Removing Biofuel Support Policies: An Assessment of Projected Impacts on Global Agricultural Markets using the AGLINK-COSIMO model

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Summary

1. This paper sets out the projected impacts of removing global support policies to the biofuel sector in the OECD-FAO Aglink-Cosimo model. As such, the note attempts to assess the likely impact of global biofuel support policies on international agricultural commodity markets in the medium-term.

2. Removal of EU biofuel support is projected to lead a large fall of around 80% in EU bioethanol production and a smaller decrease of approximately 20% in EU biodiesel production relative to the baseline scenario in which EU support to the biofuel sector is maintained.

3. The reduction in EU biofuel production has a modest but significant price impact on the feedstocks used for biofuel production in the EU with the largest impact on EU vegetable oil prices. Furthermore, overall EU production of biofuel feedstocks does not change significantly relative to the baseline even though EU consumption of biofuel feedstocks is much lower. Consequently, EU exports of biofuel feedstocks – particularly wheat - increase significantly on baseline levels.

4. Removal of US biofuel support is projected to result in a reduction in US bioethanol production of approximately 90% as compared to the baseline scenario in which US biofuel support is maintained. The driver of this fall occurs through the reduction in the quantitative mandate for US bioethanol production rather than through the abolition of the subsidy to bioethanol blenders and/or the removal of the US tariff on imported bioethanol.

5. Reduced US bioethanol production as compared to the baseline scenario has a large projected impact (downward) on US maize prices and accordingly, given the US export share in the global coarse grain market, on world coarse grain prices. However, both US maize area and production decline significantly as compared to the baseline scenario in response to lower US bioethanol output and lower US maize prices.

Introduction

6. The OECD-FAO Aglink-Cosimo model was used to simulate the removal of global biofuel support policies in both the USA and the EU. Aglink-Cosimo is a dynamic partial-equilibrium model of the global agricultural sector which currently projects from 2011 to 2020. Aglink-Cosimo contains advanced biofuel modules for both the US and the EU.

7. The baseline scenario referred to hereafter is the 2011-2020 Aglink-Cosimo projection contained within the 2011 OECD-FAO Agricultural Outlook. Biofuel support policies are included in this baseline projection.

8. Simulations were run in which EU biofuel policies and USA biofuel policies were abolished in separate scenarios. The results of these simulations where then compared to the baseline scenario.

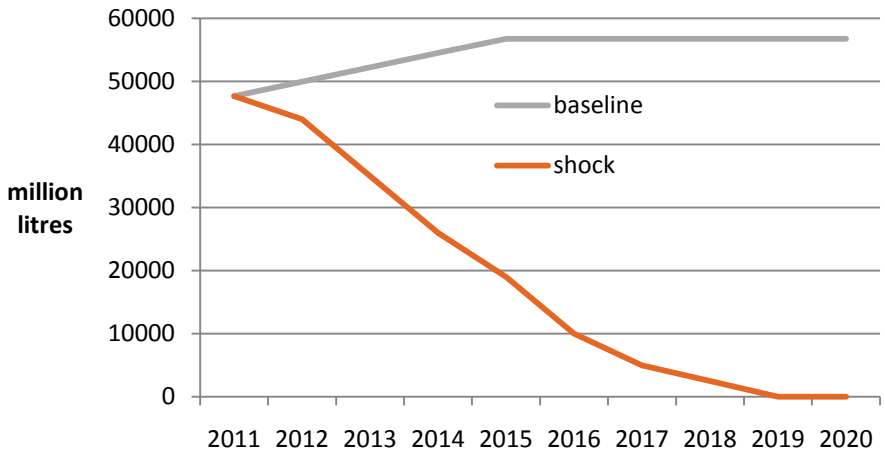
9. Specifically, In the EU, the following policies were removed:
    - Tariffs on imported biodiesel and bioethanol in the EU from 2011 onward.
    - Tax incentives provided on biodiesel and bioethanol in the EU from 2011 onward.

