news-517970>, accessed March 29, 2013; on the outcome, see European Commission (2013, p. 4).

received several years of direct payments as part of a buy-out of domestic production quotas; peanut producers opted to give up production quotas in exchange for subsidies under the traditional commodity programs. But there was no change in the quantitative restrictions facing potential peanut exporters and Malawi still faces a 350 percent over-quota tariff on tobacco exports.

Higher market prices do mean that some trade barriers have less bite today. For example, a specific tariff that is set at one euro per kilogram is equivalent to a 100 percent ad valorem tariff when the import price is one euro, but only 25 percent when the price is four euros. Tariff-rate quotas—which impose low duties up to a designated quantity and higher, generally prohibitive, duties over that amount—can also be less binding with higher prices. But both types of barriers remain in place on the most highly protected products and the negative impact on imports will ratchet back up as prices fall.

In sum, OECD producer support is down, but the fall is uneven across both countries and commodities. The degree to which declining support is due to policy reform versus automatic adjustment to rising prices also varies widely. Even when there is reform, trade barriers are rarely included—partly because they are off-budget and do not face the same fiscal pressures as subsidy payments, and partly because countries want to save them as bargaining chips for international negotiations. So an international agreement to discipline trade-distorting agricultural policies is still needed and it should be easier to do it *now*, when farm prices and incomes are high. Soaring prices did not lead to any reduction in support when the last US farm bill was written, but it is now five years later and prices remain at relatively high levels. The combination of sustained high commodity prices and budget pressures in rich countries make this the moment for a renewed push to discipline trade-distorting agricultural policies. I examine US and EU policies and the prospects for further reform in a later section.

A Brief Look at Emerging Market Policies

There are now data available on producer support for some emerging market economies, including Chile, Mexico, and Turkey, which are OECD members, and for a few others that cooperate by providing information to the OECD, notably Brazil, China, Russia, and South Africa.¹⁶ Given the growing importance of these countries in global markets, and the fact that the WTO places few disciplines on their policies because they are developing, it is useful to get an idea of what is happening with producer support in these countries.

¹⁶ Israel, an OECD member, is excluded from this discussion because it is small while Indonesia and Ukraine are excluded because the data are volatile. Unfortunately, India does not cooperate with the OECD and only recently reported its support as required by the WTO under the Agreement on Agriculture, so it is also absent in the discussion. Gopinath (in Orden et al. 2011) examines Indian policies and, in the absence of WTO reports at that time, created shadow notifications for India under the WTO agreement.

Overall, producer support as a share of gross farm receipts tends to fluctuate significantly in many of these economies and it is difficult to detect clear trends (figure 6). Brazil, Chile, and South Africa are competitive agricultural exporters where support is relatively low and generally declining. By 2010, support in these countries was less than 5 percent of farm receipts. Other emerging markets are more interventionist. Turkey is the only country with levels of support generally above the OECD average, though Russia reached that level recently. Mexico's support to producers increased sharply in the mid-1990s, perhaps in preparation for implementing the trade agreement with the United States and Canada (not shown in the chart), but it fell about half-way back in the first half of the 2000s and leveled off at around 13 percent in the late 2000s.

The potentially worrisome trend is the sharply increasing level of support in China, which could quickly reach OECD levels if it continues. Given China's size, creation of a productive, efficient, and sustainable agricultural sector is important for global food security and there is clearly a role for the public sector in supporting infrastructure, research and development, human capital, and other public goods. Trade-distorting forms of support, however, could have substantial negative spillovers for global markets.

Finally, table 2 provides information on the role of commodity-specific support in overall producer support for selected countries. The large negative numbers for grains in China and Russia are due to the governments in those countries taking steps to prevent full transmission of the 2008 price spikes into domestic markets, including by placing export restrictions on those commodities.¹⁷

Prospects for Reform in the Major Markets

Outside Australia and New Zealand, the prospects for further reform of agricultural support policies are decidedly mixed. Japan and Korea have shown little inclination to liberalize. The smaller Northern European countries have adopted some reforms to make support less distorting, but they maintain high levels overall. The United States and EU are the most important in terms of impact on global markets and both are facing challenges in agreeing on the next phase of farm policy-making, so the rest of this section briefly reviews prospects for reform in these two markets.

The European Union and CAP Reform

The EU's Common Agricultural Policy (CAP) originally relied on trade barriers and supply management to support market prices. Over time, the high level of intervention prices led to growing surpluses that had to be stored or sold on global markets with the help of export subsidies. By the mid-1980s, the costs of the policy led to budget pressures and trade

¹⁷ See the country chapter summaries at <http://www.oecd.org/tad/agricultural-policies/agriculturalpolicymonitoringandevaluation2011oecdcountriesandemergingeconomies.htm#country>, accessed March 28, 2013.

tensions that could no longer be ignored. Pressures for reform continued into the early 1990s because of the need to open up space for EU negotiators to make concessions in the Uruguay Round of trade negotiations, and then into the 2000s because of the need to integrate new members from Eastern Europe without breaking the budget.

CAP reforms to date follow a relatively consistent pattern of lowering intervention prices and compensating producers with payments that are increasingly decoupled from current production (Elliott 2006, pp. 38-40; OECD 2012, chapter 7). As shown in figure 7, initial reforms involved modest reductions in market price support and increased payments based on historical acres or numbers of animals, making them partially decoupled from current production. Then, in 2004, overall support levels began dropping sharply as market prices rose. Intervention prices were also cut and the partially decoupled payments were replaced with a “single farm payment” for income support that is independent of current production and prices.

While CAP programs are clearly less distorting today, they are still worth nearly 80 billion euros (roughly \$100 billion) and account for 20 percent of gross farm receipts on average. Moreover, farm groups and their political allies are not giving up the fight for public support. The latest CAP revision, which was to have been implemented this year, has been delayed to 2014 by budget disputes and the desire of some member states to continue some commodity-specific support. The European Commission pushed to continue to replace distorting support with payments to encourage compliance with policies promoting sustainability and to compensate farmers for providing environmental amenities and for protecting animal welfare. It also sought to cap payments to large producers and to make payments more equitable both across and within member states.

In June 2013, representatives of member states and the Parliament agreed to a CAP reform that makes 30 percent of the single farm payments (now the basic payment scheme) conditional on environmental performance and to eliminate production quotas for sugar (2017) and milk (2015). Key issues about how to allocate the budget across and within countries, how much flexibility to allow in retaining some commodity-specific payments, and whether to cap payments for large operators will be determined in future negotiations over the budget (OECD 2012, chapter 7; European Commission 2013; EuropeanVoice.com, June 26, 2013). The impact of these changes inside Europe will depend on the details of the final agreement, but the global impact will likely be muted as long as prices stay relatively high. The key issue for developing countries will remain the height of the barriers restricting trade with countries outside of preferential arrangements.

The Uncertain Road to Reform of US Agricultural Policy

The American story is more complicated over the past two decades, but, just as in the European Union, agricultural subsidies are under increasing pressure because of budget constraints. Similar pressures in the mid-1980s and 1990s contributed to the adoption of some reforms, but the path since 1996 has been erratic and the outcome of the 2013 debate

over a new farm bill remained uncertain at the time of writing. Based on the bills introduced so far, however, Congress appears to be diverging from the reform path outlined by WTO rules and US policy will be at risk of an international challenge when prices drop.

Changes to US farm policies to control expenditures and improve export competitiveness began in the 1960s. Congress adopted further reforms in the 1980s that continued the move away from supply management to support prices and towards price-linked subsidies that supported incomes. The sharp dip in support in 1995 (figure 8) is the result of both high prices and Congress' stab at more far reaching reform. For all but a few products, the 1996 farm bill replaced target prices and supply controls with decoupled direct payments, based on historical acreage and with no production required (the layer that appears on the top of the chart after 1995).¹⁸ Policies providing payments when prices fell below a legislatively set floor were retained, but reformers expected the decoupled income support payments to eventually replace other subsidies.

Shortly thereafter, commodity prices began to fall and farmers in many parts of the country were hit by natural disasters. Congress' appetite for reform waned just as quickly. The surge in support in figure 8 is partly due to policies responding automatically to price declines and partly to new interventions. Congress initially responded with ad hoc emergency relief bills for farmers and then it formally reversed course in the 2002 farm bill and restored target prices, though the payments were partially decoupled.¹⁹ The 2008 farm bill continued these policies with just minor tweaking, even though commodity prices were soaring. While price-linked subsidies fell to nearly zero, net payments (indemnities less premiums) for crop insurance grew sharply, reaching \$5.6 billion in 2011 (Zulauf and Orden 2012, p. 9-11).

With prices staying high, budget pressures growing, and farm incomes rising, the \$4.5 billion in decoupled direct payments to farmers is no longer politically viable and there is broad agreement in Congress to eliminate them. That, plus elimination of the partially decoupled target price payments (countercyclical payments) and another little-used program (ACRE), could generate nearly \$50 billion in budget saving over 10 years. But the House and Senate agriculture committees want to shift roughly three-quarters of that into new forms of insurance and price support, including expanded subsidies of \$5 billion to \$9 billion for crop insurance over that period.²⁰ Market failures are common in insurance markets and some government action is justified, but subsidies for crop insurance are already large and

¹⁸ See Elliott (2006, chapter 3) for a summary, and Orden, Paarlberg, and Roe (1999) for the full story. Note also that these reforms never applied to globally uncompetitive crops, such as sugar, tobacco, and peanuts, that receive price support through trade barriers.

¹⁹ These "counter-cyclical payments" are based on the difference between the market prices and a target price for eligible commodities, but are paid on only 85 percent of base-year acreage and production is not required.

²⁰ The Congressional Budget Office scores for the two bills are here <http://www.cbo.gov/sites/default/files/cbofiles/attachments/Agriculture%20Reform%20and%20Risk%20Management%20Act%20of%202013.pdf>, and here http://cbo.gov/sites/default/files/cbofiles/attachments/s954_StabenowLtr_0.pdf, accessed May 23, 2013.

growing. The share of crop insurance premiums paid by farmers fell from three-quarters in the early 1990s to 40 percent or less in the 2000s, and subsidies to private insurers to deliver crop insurance averaged \$1.3 billion per year from 2005 to 2009 (Zulauf and Orden 2012, pp. 9-11).

Both the House and Senate bills passed in 2013 include “shallow loss” programs that would cover much of the loss not covered by normal crop insurance. In addition, under pressure from southern crop producers (cotton, peanuts, and rice) that rely relatively more heavily on the direct and countercyclical payments, the House bill would allow farmers to choose between the new revenue insurance program and a new countercyclical payment based on fixed trigger prices.²¹ But this “price loss coverage” option would be even more distorting than the countercyclical program it replaces because the payments would be based on current production.²² The Senate proposed in 2012 to completely end countercyclical payments, but the agriculture committee yielded to pressure in 2013 and included an “adverse market payments” program. This would be similar to the countercyclical payments it would replace, but more market-oriented because the trigger price would be a moving average of market prices, rather than a fixed amount. Finally, both the House and Senate bills promise to “end payments to millionaires,” but only barely. The cap would be \$950,000 in adjusted gross income in the House bill and \$750,000 in the Senate.²³ While useful at least symbolically, clever operators often find ways around such caps and it has been difficult to tighten them in the past.

