Domestic Policies in a Globalized World: What You Do is What I Get.

Consequences of biofuel mandates for global price stability.

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Unilateral trade policies are not the only policies affecting global price stability. Non-trade policies implemented unilaterally by large countries and/or by a large number of small countries at the same time can have destabilizing effects. Until recently, most of the focus has been put on farm subsidies implemented by developed countries to support their own farmers. Such policies have contributed to maintaining low agricultural prices on world markets, creating artificial comparative advantages for developed country farmers, and exporting domestic price volatility to global markets. Starting with the Uruguay Round, international trade negotiations have aimed to bring more discipline to these practices; this trend will hopefully continue[1] through the Doha Round and also through unilateral reform (e.g. the European Union Common Agricultural Policy reform). However, new wide-scale domestic policies are now affecting agricultural markers. The most recent example is the race for biofuel production and the role of first generation crop-based fuel: ethanol and biodiesel.

During the last decade, biofuels production has drastically increased: fuel ethanol consumption has multiplied by five and biodiesel by nearly 20. By 2020, more than 110 million tons of oil equivalent will be produced from first generation biofuels, mainly using crops for feedstocks. Biofuel policies have severely impacted both grains and vegetal oil markets, which are key staple food products. These policies' overall effects are complex, in particular when we incorporate the role of co-products since they impact both the food and feed markets. At the same time, their environmental benefits are disputable (Al Riffai, Dimaranan, and Laborde 2010a; Laborde 2011)[2]. These policies' cost in terms of

[1] Incidentally, it also implies that the reduction of farm support by OECD economies contributes to limiting global supply and increasing global agricultural prices. If this movement should lead to new investments in developing countries and to a boost in agricultural production in the medium-term, the transition period will need to be managed carefully for net food buyers (countries and households) who will suffer from the price increase.

subsidies for taxpayers and/or their incremental burden on food consumers, per ton of CO2 saved, is quite large or even prohibitive for some feedstocks without a large discounting period for Indirect Land Use Effects. In other words, expected emissions reductions linked to biofuels will be lower than initially expected and will be paid for by an increased food bill for the whole world, with larger consequences for the poorest populations for which food expenditures represent the largest part of incomes.

Pro-biofuels policies have two important features: they are mandatory (or strongly subsidized to reach a policy-driven target) and they are affecting the world's most important economies. The US and the EU are leading the charge, and other countries, from India (with a 20 percent biofuel target by 2020) to smaller developing countries such as Peru, are trying to imitate them. This has led to several adverse consequences. At the global level, the strong direct effect will result in an additional demand for crops of an important magnitude (half of the yearly increase in grains is now driven by biofuels). In nearly every country, in order to overcome the price disadvantage of biofuels, their consumption has been made mandatory: a target share, or level, of blending with fossil fuels is defined by legislation. Except a few cases in which very high oil prices provide natural incentives to use more biofuels than the legal requirement, this implies a totally inelastic demand: higher agricultural prices have no impact on the demand for feedstock by the biofuel sector.The agricultural markets are structurally inelastic: increasing production needs time (R&D), while resources (land, water, nutrients) are limited and people still need to eat on a daily basis. Inelastic systems are characterized by large price fluctuations that quantity cannot adjust easily. Bringing a growing inelastic component to the demand side will make the market even more rigid and exacerbate price fluctuations; thus, these policies magnify price volatility. Since the more elastic component of the system is food and feed demand, and since biofuel producers benefit from large subsidies/tax credits in many countries, the cost of such fluctuations is then mainly paid by consumers (household and livestock producers). Growing demand for biofuels has also deeply affected international trade patterns with, for instance, the EU's shift from net rapeseed oil exporter to net rapeseed importer.

In addition to these consequences, an important indirect effect is also occurring. The incremental demand for crops for use as biofuels is taking place during an already tense period (2004–2010) in which booming demand in Asia due to accelerated growth, associated with negative climatic events and some unilateral policy reforms (such as decoupled EU agricultural policy), has weakened the world food supply and boosted food and feed demand. In this context, biofuels have played a very important role in lowering world reserves. Since low world reserves boost speculative (private agent) and panic (public government) behavior, this leads to amplified food price volatility.

Last but not least, biofuels gradually increase the link between energy markets (which are highly volatile) and food markets (also volatile), further increasing the volatility of the latter. Traditionally, these markets have been linked through the agricultural supply channel (in terms of the energy demand

for farms, such as electricity for irrigation and fertilizers); now a new channel appears on the demand side when mandates are not binding.

