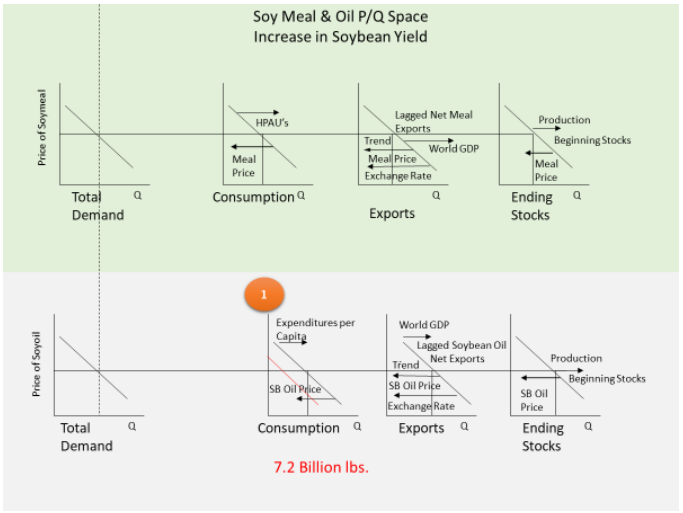
NBB Static Biodiesel Shock

Question Asked: What is the impact of removing the biodiesel-based soyoil demand on the USDA marketing year cash soybean price using a STATIC near-term model.

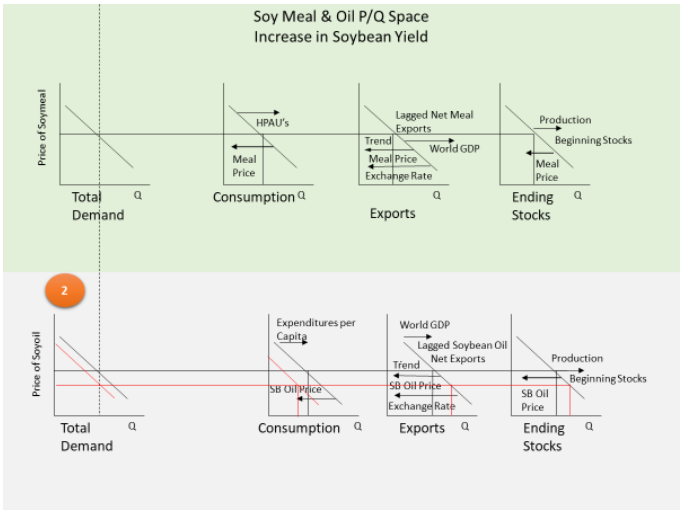
STATIC Near-Term Model: Static refers to a single commodity space. So in this model, we run a price shock through the soybean PQ space and output a new price. We would then plug the output of this soybean model into all of the other commodity models if this was a dynamic model, rather than a static model. The output of those models would then get plugged back into this soybean model. That process would continue until supply=demand & a new cash price is produced for each impacted commodity.

PQ Space: This is a Price vs Quantity relationship. Running a regression mathematically shows the relationship between the different variables within the PQ Space. We can then change one of these variables and it will output a new price representative of these changed relationships.

PQ Space 1 (Initial Soybean Oil Shock): This shock starts with soybean oil consumption. WASDE defines soybean oil consumption in two categories 1) biodiesel demand and 2) food, feed & other. Biodiesel makes up a little more than 1/3 of domestic soyoil consumption. The economics would fail to support the production of biodiesel if the biodiesel mandate is eliminated, removing much of the 8.6 billion pounds of soyoil used in its production. Lower demand leads to lower prices & lower prices would incentivize greater feed & food demand. It is difficult to model this relationship without having models built for canola oil, cottonseed oil, corn oil, & heating oil. Feed and food consumption is held constant in this static model, decreasing domestic consumption by the biodiesel demand.



PQ Space 2 (Calculating the Final Demand Shift): When domestic consumption is decreased, price is expected to fall. Falling prices incentivize an increase in global demand increasing exports. Depending on the prices of other suppliers, mainly Brazil and Argentina, exports will vary. The difference between the decrease in consumption and the increase in exports will get added to ending stocks. The equilibrium between these different variables will then output the crush demand that comes from soybean oil. Our model shows that crush demand for soyoil fell 21% after removing the EPA biodiesel mandate.