Overall, Babcock and Paulson (2012, p. 2) conclude that, if prices stay at the relatively high levels of recent years, payments under the new programs, and therefore the impact on planting decisions and world prices, would be modest. But price were softening after strong harvests in 2013 and the projections could prove wrong. Moreover, all the proposals, including the Senate’s relatively more market-based revenue insurance programs, are counter to the direction of reform adopted in the WTO (Orden 2013). As summarized by Babcock and Paulson (2012, p. 1):

The overall thrust of the new farm bill is that decoupled direct payments that have minimal impact on planting decisions will be replaced by coupled safety net programs that potentially have a large impact on planting decisions.

²¹ The differences in program payments by commodity are detailed here <http://farmdocdaily.illinois.edu/2013/05/payments-us-farm-safety-net-crops.html>, accessed August 29, 2013.

²² The details are complex but clearly explained in Zulauf and Orden (2012) and Babcock and Paulson (2012).

²³ Summaries and texts of the two bill are here <http://www.ag.senate.gov/issues/farm-bill>, and here <http://agriculture.house.gov/farmbill>, accessed May 23, 2013. Brief reviews of the process and politics behind the farm bill, as well as key differences in the House and Senate bills are here <http://farmdocdaily.illinois.edu/2013/07/2013-farm-bill-update-july.html> and here <http://farmdocdaily.illinois.edu/2013/08/farm-bill-conference-issues.html>, accessed August 29, 2013.

Particular problems could arise for the United States in the WTO context if the final farm bill does not sufficiently reduce support for cotton. In response to a complaint from Brazil several years ago, a WTO dispute settlement panel ruled that US cotton subsidies were inconsistent with its Uruguay Round commitments. After a US appeal of the decision failed, Congress made minor changes to the cotton program in the 2008 farm bill, but not enough to bring it into full compliance. In order to avoid WTO-authorized trade retaliation by Brazil, the US Trade Representative negotiated a compensation agreement that involves US taxpayers sending \$147 million a year to provide technical assistance and training to Brazilian cotton farmers.²⁴ So a key trade issue in the farm bill debate is how to finally resolve the cotton dispute with Brazil. Early in 2013, the trade associations representing cotton producers in the United States and Brazil reportedly worked out a secret agreement on how to do this and key elements of that understanding were incorporated in the House bill approved by the Agriculture Committee in May, mainly by dropping cotton from the proposed new countercyclical program.²⁵ Whether that will be enough to satisfy the Brazilian government was not yet clear at the time of writing.

Overall, by moving in a direction that is contrary to current international reform trends, these bills undermine US leadership and, in any future negotiation, could make it more difficult for US negotiators to accept the level of disciplines that they put on the table during the Doha Round (Zulauf and Orden 2012, p. 27-28). That, in turn, could be costly for US farmers as well as taxpayers if it means that emerging market policies continue to be almost entirely free from multilateral discipline, as currently appears likely.

As of late summer, however, the direction of US farm policy was very much up in the air. The House voted down the farm bill in June because of partisan differences over how deeply to cut domestic food aid and opposition from fiscal conservatives to subsidizing agriculture. The House leadership opted to carve domestic food aid out of the farm bill and the pared down bill passed, but it is unclear how that version will be reconciled with the Senate's broader bill.²⁶ One relatively bright spot in the debate was that an amendment to the House bill to reform how the United States delivers *foreign* food aid was defeated by just 17 votes. And key members of Congress, as well as the administration, are planning to revisit the issue.

Prospects for Reforming US Food Aid

The US Food for Peace program was created in the 1950s when the government relied on supply management policies to prop up commodity prices. When prices were low, the

²⁴ For details on the dispute and the framework agreement, see Schnepf (2010).

²⁵ "Industries Reach Deal On WTO Cotton Dispute; May Not Satisfy Brazil," Inside U.S. Trade, June 6, 2013.

²⁶ Domestic food aid, then known as food stamps, was added to the farm bill in the 1970s to attract the votes of urban legislators that would otherwise have little reason to vote for farm legislation. See Orden, Paarlberg, and Roe (1999, chapter 2).

government bought up surpluses and then had to dispose of them, sometimes by donating food overseas, or by selling it to developing country governments on concessional terms. Over time, US agricultural support policies shifted away from supply management and toward price-based subsidies that allowed American farmers to compete in export markets. But US food aid remains trapped in a 1950s time warp, where food must be bought in the United States and mostly transported (50 percent) on US-flagged ships. Over the years, as the constraints of in-kind only food aid became increasingly apparent, policymakers developed a costly work-around, called monetization. This practice involves the US government buying commodities and then donating them to implementing partners who, in turn, sell them in developing countries to raise money for their projects.

The costs and inefficiencies of these practices are well-documented, including in numerous Government Accountability Office (GAO) studies over the years. A GAO (2009) study comparing local and regional purchases by the World Food Program to in-kind food aid shipped from the United States found that the WFP transactions typically saved 14 weeks on shipments to Africa and cost an average of 34 percent less. Examining all destinations, food purchased locally was 25 percent less costly than US in-kind food aid. Another GAO study (2011) found that the costs of monetization averaged 25 percent for USAID programs and 40 percent for those overseen by the US Department of Agriculture. The latter analysis also concluded that these agencies could not ensure that monetization did not disrupt markets, as required by law, because they sometimes allowed relatively large amounts of food to be sold without proper market analysis and without ex post evaluation to assess market impact (*ibid.*, pp. 31-45).

An independent evaluation of a small local and regional purchase pilot program mandated in the 2008 farm bill (Management Systems International 2012), as well as a similar study by Lentz et al. (2012), reinforced the conclusions of the various GAO studies. The independent evaluation found that local or regional purchase generally saved an average of 10-14 weeks. Lentz et al. looked at transactions in nine very different countries and, not surprisingly, found smaller differences in delivery times for nearby countries (Guatemala) or those on major shipping routes (Bangladesh), but the delays were longer than the average for many land-locked countries and those not on major shipping routes, such as many of the major food aid recipients in Africa.

These two studies also found that using local or regional purchase, cash transfers, or vouchers was generally more cost effective than in-kind US food aid, though the savings varied depending on the type of commodity purchased. The independent evaluation by Management Systems International (2012) examined 385 transactions in 18 countries, 191 that used local or regional purchase and 194 that procured food in the United States. The evaluation found that commodity costs were generally lower in the United States, but that the costs for transportation, shipping and handling were large enough that purchasing cereals and pulses (beans and peas) locally or regionally cost roughly a third less on average. Lentz et al. (2012) analyzed 329 transactions, 144 of which used local or regional purchase. This study found cost savings on cereals of around 50 percent and around a quarter for pulses. Local or

regional purchase saved little if anything when vegetable oils or other processed foods were needed. Table 3 summarizes the results from these two studies.

Thus, the benefits of reform seem clear but the interests supporting the current system—farm organizations, implementing partners that use monetization to raise funds, and, especially, shipping companies and unions—are well-entrenched. In the mid-2000s, this “iron triangle” successfully defeated efforts by President George W. Bush’s administration to untie 25 percent of the food aid budget. A small, \$75 million, 5-year pilot project to study the effects of local and regional purchase was as far as Congress was willing to go back then.²⁷

In 2013, President Barack Obama tried again. The administration’s FY2014 budget proposed to eliminate monetization and untie the nonemergency food aid budget, as well as untying 45 percent of emergency food aid. For that portion of the emergency budget, the reform would allow the US Agency for International Development (USAID) to use local and regional purchase, cash transfers, or vouchers, whatever would best fit a given situation. The other half of emergency food aid would remain subject to the in-kind and cargo preference mandates.

Food aid reform now would be particularly timely. The United States is still the world’s single largest food aid donor, but higher prices mean that the same amount of aid today buys only half as much as it did a decade ago. In 2006, US food aid reached 60 million but that dropped to an average of just 30 million in 2010-11. At the same time, more people need help due to ongoing conflicts, increased price volatility, and more frequent weather shocks. USAID estimates conservatively that the administration’s reform proposal would allow the same level of funds aid to reach an additional 2 million to 4 million people. Elliott and McKitterick (2013) estimate that the number of additional people helped would be at least 4 million to 6 million and possibly as many as 10 million.²⁸

Moreover, momentum behind food aid reform seems to be greater than in the past.²⁹ An amendment to implement something like the administration’s proposal was defeated during the House debate on the farm bill, 203 for and 220 against, which was a narrower margin

²⁷ See Management Systems International (2012) for details on the farm bill provisions.

²⁸ Just as there are concerns about monetization or other in-kind food aid disrupting local markets and suppressing prices for local producers, local purchase could do the opposite if markets are not sufficiently flexible and well-integrated. Ensuring that increased flexibility leads to greater effectiveness requires careful evaluation of local market conditions.

²⁹ For example, many organizations implementing food aid programs in developing countries are increasingly frustrated with the costs associated with monetization and many of them are supporting at least some version of reform. See here for a statement of principles endorsed by several, <http://www.interaction.org/document/ngo-statement-principles-reforming-food-assistance-programs>, accessed August 22, 2013.

than for the farm bill as a whole (195 for and 234 against).³⁰ There would be important advantages from reviving reform efforts this fall, either in the farm bill or in the appropriations process. Trade ministers from WTO member governments will be meeting in Bali this December and many members would like to see export competition in agriculture on the agenda. Progress on US food aid reform could be the key that unlocks an agreement in this area, and gets the European Union to formally eliminate export subsidies (see box 2). Time is running out to pass reform in 2013, but this year's debate over food aid reform suggests that the tide is turning.

³⁰ Gawain Kripke has an analysis of the votes on the Oxfam America blog, <http://politicsofpoverty.oxfamamerica.org/2013/06/26/digging-into-the-numbers-of-the-food-aid-reform-vote-in-congress/>, accessed July 30, 2013.

Box 2 US Food Aid Reform: Key to a WTO Agreement on Export Competition?

The third pillar of agricultural support that the Doha Round attempted to tackle, along with domestic subsidies and trade barriers, was export subsidies. The European Union's has traditionally been the major user of export subsidies and it became a major irritant in US-EU relations in the 1980s. Trade negotiators eventually agreed to reduce and cap export subsidies in the Uruguay Round of trade negotiations (1986-93), but the European Union still retains the right to use up to €7.5 billion annually to subsidize agricultural exports.

In the Doha Round, the United States and other agricultural exporters wanted to go further and prohibit export subsidies for agriculture, just as they are for all other goods. EU export subsidies were already on a downward trajectory as a result of CAP reform, falling from an average of €5 billion per year in the late 1990s to around €3 billion per year when the Doha Round started in 2001, and less than €400 million in 2009.¹ Anticipating the continued decline, EU negotiators offered in principle to eliminate export subsidies, but they wanted to get something in return for making a legally binding commitment to do so. The Doha Round then stalled after 2008, but the potential value to others of locking in the EU offer was demonstrated during the financial crisis when the European Union resumed export subsidies for dairy products that had been phased out (albeit at a fraction of the permitted level).