Quantifying the effects of biofuel on effective prices is much more challenging, and the literature presents scarce evidence. On one hand, the overall magnitude of the biofuel program remains limited (less than 3 percent of world cropland) and cannot explain large shifts in price trends (Al Riffai, Dimaranan, and Laborde, 2010b). Of course, the situation varies for different feedstocks impacted by these programs. For instance, the wheat market is poorly affected by ethanol demand (less than 2 percent) compared with corn (15 percent of world production processed into ethanol). The situation is tenser for vegetable oil, where biodiesel is already absorbing 16 percent of world production of cumulated rapeseed, soybean, sunflower, and palm oil. For rapeseed oil, slightly less than 30 percent of world supply is already processed into biodiesel. Simulation models – looking at long-term equilibrium – consider that biofuels increase world prices by less than 2 percent for wheat, about 4–15 percent for corn, and 15–40 percent for vegetable oils. Overall, the effects on food prices faced by average consumers remain low (less than 1 percent). However, the specific role of biofuels in price hikes is even more challenging to attribute. It takes place during a conjunction of events in which multiplicative effects occur—a perfect storm. Biofuels may only contribute to a 5 percent price increase for cereals, but when they are combined with a negative climatic shock on yield (supply decrease), in which the fast-growing additional demand has not been fully included in farmers' expectations or/and biofuels have contributed to depleting inventories, their role is magnified. The latter effects are important and should be kept in mind: looking at the demand changes between 2001 and 2010, biofuel demand has represented 70 percent of the incremental demand for all uses for corn, 13 percent for wheat, 90 percent for rapeseed, 47 for soybean oil, and 22 percent for palm oil. Biofuels have played a critical role in sustaining a fast-growing demand for several crops and therefore have contributed to an exacerbation of price tension in the short run and a reduction in the level of inventories.

Conclusions

In the medium run, biofuel policies will increase food prices in limited proportions at a national level, with some products and some categories of consumers, especially the poorest, being potentially more strongly affected. However, by shifting the demand for agricultural commodities upward, biofuels can also contribute to enhancing research and development in the agricultural sector and will boost long-term productivity, benefiting all consumers.

In the short run, these rigid policies, by their nature, contribute significantly to price volatility and are potentially more toxic than traditional farm support or decoupled programs.

A critical issue is the role of quantitative constraint, the mandate that makes biofuels demand totally inelastic. It is critical to know whether or not these mandates will remain binding in the future. This will depend on the evolution of the relative prices of biofuels, agricultural feedstocks, and fossil fuel, as well

as the capacity of demand to go beyond the blending wall. Of course, due to additional distortions related to subsidies, including tax credits, the binding nature of these mandates is endogenous to other measures.

Since biofuel policies are part of a rich political agenda (which includes environmental goals, national energy security, and farm support), it will be difficult to achieve a deep revision of such policies and the removal of distortive instruments.

At the same time, most existing international disciplines, in particular at the WTO, have been designed to fight policies that create negative externalities on world prices (such as crop subsidies). In the context of a distortive policy that raises prices, existing mechanisms appear to have limited capacity to correct such externalities.

Recommendations

Even if, for political reasons, it will be quite difficult to implement, it should be clear that policymakers should tackle the problem of fossil fuel consumption by taxing these fuels to reduce their negative externalities (CO2 emissions, current account impacts, and energy dependency) rather than by supporting biofuels, whose merits and flaws remain uncertain.

In this context, we should promote home-based reforms that will make existing policies more flexible and help to reduce the volatility of agricultural prices:

1. **International trade of biofuels and feedstocks has to be liberalized** to allow access to deeper markets and eliminate the pressures on specific domestic commodities.

2. **Optimally, all distortive policies**, **especially mandates**, **should be removed** to avoid policy-driven conflicts between food and non-food use of natural resources and agricultural commodities.

3. In a political economy context where removing all support will be difficult, biofuel policies and consumption targets have to become flexible. **The mandate level should be revised to adapt to the situation in world food markets and to be negatively correlated with observed gaps between supply and demand**. The first challenge is to define this optimal level of consumption. To put it differently, this will involve fixing a new level of mandates every time agricultural market conditions evolve, as well as being able to determine the right amount of grains/oilseeds to add or remove from the markets. It must also be taken into consideration that an optimal consumption may be zero during some periods. The simplest system, based on the information available, is to link the level of mandates for the next period (duration to be defined) to the

current, or short-term forecasted, level of available inventories. Indeed, as discussed in the first section, the destabilizing role of biofuels in recent years may have been a key contribution in the marginal demand and may have played a part in depleting inventories, especially during episodes when food/feed demand exceeded supply. Low levels of inventories will force biofuel consumption to be reduced, while high levels will increase the agricultural feedstock consumption for non-food use. This implies the need for reliable information regarding inventories; the exact link between available stocks and biofuel demand will need to be studied (proportional or non-linear rule) carefully, including the role of private agent expectations (including, but limited to, the biofuel sector), storage behaviour, and international coordination (item 7). Having a transparent rule is critical to avoid discretionary changes that will create noise for private agent expectations and also favour predatory behaviours from lobbies.