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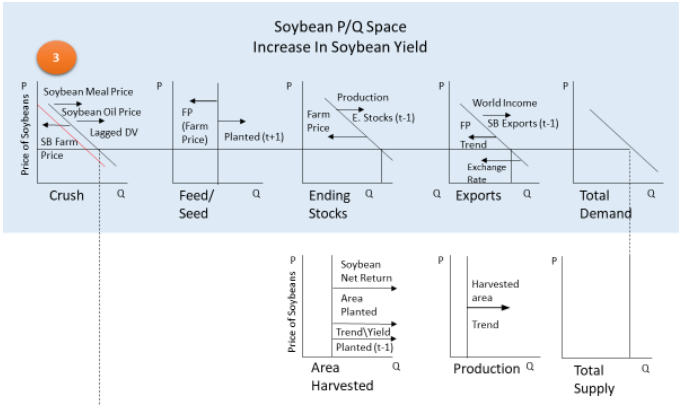
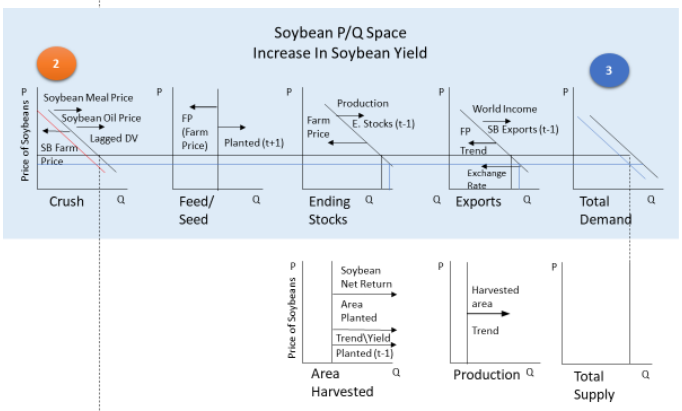
Soybean crushing produces both soymeal & soyoil. Soybean oil prices fall as demand decreases until either processors crush less, or the soybean oil price drops low enough to incentivize an increase in global demand. Export demand growth is limited by the number of substitute products on the market. PQ Space 2 increased soybean oil exports to their limit bound by the historical relationships within the model. The 21% decrease in soyoil crush demand then gets implemented into the soybean PQ space since you cannot have meal without oil. In this study we held supply constant since supply mostly changes based on lagged variables excluding production.



PQ Space 3 (Closing Identity): We ran three different soybean yield scenarios (47.9, 40 & 44 bushels per acre) to get a baseline of where prices would be prior to the removal of the biodiesel mandate. Prices fell while ending stocks and exports increased after introducing the demand shock to the PQ space. Soybean demand fell 11%. The most intriguing part of this study is how the shock affected each scenario differently. The price impact of removing the biodiesel mandate increased as the yield dropped and ending stocks tightened. Using the current USDA yield, our model outputs an average farm cash price of *$8.83*. Prices fell ***13%*** to *$7.68* after removing the mandate. The lower yield scenarios resulted in tighter stocks and price decreases of 22% or more. We ran multiple scenarios due to the uncertainty of this year's crop. The tighter the balance sheet, the greater the shock.



We are able to concentrate on the impact of removing the biodiesel mandate by holding supply constant rather than inputting what we estimate yield to be or where we estimate planted acres. If this was a dynamic model, we would plug in the marketing year average cash soybean price that this model outputs into other commodity models. All of these markets are tied together. When soybean prices fall, it forces substitute product prices to fall as well in order to be competitive. If substitute goods prices are too high, then that will increase the demand for soybeans. Furthermore, the output of this model would also feed into livestock models, which would fundamentally consume higher quantities as feed prices decline, resulting in an increased demand for all feed products. The markets always have their way of working things out in order to move prices back to a trend level that is close to the cost of production. The price shocks seen above are an immediate market reaction to the removal of the biodiesel mandate. A dynamic model would minimize this price change as lower prices are seen by the demand side. However, it gives a great representation of how prices can change immediately following a significant policy change when these other models are not included.

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