What EU negotiators demanded in exchange for ending export subsidies was disciplines on other potentially distorting forms of export competition, including export credit guarantees, state trading organizations, and food aid. By 2006, progress had been made in many areas and the most contentious issue was the US use of in-kind food aid and monetization. EU negotiators argued that these practices could displace commercial sales from third countries and they wanted to restrict shipments of in-kind food aid to "well-defined emergencies" and eliminate monetization (Elliott 2006, pp. 92-95).

At the time, US negotiators did not feel that they could sell such an agreement to US Congress, but with the momentum behind food aid reform, perhaps there is space now for a deal. Certainly US farm groups should be supportive of this deal. It would mean that they give up sales to the food aid program that amount to less than 1 percent of exports in exchange for being assured they will never again have to compete with billions dollars in subsidized EU exports. And, if US and EU negotiators were willing to commit to disciplines on food aid and export subsidies, perhaps the emerging market and other developing countries that employ export restrictions would agree to at least some modest new disciplines to make any use of those measures more transparent and less disruptive in a crisis.

Biofuel Policies and Concerns About Food Security and Climate Change

When the Doha Round was launched in 2001, biofuel policies were not on many people's radar, much less on the trade agenda. Oil prices, like other commodity prices, were just beginning to turn up, there was little demand for ethanol, and biofuel support policies were relatively modest. A decade later, both markets and policies looked dramatically different.

While the relative contribution of biofuel policies to rising food prices remains contested, it is clear that the ratcheting up of biofuel support in the mid-2000s added a relatively large, new and inelastic source of demand for some food crops at a time when commodity prices were already rising.³¹ This created a number of concerns. In the short run, the use of quantitative mandates as a key policy tool means that biofuel demand cannot adjust to shocks and the full brunt of adjustment falls on food markets, exacerbating price volatility. Second, if biofuel demand continues to increase, and does so at a pace faster than yield growth, or if the competition for land between food and fuel leads to increased deforestation, then the food security of the poor could be endangered in the longer run as well.³²

Other demand-side pressures on food prices will not abate any time soon, with the global population increasing by three billion people by 2050 and rising incomes allowing more of them to eat meat and dairy products (FAO 2012, p. 6).³³ Economic growth is also putting upward pressure on energy prices and that contributes to the pressure on food prices directly, through higher production costs from use of machinery, transportation, and fertilizer, and indirectly, through increased demand for biofuels (Aksoy and Hoekman, 2011). In the late 2000s, these demand factors coincided with sharply falling global grain stocks, which left only a thin cushion to handle shocks. So, when a number of weather and other cyclical shocks hit in the mid-2000s, the price increases accelerated. A number of countries also adopted beggar-thy-neighbor trade policies that exacerbated the problem. This was also the time when the European Union and United States decided to ratchet up their biofuel support policies.

The Current Generation of Biofuels Fails to Achieve Goals

From the perspective of taxpayers and consumers in countries supporting biofuels, the policies so far have been generally ineffective in achieving stated goals of energy independence or reducing greenhouse gas emissions. They have also, thus far, failed to stimulate the development of more efficient second-generation fuels that might be more

³¹ See Elliott (2008) and the sources cited therein for an overview of the debate on causes of the 2007-08 price spikes.

³² Naylor et al. (2007) explore the "ripple effects" of biofuels on food security and the environment.

³³ The ratio of feed grains needed per pound of meat ranges from 3:1 for poultry to around 7:1 for pork and beef (Trostle 2008, p. 12).

effective and avoid the food versus fuel tradeoff. In the United States, roughly 40 percent of the corn crop goes into ethanol but it replaces only 10 percent of gasoline consumption. In the European Union, biofuels are under 5 percent of all transportation fuels (below the mandated level of 5.75 percent), yet biodiesel uses 65 percent of domestic oilseed production (OECD-FAO 2012, p. 88). Only in Brazil do biofuels come close to meeting stated goals. Brazil achieved its target of a 20 percent share of biofuels in gasoline with large initial subsidies for infrastructure and to stimulate demand. But Brazil is also a major producer of sugarcane, which is a relatively efficient ethanol feedstock, economically and in terms of reducing greenhouse gas emissions (OECD 2008, chapter 1).

The primary feedstocks in the United States and European Union—corn for ethanol and rapeseed for biodiesel, respectively—are economically less efficient than Brazilian sugarcane and they do not reduce greenhouse gas emissions much if at all. Measured over the full life cycle, estimates of the relative reductions in greenhouse gas emissions vary widely depending on a number of other factors, including the conditions under which crops are grown, the process used to convert them to fuel (especially the energy source used in processing—biomass, coal, or natural gas), and whether useful co-products result (for example, the “distillers’ grains” leftover from producing corn ethanol can be used for cattle feed).

Table 4 shows a range of estimates of life cycle reductions in greenhouse gas emissions from replacing gasoline or diesel with biofuels, including the official benchmarks used to determine eligibility under the US and EU mandates. Many studies suggest that direct and indirect land use changes are important factors in determining whether biofuels contribute to climate change mitigation (Fargione et al. 2008; Searchinger et al. 2008). Most support policies have restrictions on using feedstocks where cultivation directly leads to deforestation or other damaging land use changes (Timilsina and Shrestha, 2010, pp. 24-26). Indirect land use change arises from the need to replace the food supplies that are diverted to biofuels, which can contribute to climate change if, for example, forests are cleared for new cropland. Those changes are particularly difficult to measure and many studies do not include indirect land use change (Yacobucci and Bracmort 2010).

Under the US Renewable Fuel Standard (RFS), conventional biofuels must reduce emissions by at least 20 percent relative to gasoline, including an estimate of indirect land use change, in order to qualify under the RFS mandate. As shown in the table 4, corn-based ethanol just barely meets that threshold and then only if produced using certain production methods and natural gas rather than coal. Ethanol plants where construction started before Congress added these conditions in 2007 are grandfathered and do not have to comply, meaning they may well be net contributors to climate change. For advanced biofuels, the minimum reduction is 50 percent for sugar-based ethanol, biodiesel, and other first-generation biofuels, and 60 percent for advanced biofuels.

Under the EU policy, all biofuels have to reduce emissions relative to petroleum-based fuels by at least 35 percent, not including an assessment of indirect land use changes, with the threshold rising in 2017 to 50 percent for existing plants and 60 percent for new ones. As in

the United States, the key feedstock in Europe just barely makes the grade and it might well not meet the threshold for emissions reductions if indirect land use change were included. Laborde (2011, pp. 12-13) finds that estimated land use changes from implementing the EU mandate would eliminate more than two-thirds of potential emissions savings from using biofuels overall and that net savings from using biodiesel, which dominates in Europe, range from -12 percent to +6, depending on the feedstock.

Growing Biofuel Support, Demand and a Backlash

Subsidies, mandates, and other support policies—along with rising petroleum prices that made them relatively more competitive—led to sharply increasing demand for biofuels over the past decade (HLPE on Food Security and Nutrition 2013, p. 6). In 2000, global biofuel consumption was just over 4 billion gallons, mostly sugarcane-based ethanol in Brazil and corn-based ethanol in the United States.³⁴ A decade later, global consumption was more than five times larger and the United States accounted for more than half of the total (figure 9). EU consumption increased sharply, but from essentially zero and in 2011 it was still less than 20 percent of global biofuel consumption. A number of other countries also adopted mandates or targets for biofuel use in recent years, but many governments are becoming more cautious, few mandates are being met, and production and consumption outside the three largest markets remains small (IEA 2011, pp. 10-12; Timilsina and Shrestha 2010, pp. 6-8, 12).

Brazil, a major sugarcane producer and oil importer, was the first to promote biofuels in a major way. It implemented tax incentives and a blending mandate to supporting the development of ethanol in response to the 1970s oil price shocks and since then ethanol has generally accounted for between 20 percent and 25 percent of transportation fuel consumption (Valdez 2011, p. 45). Brazil's policy also emphasizes flexibility, so Brazilian mills can easily switch between producing sugar and ethanol. In 2003, the Brazilian auto industry introduced (tax-preferred) flex fuel cars that can handle different ethanol-gasoline blends and those vehicles now account for not quite half of the vehicle fleet. Sugarcane is the most efficient biofuel feedstock in commercial use, in part because producers use the cane biomass to power their mills, which also further reduces greenhouse gas emissions. Brazil continues to provide various financial incentives to support ethanol, as well as maintaining the blending mandate, but the government ended price controls and other direct interventions in sugar and ethanol markets in 1999 and there were no major changes to biofuel policies in the 2000s (Valdes 2011, p. 46).

What stands out in figure 9 is how American and European policymakers doubled down on their biofuel support policies in the late 2000s, even as food prices spiked. Both the United States and EU member states provided various tax incentives and other subsidies to

³⁴ All data is from the U.S. Energy Information Administration, International Energy Statistics, at <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=79&pid=79&aid=1>, accessed March 28, 2013.

promote biofuel production and consumption earlier, but these were relatively modest and had little impact until they were supplemented with blending mandates in the mid-2000s.

The EU's 2003 directive on biofuels authorized member states to adopt policies to ensure that biofuels would reach 2 percent of transportation fuels by 2005, rising to 5.75 percent in 2010 (HLPE on Food Security and Nutrition 2013, p. 7). In 2009, even though food prices were again rising and the actual blend level was only a bit over 4 percent, the EU raised the target to 10 percent of transportation fuels by 2020 (Flach et al. 2011). After food prices spiked again in 2010-11, the political backlash intensified and the European Commission proposed to change the directive, retaining the overall target but capping food crop-based biofuels at 5 percent. In July 2013, the environmental committee of the European Parliament voted for a slightly higher cap of 5.5 percent and, unlike the Commission, it also recommended the inclusion of indirect land use change in the calculation of net emissions impact. The full parliament will vote on the proposed changes this fall.³⁵

Corn-based ethanol, which is dominant in the United States, is relatively more cost-competitive than biodiesel under current conditions, but US biofuel policy is also facing political, economic, and technological challenges. Figure 10 illustrates the sharp rise in the US corn price as ethanol production accelerated in response to policy incentives and oil prices. The initial bump in ethanol demand arose when several large states concluded that methyl tertiary butyl ether (MTBE), an additive to make gasoline burn cleaner, was contaminating groundwater. Beginning in 2003, California and New York began to phase out the use as an oxygenate of MTBE and refiners turned to ethanol as a replacement. Adding ethanol as an oxygenate also allows refiners to blend in cheaper, lower octane gasoline and ethanol demand would likely stay at around 6 percent of gasoline consumption for that purpose even without the RFS mandate (Abbott 2013, p. 8).

Ethanol industry growth accelerated after Congress mandated rising levels of biofuels in 2005. At about the same time, oil prices turned sharply upward, which helped make the ethanol industry more competitive. The mandate started at 4 billion gallons in 2006 and was set to rise to 7.5 billion gallons by 2012. With gasoline prices rising rapidly, however, actual production exceeded the mandate and Congress doubled the blend target for ethanol to 9 billion gallons in 2008, rising to 36 billion gallons by 2022. Of the total, however, no more than 15 billion gallons can be conventional (usually corn-based) ethanol after 2014. The balance of the mandate must be advanced biofuels, with separate amounts under that ceiling for biodiesel, cellulosic biofuels, and "other advanced" biofuels (Yacobucci and Bracmort 2010, p. 4).