10. Blending obligations in the EU are no longer modelled explicitly in Aglink-Cosimo (beginning in the 2011 version).

11. In the USA, the following policies were removed :
    - Bioethanol tax credits and tariffs on imported bioethanol from 2011 onward.
    - The quantitative mandate for bioethanol production from corn (maize) in the USA – a component of the "Renewable Fuel Standard" (RFS).

12. Importantly, it was not possible to remove the RFS mandate in the model from one year to the next. Given the size of the US corn-ethanol sector, the model does not solve for such a large step change. Therefore, the RFS mandate was phased-out over the period 2011-2018 as shown by the "shock" line in Figure 1.

Figure 1: phase-out of corn-ethanol supported by RFS

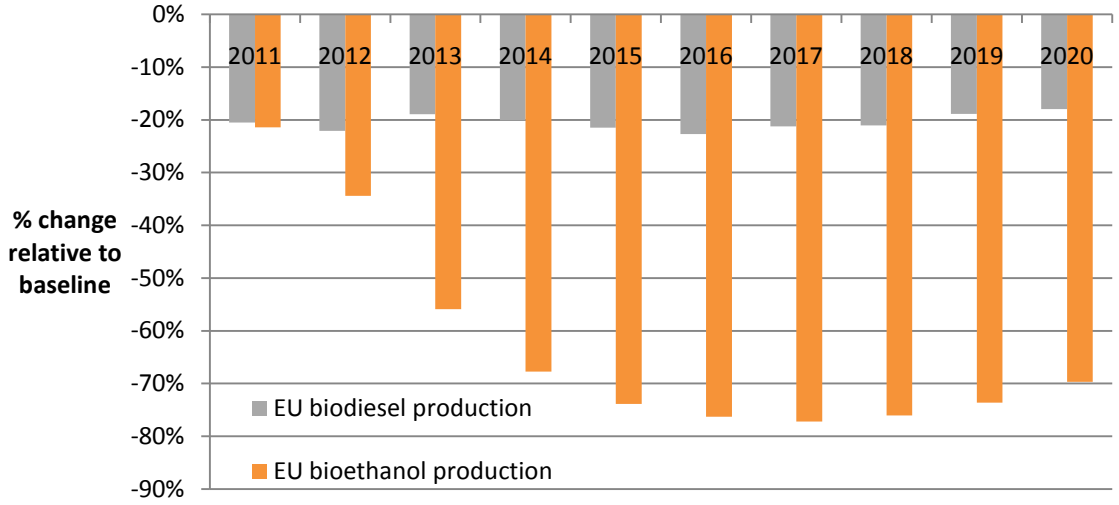


Results

Removal of EU biofuel support

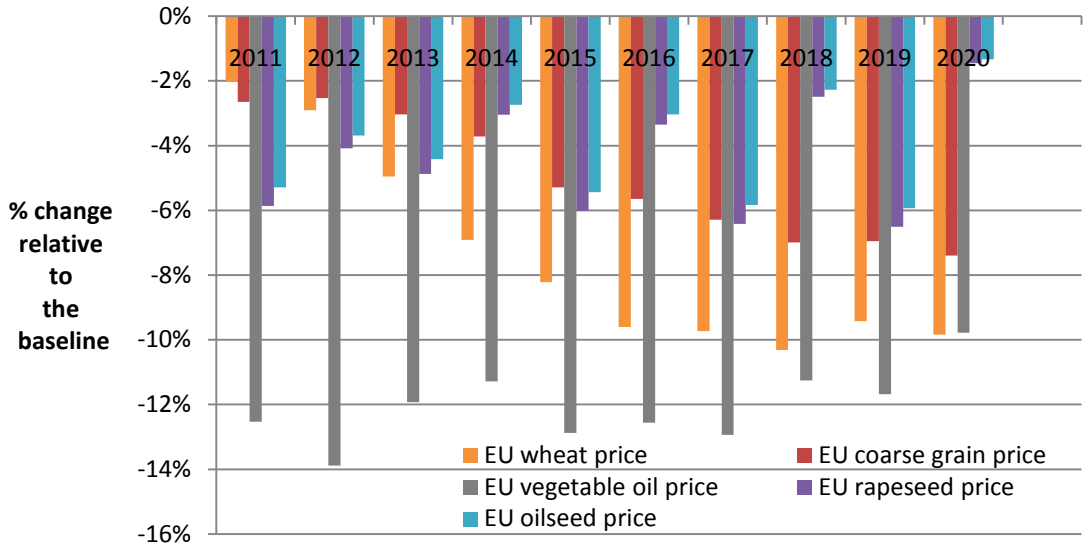
13. The projected impacts of removing EU biofuel support are larger on bio-ethanol output than on bio-diesel output. EU biodiesel production is around 20% below the baseline level over much of the projection period whereas EU bioethanol production drops by nearly 80% relative to the baseline (see figure 2).