4. **If policymakers want to maintain support for biofuel producers, it has to be done through price incentives instead of quantitative constraints** and favouring policies that still carry the price signals. This system will be more flexible and more transparent. It will show the direct cost of such policies. It is important to underline the fact that in the context of reducing fiscal deficits in many OECD countries, policymakers will be inclined to support domestic biofuels production through mandates (cost for the consumers) or tariffs (government revenue) instead of subsidies, even if the latter have better properties. Such reforms should be avoided, in particular in a context in which elimination of subsidies will make binding mandates that would not be otherwise.
   Interestingly, we may want to emphasize the parallel with WTO agricultural negotiations during the Uruguay Round, even though the whole issue may be more sensitive. To reach a global agreement and avoid non-cooperative policies, promoting a three-step approach makes sense:
   i. "Tariffication" of existing quantitative policies that will be replaced by specific or ad valorem subsidies (see item 5);
   ii. “Binding” of such tools;
   iii. Phasing out with a schedule to reduce distortions over time and to promote the apparition of next generation biofuels.

   Discussion of the equivalent “green box” for biofuel producers (see item 6) as well as special and differentiate treatment for developing countries could be implemented in such a framework.

5. Facing existing, or new (item i) subsidy schemes and assuming them to be exogenous, changes in the prices of agricultural inputs, ceteris paribus, will still reduce biofuel use when prices go up and help to mitigate initial tensions. However, assuming that agricultural prices react (partial positive correlation) to oil prices through the input costs side of the channel, then the biofuel/fossil fuel trade-off (demand channel) will also reinforce the correlation and increase agricultural price fluctuation. In this case, which is the most probable scenario, we need to add

an endogenous policy tool to change the intensity of the correlation between the two markets to limit importing volatility from oil markets to agricultural ones. **This tool will be the endogenisation of the biofuel subsidy** that can be defined by feedstock to take into account different market features among coarse grains, wheat, or oilseeds. In a period of excess volatility[3] imported from the oil markets, the subsidy will be adapted in a linear or non-linear way in conditions that remain to be defined. Interestingly, the use of a *specific* (e.g. USD per gallon, EUR per ton) subsidy, instead of ad valorem one, will help to stabilize the markets. Indeed, the incentives of the subsidy will become less important when prices go up (less incentive to use agricultural feedstocks to produce biofuels) and the reverse when prices decline.

6. **These reforms (item 1 to 5) will help stabilize prices, but will bring more risk for the biofuel industry** since its level of operation (utilization rate of capital and labor) may vary significantly from one year to another. This can limit the extension of the industry due to its initial high fixed costs. For countries that want to promote biofuels, these costs should be covered by the government; this would be more transparent than shifting the burden to domestic and foreign food consumers. Countries may also be asked to opt for flexible processing pathways. Existing sugar mills that produce ethanol and/or sugar depending on the relative prices provide a good illustration of a flexible technological pathway.
   The capacity of private suppliers to invest in a sector in which demand is largely policy-driven and subject to large fluctuations can be strongly limited. Risk-averse private investors will avoid such opportunities, and strong investment incentives may be needed to develop and maintain biofuel production capacity, leading to a potentially very costly policy; however, a lump sum (decoupled payment to effective production) approach may be favoured and a contract menu between biofuel producers and governments can be written, still respecting participation and incentive contracts.

7. **Any modification of the level of mandates or subsidies will require important international policy coordination and harmonization.** Otherwise, we will see significant costs due to global externalities. If a large country decreases its mandate, it will stabilize for other countries that may want to continue to produce and/or consume biofuels. Similarly, if an importing country maintains a high mandate when a producing/exporting country uses price mechanisms to curb demand, the overall effect will be totally inefficient. It will be primordial for the global

[3] See http://www.foodsecurityportal.org/policy-analysis-tools/wheat-prices-and-returns for a discussion on how to detect excess volatility episod.

community to define which forum (e.g. G20) should be devoted to this coordination, learning from the success and difficulties of the WTO to address similar problems of coordination.

8. **Lastly, adaptative biofuel policies will set the stage for a transition from first generation to second / third generation biofuels** when the long-term trend, by 2050, of growing population and income and increasing climate change will deteriorate the structural balance between supply and demand. First generation biofuels have to be clearly seen as a short-term solution that can use excess supply farm capacity (keeping in mind that the agricultural markets today are in a much more optimistic situation than most of the projections for 2050; see Laborde and al. 2011). However, development of second generation biofuels using perennial plants grown on cropland will not improve the situation.

References

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