With the increase in ethanol demand, the cost of the 1970s-era tax credit for blending ethanol in gasoline, which fluctuated around \$0.50 per gallon, rose to \$6 billion. In 2011, Congress let the tax credit expire (along with an import duty designed to ensure foreign fuels

³⁵ http://www.resource.uk.com/article/Futurevision/EU_votes_cap_biofuels_food_crops-3325, accessed August 6, 2013.

did not benefit from the subsidy). While the industry would not have gotten off the ground without government subsidies and the mandate, ethanol production has been at or above the mandated level in every year and high gasoline prices are now an important driver of demand. Figure 10 shows the close correlation between oil prices and ethanol production, but little or no correlation between corn and oil prices until the mid-2000s when the mandate was implemented and they begin to move together.

The mandate, however, is reaching a point where automobile technology imposes constraints on ethanol use. Until 2011, only gasoline with up to 10 percent ethanol was approved for use in unmodified vehicles in the United States. Although the EPA relaxed this constraint for newer vehicles, ethanol is bumping up against the “blend wall” and there will have to be adjustments to the mandate in 2014 (see box 3). The advanced biofuels part of the mandate is creating yet other distortions and odd results. *The New York Times* reported last year that fuel producers would pay penalties to the U.S. Treasury of \$7 million and up in 2011 and 2012 for not using mandated levels of advanced biofuels that *do not exist*.³⁶ Despite many years of effort and billions of dollars in subsidies, second generation biofuels are still not commercially viable and are not expected to become so anytime soon (Schnepf and Yacobucci, 2013). So far, the EPA has chosen to sharply reduce but not completely waive the mandated level for cellulosic biofuels in the (unrealized) hope that it will serve as an incentive to innovators and investors.

The OECD-FAO Agricultural Outlook for 2012-21 examines three scenarios for how the EPA might handle the growing shortfall in cellulosic biofuels as the target level rises to 16 billion gallons by 2022. In the first scenario, the EPA lowers the advanced and total mandate levels by the amount of the cellulosic biofuel shortfall, which has minimal market impacts relative to the baseline. In the second scenario, the EPA retains the overall and advanced mandates, but allows “other advanced” biofuels to fill the gap for cellulosic, which means importing more sugar-based ethanol from Brazil. This is essentially what the EPA has been doing to date, but it becomes more difficult as the cellulosic gap grows larger and the OECD-FAO Outlook projects that it would result in an odd, inefficient circular trade. To fill the “other advanced” category, imports from Brazil would triple from baseline levels and US production of corn-based ethanol would have to rise 10 percent to meet increased import demand in Brazil to meet ethanol needs there. Despite the costs from distorted trade flow, this scenario results in relatively modest impacts on markets overall. In the final scenario, the Outlook assumes that the EPA retains the overall mandate and allows conventional ethanol to fill the cellulosic gap. In that case, corn production rises by 35 percent and the corn price by 16 percent.

Under a number of scenarios, trade could be a second-best mechanism for reducing the economic costs of biofuel policies, but these policies are not immune from protectionist

³⁶ <http://www.nytimes.com/2012/01/10/business/energy-environment/companies-face-fines-for-not-using-unavailable-biofuel.html>; OECD (2008, p. 39).

pressures from agricultural interests. Although the United States allowed the import duty on imported ethanol to expire at the same time that the tax credit did at the end of 2011. Brazil and the European Union retain relatively high tariffs on biofuels. Even more contentious are the sustainability conditions for determining the eligibility of biofuels under the US and EU mandates. Climate change concerns are reflected in eligibility conditions under biofuel policies that prohibit feedstocks or production processes that do not meet thresholds for net reductions in greenhouse gas emissions (table 3). In some cases there are flat prohibitions, for example on feedstocks grown on land that was converted from virgin forest, or, under a recent EPA decision, for palm oil. But such conditions are also hard to implement in clear, transparent, and nondiscriminatory fashion. Even if they are, it can be difficult or costly to demonstrate compliance with such standards, especially for developing countries with limited administrative capacity.

In sum, the current generation of US and EU biofuels are not contributing significantly to energy security or climate change mitigation, but they are contributing to higher and more volatile food prices. The policies supporting them are also more complicated, inflexible, and distorting than they need to be, and this could contribute to new trade and environment conflicts. If the political will to scrap these inefficient policies is lacking, the policies should at least be reformed. Thanks to past subsidies and with continued high energy prices, the Brazilian and American ethanol industries might be competitive around current levels of production even without further subsidies or mandates. The European industry faces greater challenges because of the reliance on biodiesel with its relatively higher feedstock and processing costs, along with the political backlash there over food prices and land use issues. The European Union is already acting to scale back its mandate for biofuels based on food crops. But, if it is unwilling to eliminate it altogether, policymakers need to ensure that the sustainability standards are transparent and do not unnecessarily impede trade.

In the United States, key policy challenges relate to the uncertainty around the EPA's future interpretation of the biofuel mandates. Research and development into second generation biofuels might merit continued government funding, but the mandate for cellulosic biofuel will not come close to being met anytime soon and, as illustrated by the OECD-FAO scenarios, how the EPA handles the overall and advanced biofuel mandates has very different implications for markets. If Congress does not eliminate or sharply scale back the mandate, the best available option would be to lower the total mandate by the amount of the shortfall in cellulosic biofuels and maintain low trade barriers so that more efficient Brazilian ethanol can come in if there is market demand for it. The third scenario, of maintaining the total mandate level and allowing corn-based ethanol to fill the cellulosic gap, is clearly the worst option but it also seems the least likely because of the backlash from livestock producers, environmentalists, and others that it would provoke.

Box 3 Embracing the Ethanol Blend Wall

There is a growing backlash against the biofuels mandate and the increase in ethanol consumption. Development advocates are concerned about the rising costs of feeding people while livestock producers are angry about the rising costs of feeding cattle and pigs. Automobile manufacturers worry about the potential impact on engines from higher ethanol blends. Gasoline refiners are facing a situation where they could be fined millions of dollars for not buying products that either do not exist or for which there is no demand (ethanol blends beyond 10 percent).

The Environmental Protection Agency (EPA) has authority to waive all or part of the mandate if it threatens the US economy, but it has been reluctant to use it. It rejected petitions from Texas Governor Rick Perry and governors of other large livestock producing states during the 2008 price spikes, and it did so again when the 2012 drought hammered the corn belt. But it is not clear that a waiver in those situations would have made much difference. Several studies suggest that, thanks to past subsidies, corn-based ethanol is established enough that it is competitive when gasoline and corn prices are in recent ranges (see [here](#) for one calculation of the corn-to-crude oil breakeven price ratio). These studies conclude that eliminating the mandate, even during the severe drought of 2012, would not have made much difference for biofuel production or corn prices (Babcock 2012, Thompson et al. 2012).

The EPA recognizes that 2014 is going to be different, thanks to the blend wall. When the mandate was revised upwards in 2007, the Energy Information Agency estimated US gasoline consumption at 145 billion gallons and projected continued growth, so that the “blend wall” was not expected to be an issue with traditional ethanol capped at 15 billion gallons (Schnepf and Yacobucci 2013, p. 29). With annual US gasoline consumption now down to around 135 billion gallons, the industry is now running into this blend wall. The EPA raised the ethanol blend ceiling for vehicles built in 2001 or later to 15 percent, but there are a number of obstacles to adoption in the medium run. First, automobile manufacturers approved E15 for 2013 and later models, but warned that warranties might not be valid on older vehicles if accidental fueling with E15 damaged engines. Second, different blends for different model-year vehicles would require different storage tanks and pumps so gasoline retailers are showing little interest and consumers are not demanding the higher blend (EIA 2012, p. 5). As newer vehicles enter the market, however, those constraints could ease and if E15 eventually becomes the norm, demand could be as high as 20 billion gallons of ethanol, which would require up to 60 percent of the US corn supply (assuming constant yields and total gasoline consumption of 130 billion gallons).

In response to the growing concerns, the House Energy and Commerce Committee is examining possible changes to the Renewable Fuel Standard. One simple but helpful change would be to change the mandated target from billions of gallons to a percentage of fuel consumption. Setting the new target for conventional biofuels at *no more* than 10 percent of gasoline consumption would address the blend wall problem and effectively cap corn-based ethanol consumption at about the current level.

Conclusions and Recommendations

The debate over the impact that rich-country agricultural policies have on the poor in developing countries changed markedly over the past decade. With commodity prices surging, the focus shifted away from price-suppressing subsidies and trade barriers that injured developing-country producers; it shifted toward biofuel support and other policies that drive up prices and increase food insecurity for some. The answer to whether agricultural price increases are good or bad for the poor is not yes or no, but that it depends.³⁷ Overall, World Bank research that examines direct *and* indirect effects of food prices increases finds that they are overall positive for the poor under a variety of circumstances (Aksoy and Hoekman 2010). Moreover, whatever the *level* of food and agricultural prices, both traditional OECD support policies and biofuel policies exacerbate price *volatility* and that is a problem for poor consumers and producers alike.

Another reason that traditional OECD support for agriculture faded from the headlines is that high prices led to low levels of (countercyclical) subsidies in major markets. Agricultural support is also less trade distorting than it used to be as a result of reforms in some countries. But trade-distorting policies remain in place, including in the United States, and if prices do fall again, subsidies will bounce back automatically. Many of the sectors with the highest remaining levels of support are also of particular interest to developing countries, such as sugar and rice. So those concerned about global poverty and agricultural development should not abandon their efforts to strengthen international trade rules and lock in the currently low levels of agricultural support *now*, while prices are relatively high.

As for biofuel support policies in rich countries, they are not a concern because they put upward pressure on prices per se, but because they are inefficient, mostly ineffective (especially with respect to climate change), and they contribute to food price volatility. In addition, in the absence of international agreement to define them, sustainability standards intended to ensure that biofuels achieve their environmental goals are creating disputes and putting further strains on the international trade system.

There is, thus, ample material for an international agreement on food security and agricultural trade:

- to lock in low subsidies and reforms in high income countries
- to channel developing country policies towards less trade-distorting investments in infrastructure and rural public goods
- to discipline export competition by eliminating export subsidies, reforming in-kind food aid, and restraining export restrictions
- to eliminate subsidies for energy use in agriculture

³⁷ Peter Timmer will explore lessons from the past for developing countries and donors grappling with these issues today in a book scheduled to be published by the Center for Global Development next year.

- to discipline biofuel policies to increase flexibility and market responsiveness
- to adopt guidelines for calculating life-cycle greenhouse gas emissions, including indirect land use change, and for setting other sustainability standards for biofuels.

Many of these issues are on the agenda of the comatose Doha Round but chances are dim that the round will be revived. And biofuel policies are not currently on the table at all. Rather than trying to tackle everything at once, a flexible approach might be more feasible.