figure 2. projected impacts of removing biofuel support on EU biofuel production



14. The largest projected impacts on feedstock markets occur in the vegetable oil and wheat markets (figure 3). Despite larger impacts in the bioethanol market than in the biodiesel market, vegetable oil prices are more affected than wheat prices; this is because the share of vegetable oil production used for biodiesel is greater than the share of wheat production used for bioethanol.

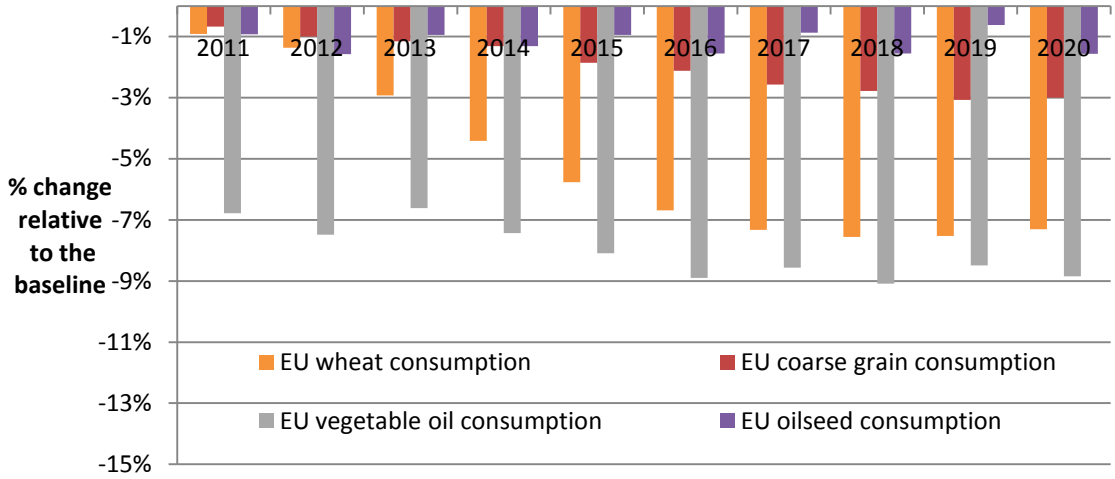
figure 3. projected price impacts of removing EU biofuel support



15. On average over the projection period, projected wheat prices are around 7% lower in the scenario where EU biofuel support is removed than in the baseline scenario. Similarly, vegetable oil prices are, on average, around 12% lower and oilseed prices are approximately 4% lower than baseline levels over the projection period.