Trade ministers from WTO member countries will be meeting in Bali at the end of this year and a key issue will be what to do about the Doha Round and how to move the organization forward. Policymakers seem unwilling to admit failure in the round so, in a recent CGD brief (Elliott 2013), I suggested that negotiators salvage what they can in Bali, declare victory, and then move on. Two areas on every list of what might be achieved are trade facilitation and least-developed country issues, perhaps including duty-free, quota-free market access for their exports.

The third basket of issues in which members are looking for compromises is agriculture. Brazil proposed relatively modest, but also useful and relatively noncontroversial, changes to tariff-rate quota administration to facilitate in-quota imports.³⁸ Many WTO members would also like to see some discipline on the use of export restrictions to avoid a repeat of the beggar-thy-neighbor policies that exacerbated the food price spikes in 2007-08. At a minimum, member countries should agree to be more transparent in their use of such measures, to consult with other WTO members in advance, and to honor World Food Program contracts for emergency food shipments.

Developing countries might be more willing to agree to disciplines on export restrictions if developed countries agree to disciplines on the distorting export competition measures that they use, as promised in the Doha Round. The European Union put agricultural export subsidies on the table in the round, and EU export subsidies are minimal today for most products. But in the WTO bargaining model, EU negotiators demanded that the United States also must reform its in-kind food aid system. President Obama's FY 2014 budget proposed a major reform of food aid and, if Congress approves, that could set the stage for a broader deal on export competition in Bali.

This would be a good time to tackle the other distortions to agricultural trade because high prices mean that the adjustment would be minor for producers in developed countries, and for consumers in developing countries. Despite that, a breakthrough in the overall Doha negotiations remains elusive. Agreement in Bali on a package of measures on export competition and TRQ administration would be a modest step but one worth taking. The

³⁸ Tariff-rate quotas allow a designated amount of imports to enter at a low tariff rate, with imports above that level subject to much higher, often prohibitive, tariffs. Even at the lower rate, however, quotas are often unfilled and the Brazilian proposal addresses administrative obstacles that contribute to that, especially for developing countries.

broader issues around agricultural support will not disappear, however, and new ones, such as the growth of agricultural subsidies in emerging markets and support for biofuels globally, need to be addressed. Thus, a food security round should be on the WTO agenda after Bali.

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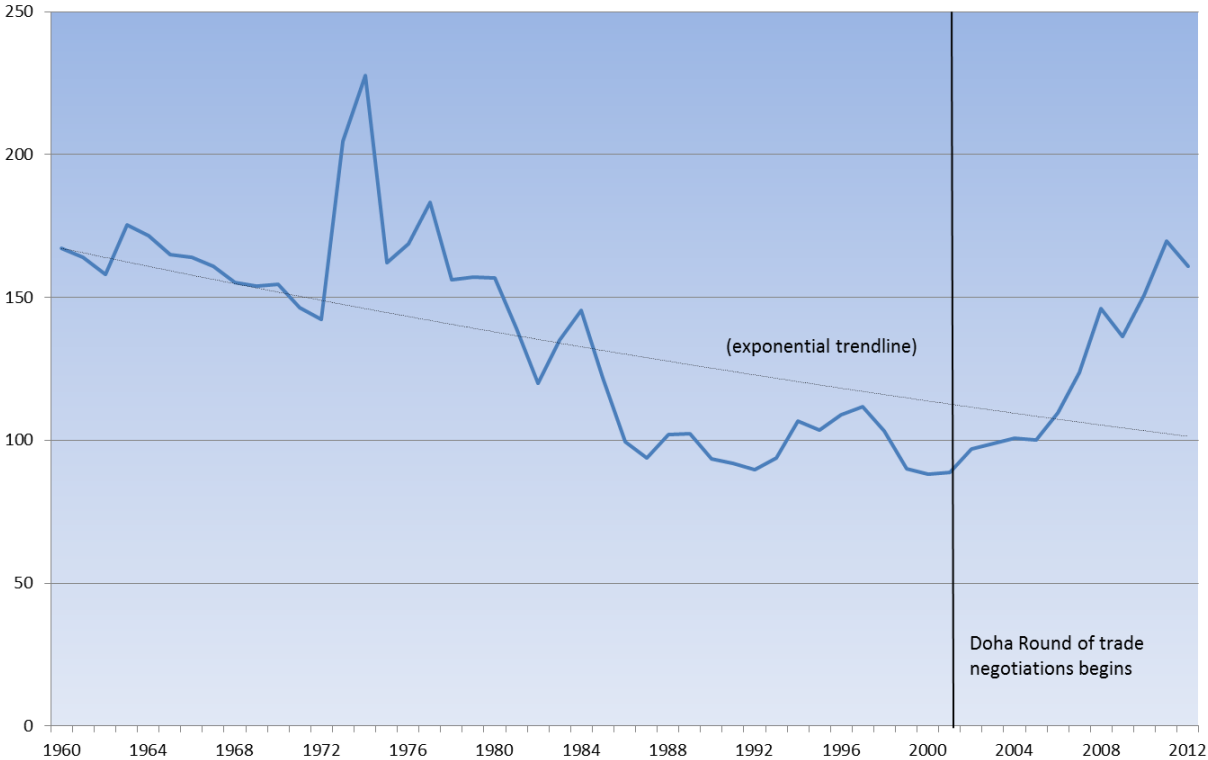
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Figures

Figure 1: Real Price Index for Agricultural Commodities (2005=100)



Source: World Bank Commodity Markets Data (accessed 1/8/2013)

Figure 2: Monthly Nominal Price Indices (2005=100)

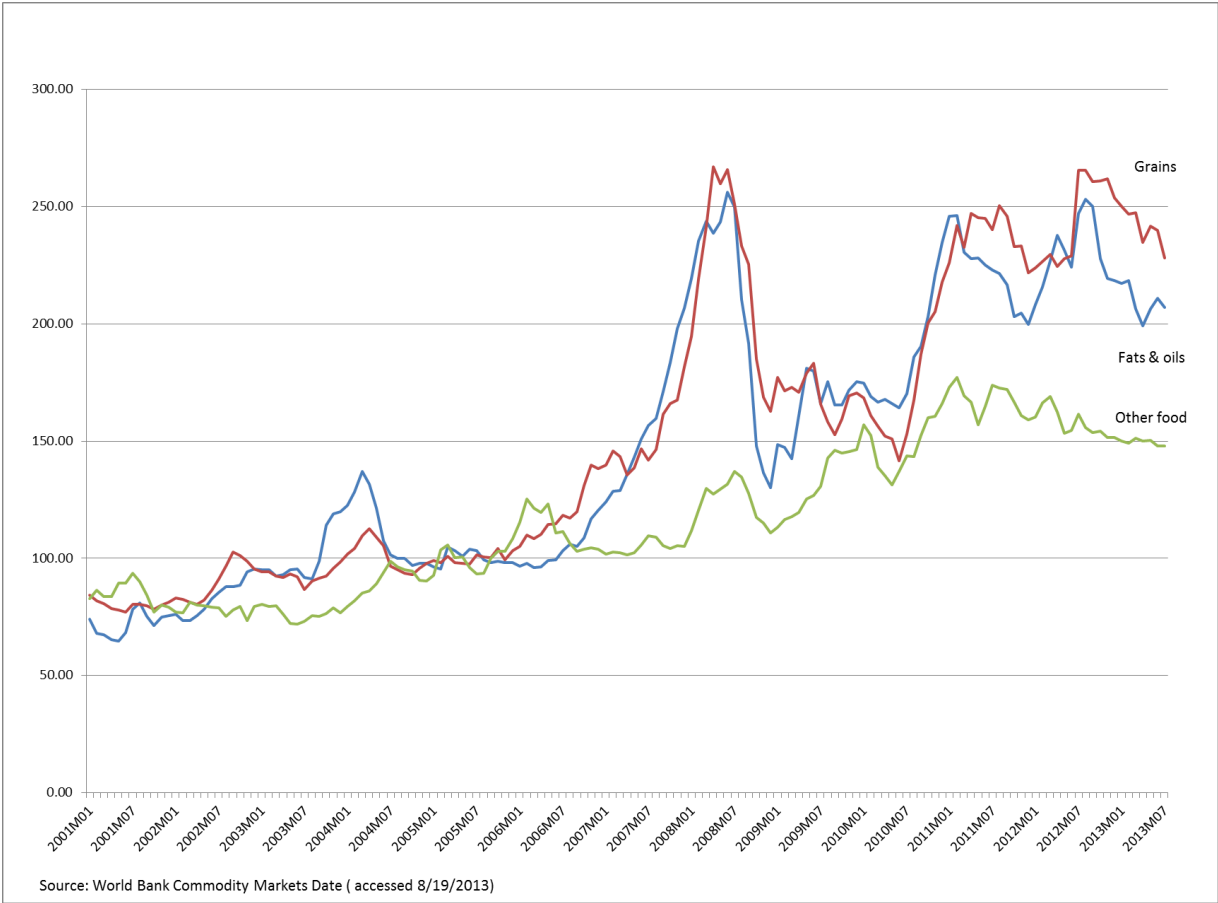


Figure 3: Estimated Producer Support as Percent of Gross Farm Receipts

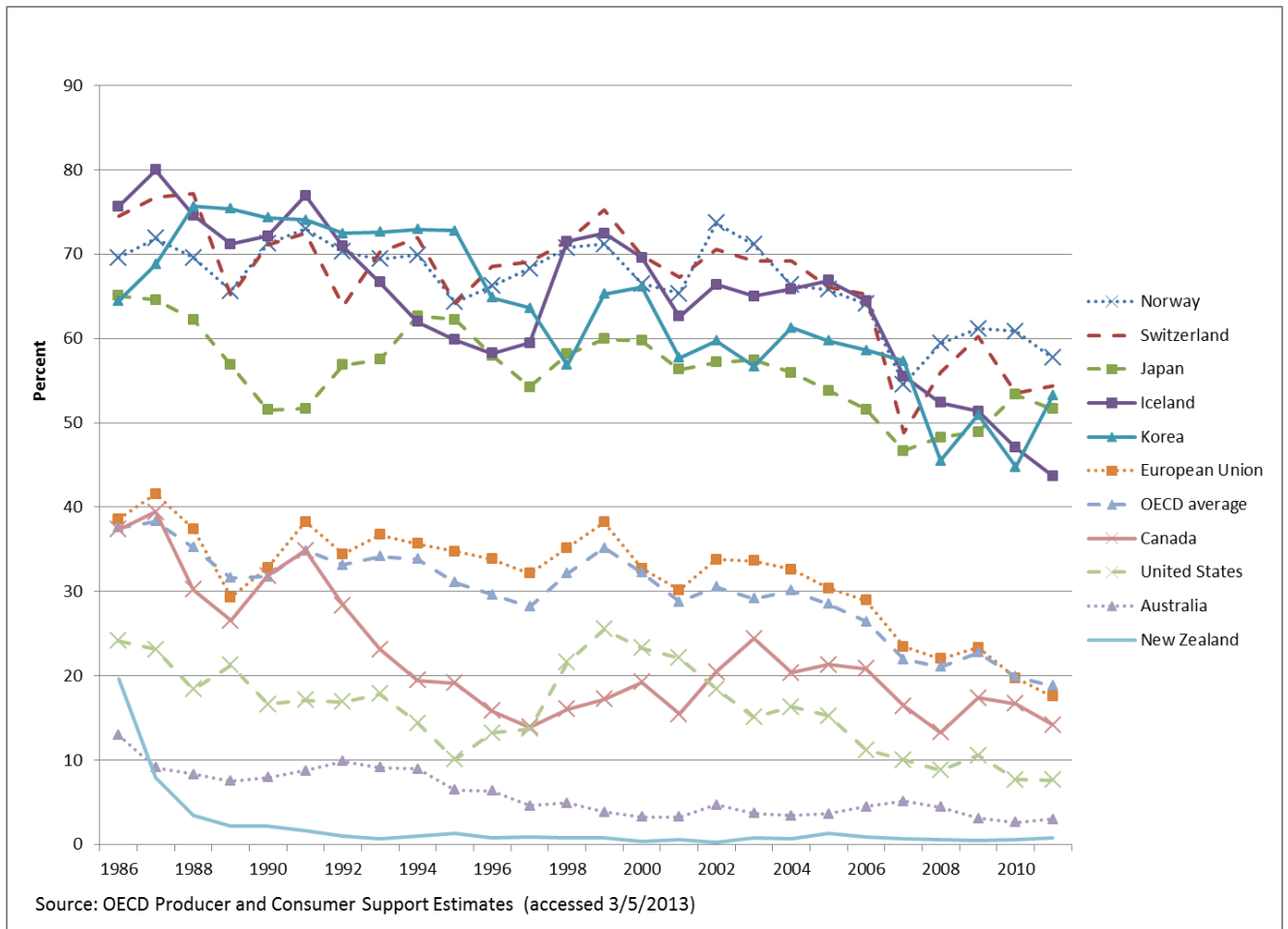


Figure 4: Percent of Producer Support In Most Distorting Forms
 (output-based support and payments based on unconstrained variable input use)

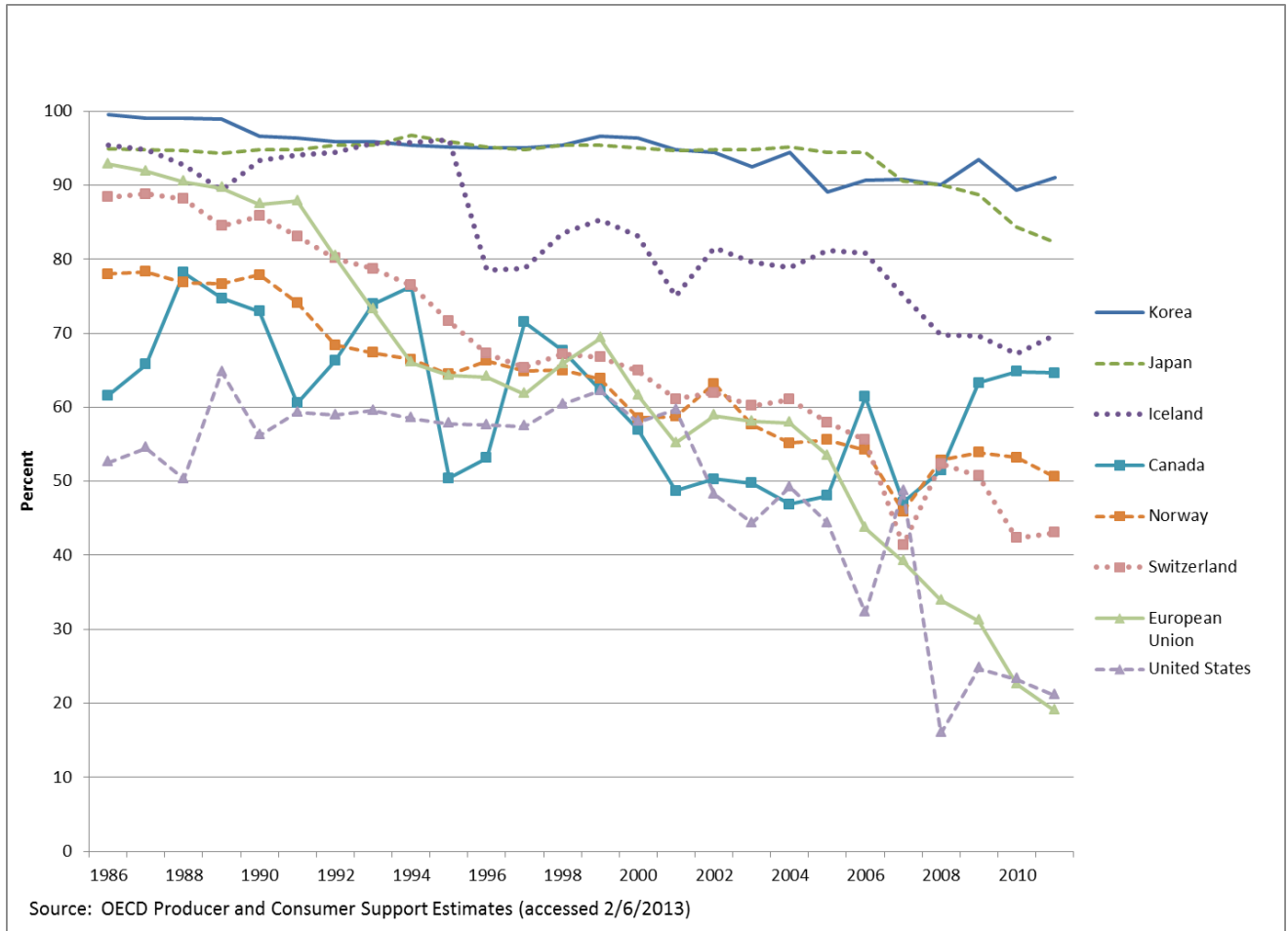


Figure 5: Sugar Prices in Major Markets
(US cents/kg)