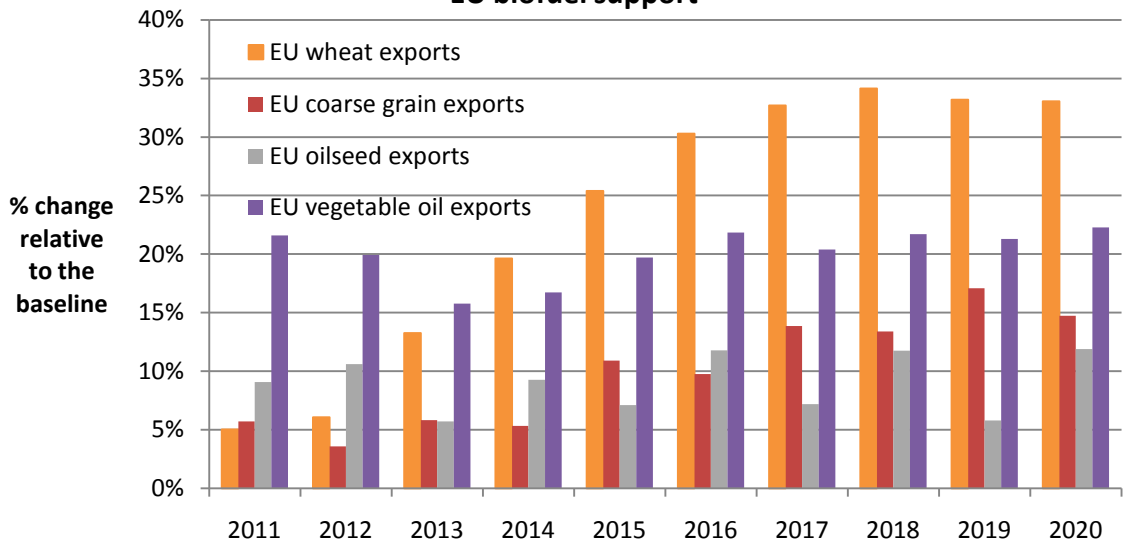
16. The modest price changes projected are the consequence of a reduction in EU consumption following the removal of biofuel support. The projected changes in consumption are shown in figure 4.

figure 4. projected impacts on consumption of removing EU biofuel support



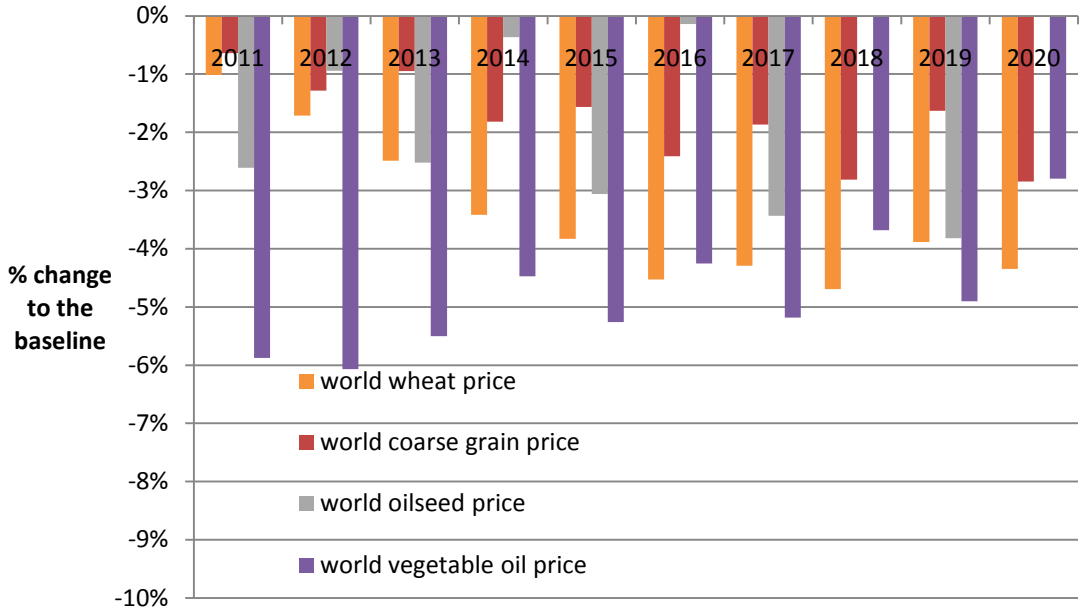
17. Relative to baseline levels, there are negligible changes in production, area harvested and yields of the major biofuel feedstocks. The drop in domestic consumption of feedstocks leads to higher exports of biofuel feedstocks from the EU to global markets than in the baseline scenario. Over the projection period, wheat and vegetable oil exports see the largest projected increase relative to baseline levels of around 33% and 20% respectively (see figure 5).