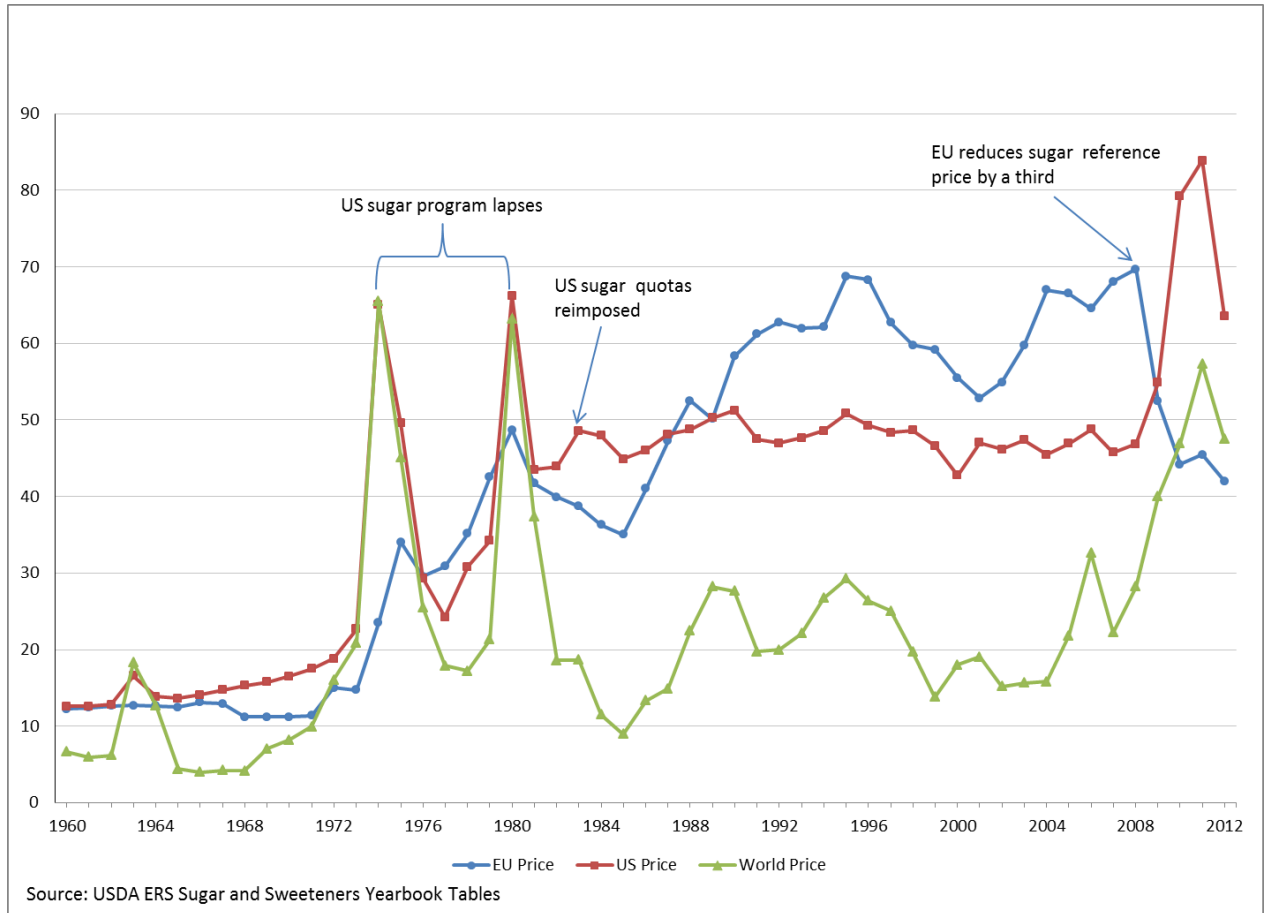


Figure 6: Estimates of Producer Support in Major Emerging Market Economies

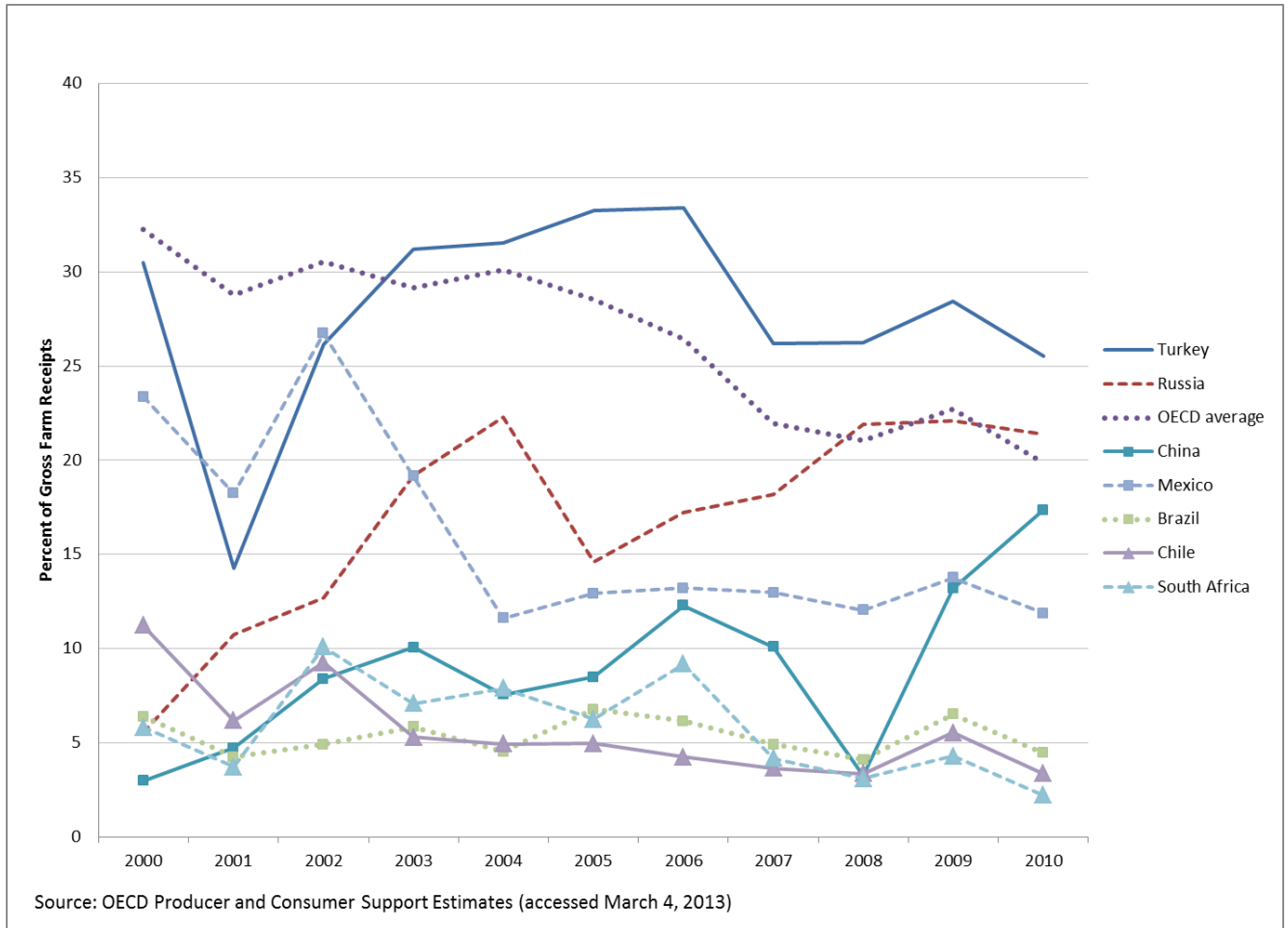


Figure 7: Composition of Producer Support in the EU
 (millions of euros)

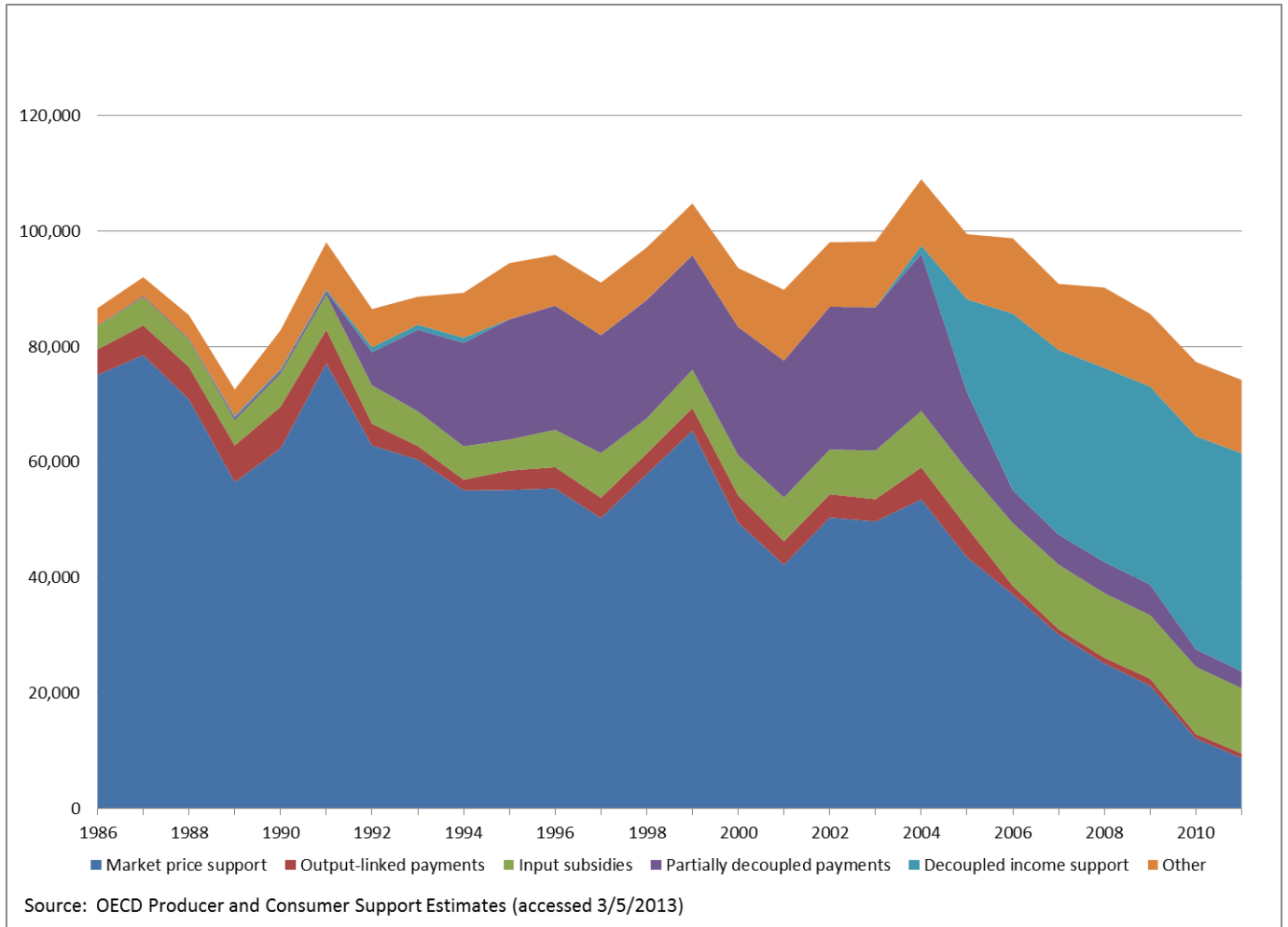


Figure 8: Composition of Producer Support in the US
(millions of dollars)

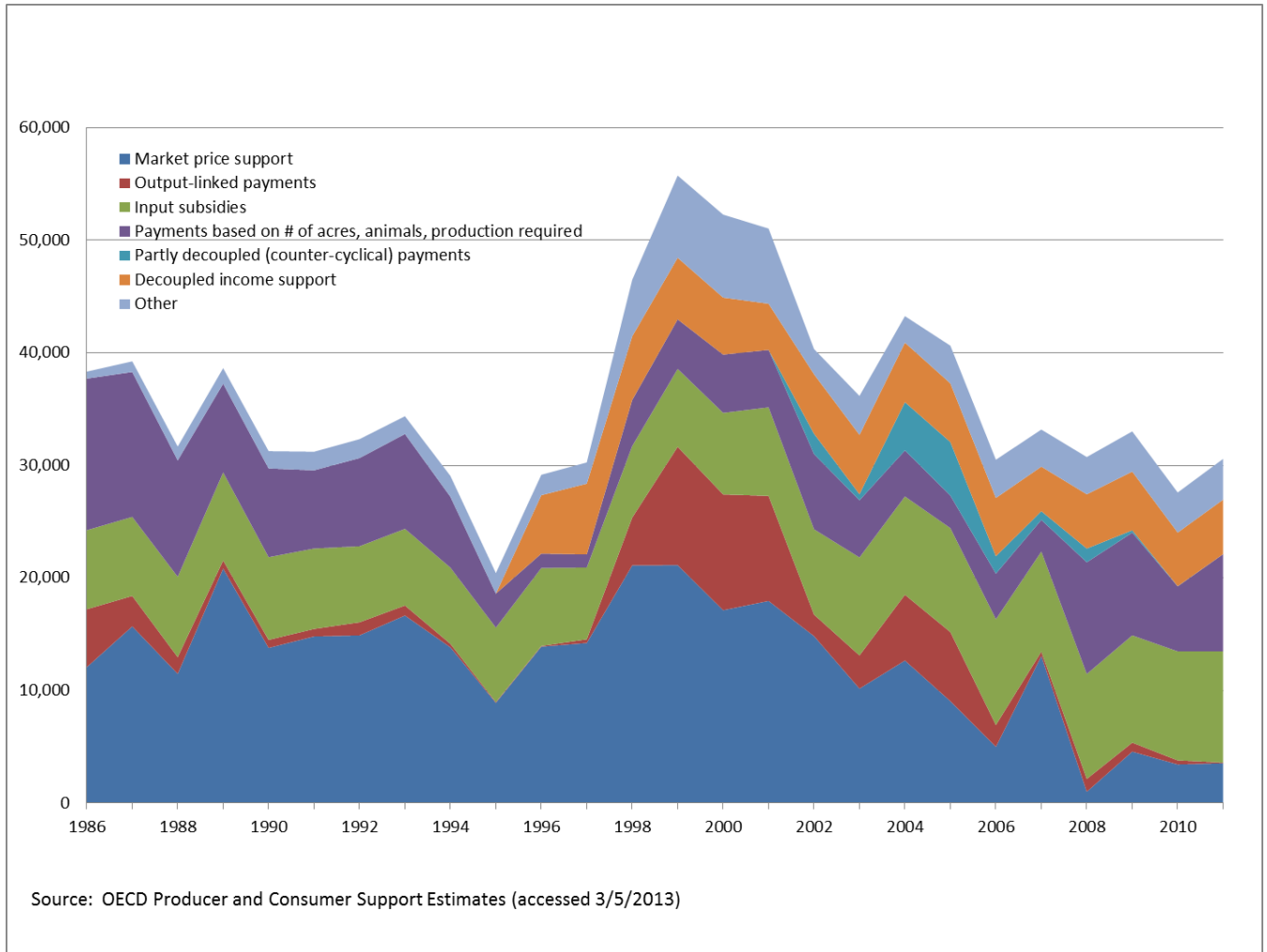


Figure 9: Biofuel Consumption
(millions of gallons)

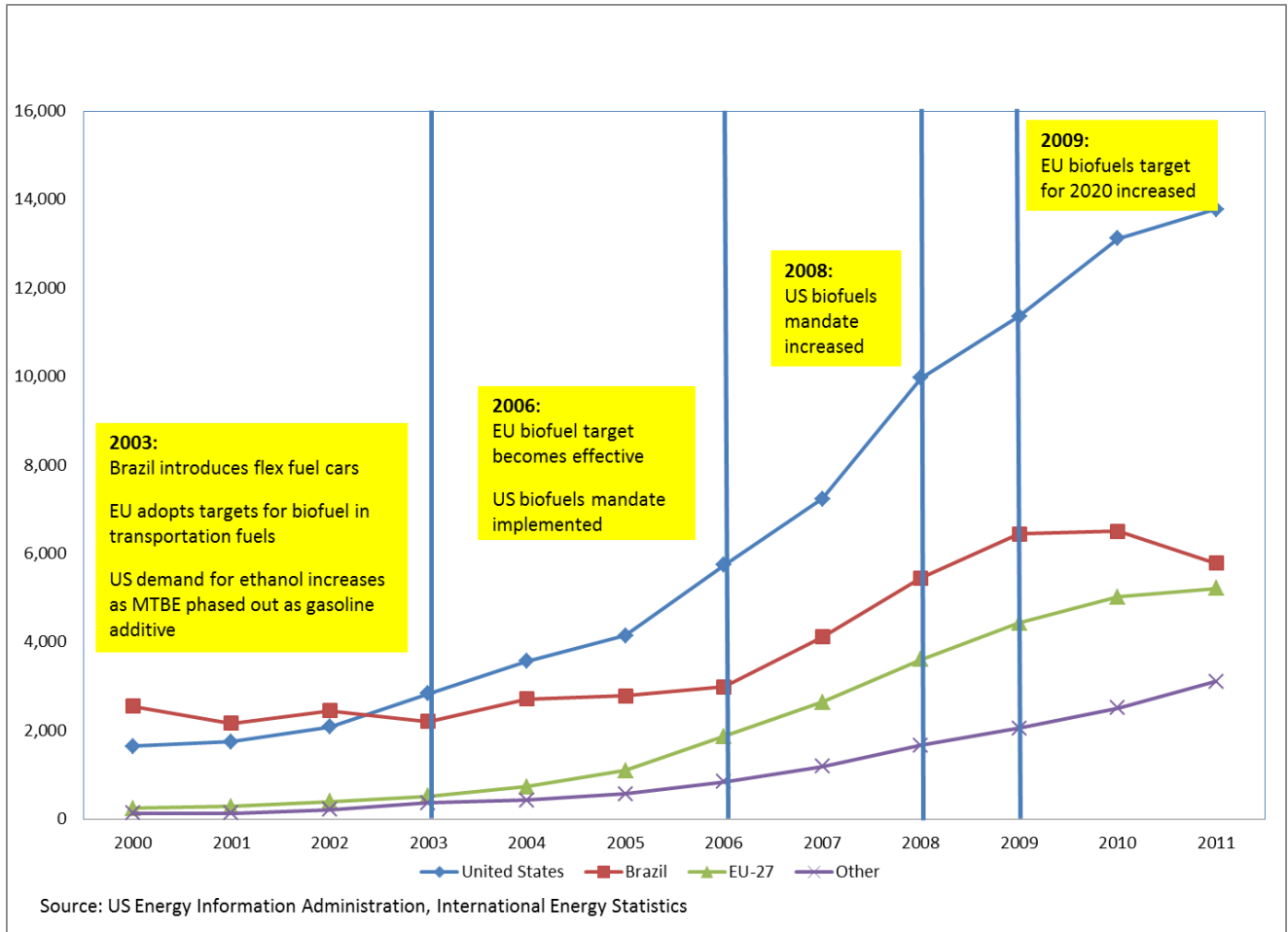
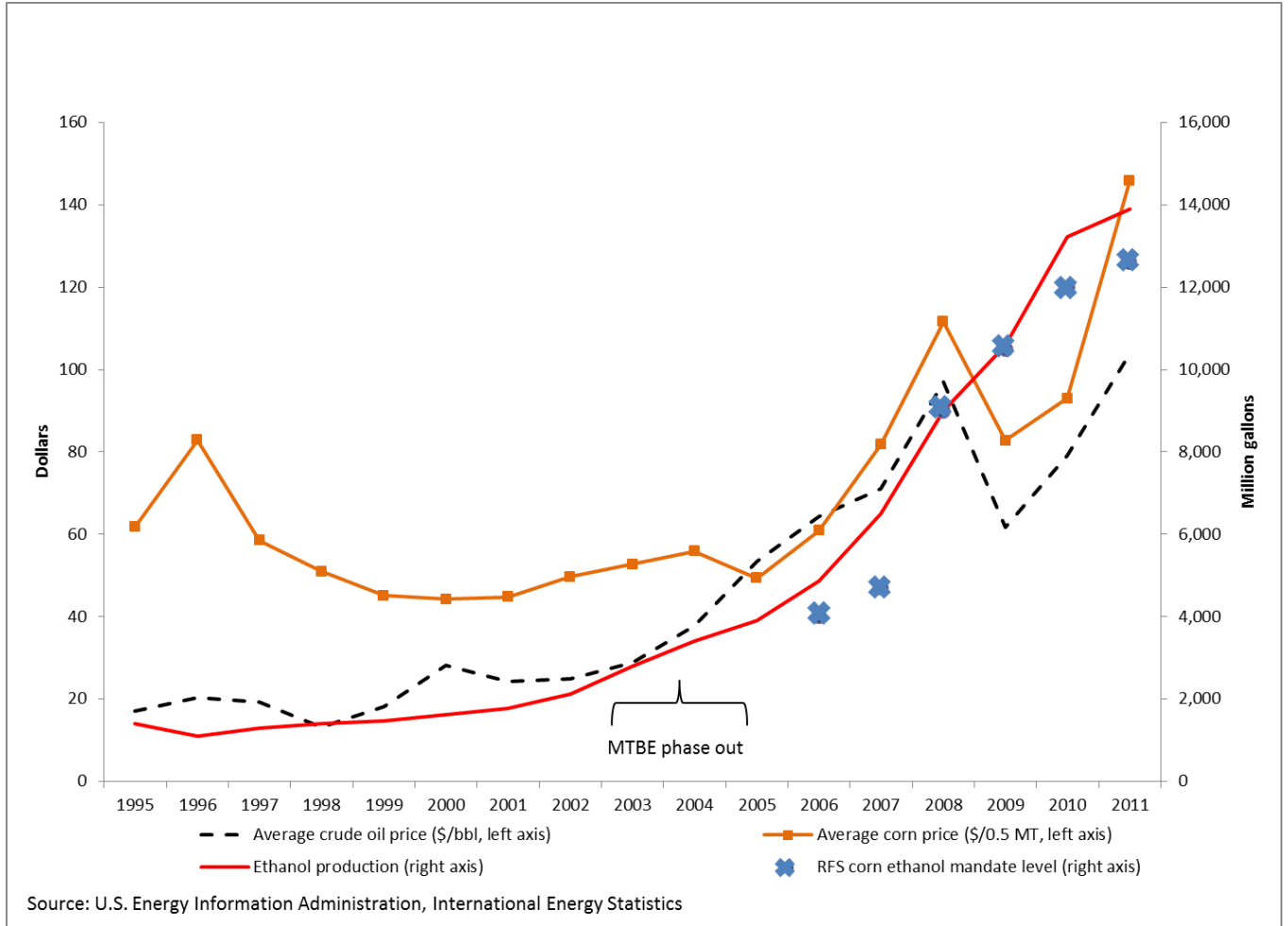


Figure 10: Oil and Corn Prices with US Ethanol Production



Tables

Table 1: Single Commodity Transfers by Country and Commodity, Average 2009-2011
(percent of gross farm receipts)

Commodity	OECD	Canada	EU	Iceland	Japan	Korea	Norway	Switzerland	US
Rice	58		16		71	52			2
Sugar	15		7		54			16	28
Poultry Meat	12	22	29	68	10	46	54	77	1
Beef and Veal	12	2	19	8	33	31	52	44	0
Sheepmeat	11		20	47			27	28	9
Milk	11	52	1	53	54	51	47	26	8
Pigmeat	10	5	2	22	69	64	44	47	0
Other Grains	6	4	0		69	55	46	30	5
Wheat	5	3	0		47		43	22	9
Soyabean	5	1	1		25	86			4
Maize	4	3	0					24	4
Average	14	11	9	40	48	55	45	35	6

NB: blanks indicate no support in that market ever; 0 indicates either minimal or zero currently, but positive support in the past.

Source: OECD Producer and Consumer Support Estimates (accessed on 2/19/2013)

Table 2: Single Commodity Transfers by Country and Commodity*
(percent of gross farm receipts)

Commodity	OECD	Mexico	Turkey	China	Russia
Rice	58	3		-37	
Sugar	15	5	10	39	35
Poultry Meat	12	10	-5	4	43
Beef and Veal	12	9	44	8	29
Sheepmeat	11		10	14	
Milk	11	7	34	11	29
Pigmeat	10	6		14	53
Wheat	5	18	13	24	-13
Soyabean	5	9		13	
Maize	4	8	25	8	-54
Average	14	8	19	10	18

* The figures are three-year averages, 2009-11 for the OECD members and 2008-10 for the others.

NB: blanks indicate no support in that market ever.

Source: OECD Producer and Consumer Support Estimates (accessed on 3/4/2013)

Table 3: Average Cost Reduction from Local Regional Purchase Compared to US-Sourced Food Aid

Commodity	Management Systems Inter ¹	Lentz et al. ²
Unprocessed cereals	35%	53%
Emergency deliveries only	45%	n.a.
To Africa only	42%	n.a.
Milled cereals	18%	n.a.
Pulses	31%	24%
Vegetable oils	-5%	n.a.
Fortified or blended foods (e.g., corn-soy blend)	16	n.a.
Processed foods (including fortified, oils, blends)	n.a.	-8%

n.a. = not available.

1. There were 2 projects in Central America, 2 in Asia, and 13 in Africa.

2. Transactions were examined from 1 country in Central America, 2 in Asia, and 6 in Africa.

Table 4: Reduction in Greenhouse Gas Emissions Relative to Petroleum-based Fuels

Feedstock	Approximate IEA Range (without ILUC) ^a	EU Analysis (without ILUC) ^b		US EPA Analysis with ILUC
		“Typical”	Default	
Waste oil biodiesel	n.a.	88%	83%	86%
Rapeseed biodiesel	10% to 80%	45%	38%	n.a.
Soybean biodiesel	n.a.	40%	31%	57%
Sugarbeet ethanol	30% to 60%	61%	52%	n.a.
Sugarcane ethanol	70% to > 100%	71%	71%	61%
Corn ethanol	-20% to 60%	56%	49%	21%

ILUC = indirect land use change.

a. Based on review of 60 life-cycle analysis studies.

b. Estimates of the typical reduction in GHG emissions relative to petroleum-based on fuels, based on a literature review, are discounted to get the default value for determining each fuel type’s eligibility under the EU mandate. Fuels above the mandate’s threshold value of 35 percent are eligible; for those below the threshold, producers must submit data showing that their process results in GHG emission savings above 35 percent.

Sources: International Energy Agency (2011), p. 16; Flach et al. (2011, p. 8); Yacobucci and Bracmort (2010, p. 18).