figure 5. projected impacts on EU agricultural exports of removing EU biofuel support



18. As a consequence of increased EU feedstock exports, there are relatively small decreases in the world prices of these feedstocks relative to the baseline over the projection period. On average, projected world wheat prices are around 3% below; coarse grain and oilseed prices around 2% below and vegetable oil prices around 5% below the baseline over the projection period (figure 6).

figure 6. projected impacts on global agricultural prices of removing EU biofuel support

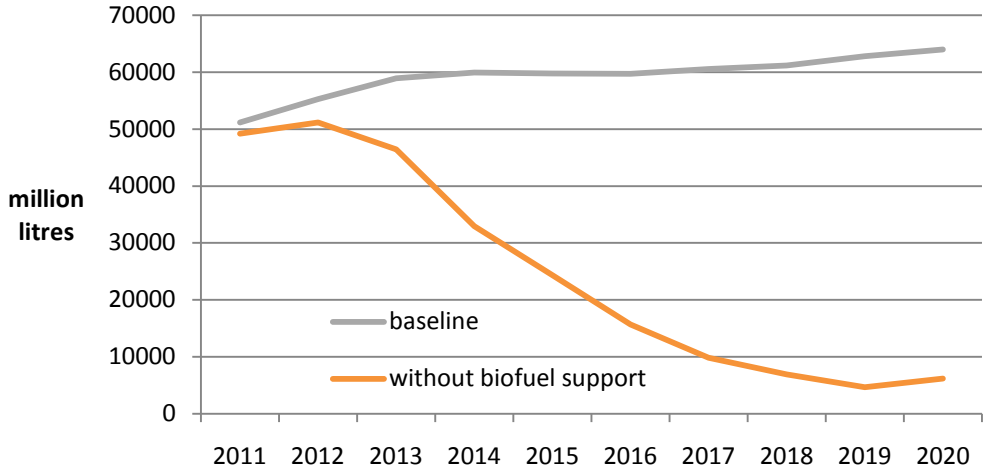


Removal of US biofuel support

19. The projected impacts of removing US biofuel support are larger than removing EU biofuel support. This is mainly because bioethanol is mostly produced from one feedstock in the US (corn (maize)) rather than from a more diversified feedstock base as in the EU and secondly, due to the USA's large export share in global agricultural markets (particularly in corn (maize)), any impacts on US domestic farm prices are also partially transferred to global markets.

20. US bioethanol production drops markedly over the projection period in response to the removal of US biofuel support (figure 7). By 2020, US bioethanol production is 90% lower than in the baseline scenario, despite improving economic viability of corn-bioethanol production over the period. It is important to note that this reduction in bioethanol production is driven almost **solely by the reduction in the RFS mandate** and not by either the elimination of the tax credit to bioethanol blenders or the removal of tariffs on imported bioethanol[2].

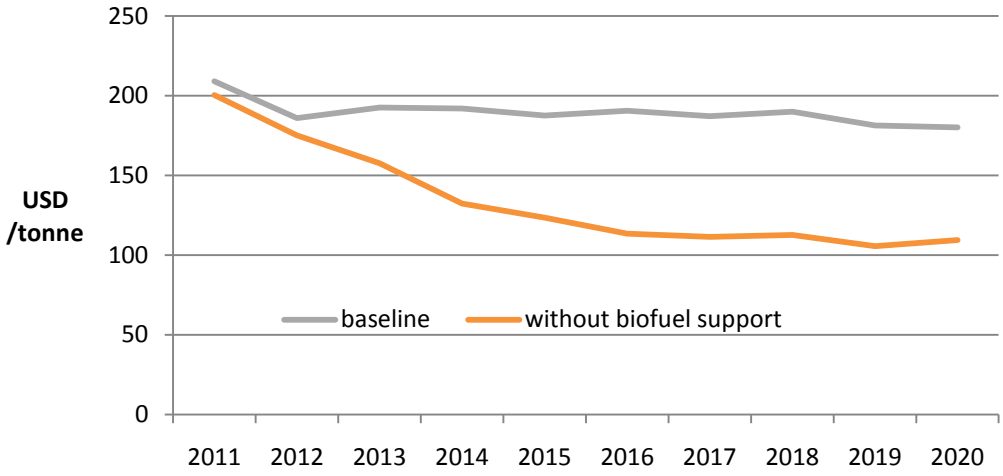
figure 7. projected USA ethanol production



21. The reduction in bioethanol production reduces the consumption of corn (maize) and therefore leads to a decrease in US corn (maize) prices over the projection period (figure 8). The US is, by far, the world's largest producer and exporter of corn and as such, effectively sets the world price of corn (maize) on the world market.

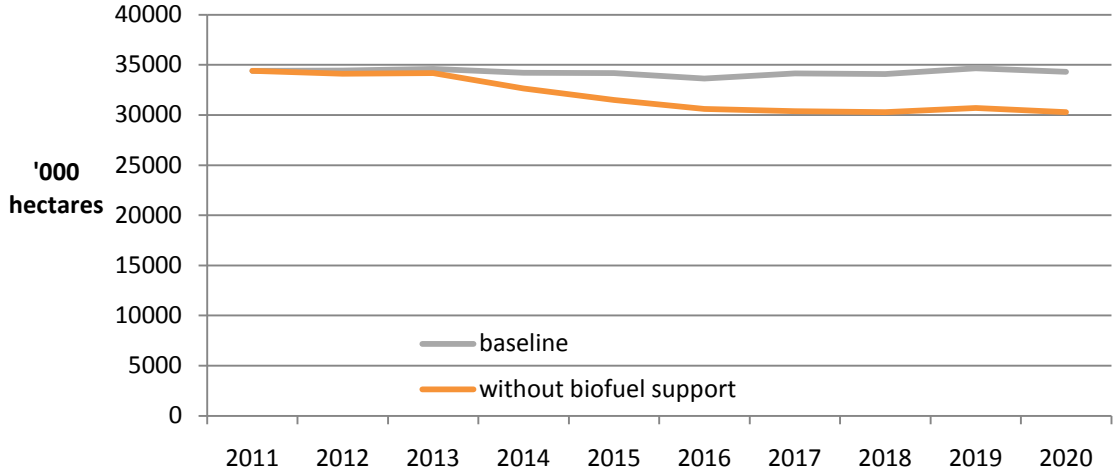
[2] A scenario was run in which the tax credit and the import tariff were eliminated, but the RFS mandate maintained. In such a scenario, there was little overall change in US bioethanol production over the projection period; suggesting that the RFS mandate drives bioethanol production rather than the fiscal biofuel support tools.

figure 8. projected US corn (maize) price



22. Lower US corn (maize) prices over the projection period act to reduce US corn (maize) area as the economic returns to corn (maize) production are now lower than in the baseline scenario. By 2020, the projected US corn (maize) area is 12% below the baseline level and accordingly projected US corn (maize) production is 14% below the baseline level (figure 9).

figure 9. projected US corn (maize) area



23. Soybeans are a close substitute for corn (maize) on the supply-side of the US market and in the model US soybean area expands as relative price incentives shift away from corn. As a consequence, the projected US soybean area is 11% above the baseline level by 2020 and US soybean prices are around 7% lower than in the baseline scenario.

24. The large export share of the US in global agricultural trade transmits projected price impacts from the US domestic market to the global market. Relative to the baseline scenario, world coarse grain prices are projected to fall by between 12% and 14% by 2020, in response to the removal of US biofuel support. World

oilseed prices are projected 6% below baseline levels over the projection period whilst world wheat prices are around 5% below the baseline level on average over the projection period (figure 10).

figure 10. projected impacts of removing US biofuel support on global agricultural markets