

Revisions in the USDA Baseline Projections

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USDA’s long-term agricultural baseline projections are fixed-horizon, 10-year path projections that provide dynamic information along their path, and are of vital importance to farmers, market participants, and policymakers. The USDA agricultural baseline report is released in February each year (USDA ERS, 2020). Compared with the fixed-event agricultural forecasts, such as the World Agricultural Supply and Demand Estimates (WASDE), the USDA agricultural baseline projections focus on capturing major factors that influence future trends in agricultural production, markets, and farm income rather than on transient shocks. This makes agricultural baselines the basis for many agricultural and financial long-term policies. The commodity baseline projections are used to forecast farm program costs and to prepare the President’s budget (USDA ERS, 2020). Also, the baseline projections, which are based on specific assumptions for the macroeconomy, policy, and weather, enable the comparison between alternative policies.

RECENT REVISIONS

The farm price baseline projections reported in the recent three years for two major commodities, corn and soybeans, reflect the long-term effect of macroeconomic factors on the agricultural sector.

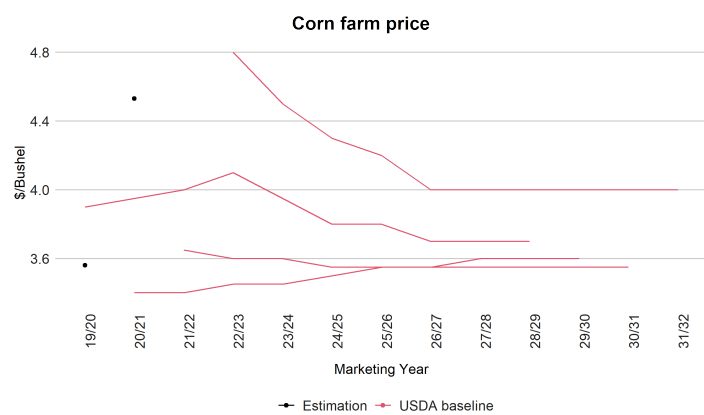


Figure 1: Corn price: actual values and USDA baseline projections, 2019-2021

As Figure 1 depicts, the corn price projections decrease by 14% from \$3.95 per bushel projected corn price for 2020/21 which was reported in 2019 to \$3.40 per bushel which was reported in 2020; decrease by 15% from \$4.00 per bushel for 2021/22 reported in 2019 to \$3.40 per bushel reported in 2020; decrease by 16% from \$4.10 per bushel for 2022/23 reported

in 2019 to \$3.45 per bushel reported in 2020; and decrease by 13% from \$3.95 per bushel for 2023/24 reported in 2019 to \$3.45 per bushel reported in 2020. For the following five marketing years, from 2024/25 to 2028/29, corn price projections decrease by 9%, 7%, 4%, 3% and 3% respectively in the baseline report published in 2020 compared with the report published in 2019. For the report published in 2021, the corn price projections slightly increase by 7% from \$3.40 per bushel for 2021/22 reported in 2020 to \$3.65 per bushel; increase by 4% from \$3.45 per bushel for 2022/23 and 2023/24 reported in 2020 to \$3.60 per bushel; increase by only 1% from \$3.50 per bushel for 2024/25 reported in 2020 to \$3.55 per bushel.

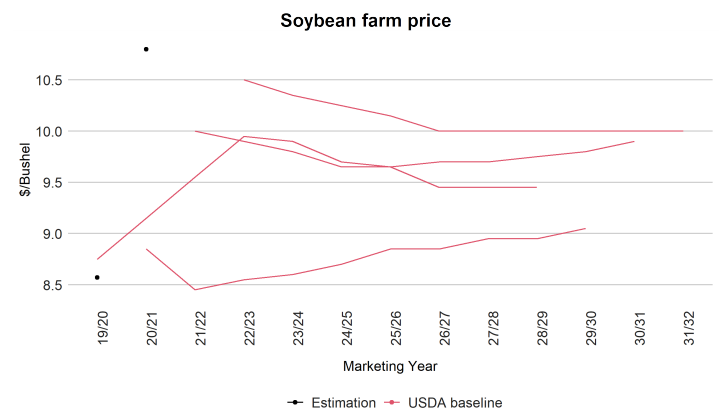


Figure 2: Soybean price: actual values and USDA baseline projections, 2019-2021

For the following five marketing years, from 2025/26 to 2029/30, the corn price projections stabilize to values smaller than the values reported in 2020. For the latest report published in February 2022, corn price projections further increase significantly, especially for the first five marketing years from 2022/23 to 2026/27. Generally, the revisions of the corn price baseline projections made in 2020 reveal a strong negative market sentiment toward the agricultural commodity price, especially for the nearby five future marketing years. Though remaining well below its pre-covid level, the sharp decline in the baseline projections of corn price in the near future is alleviated by the revisions presented in the 2021 baseline report following a surge in the corn price by 21% from \$3.56 to \$4.3 per bushel.

As Figure 2 depicts, soybean price projections show a similar pattern for the revisions presented in 2020 baseline report, while there is a rally in the 2021 baseline report following a surge in the soybean price by 30% from \$8.57 to \$11.15 per bushel. It shows an optimistic attitude toward US long-term

exports of soybeans, coupled with production shortfalls in major growing regions outside the US. The increasing trend continues in the latest report published in February 2022. For corn yield, the baseline projections remain the same for the recent three years from 2019 to 2021 with a slight decline in 2022. For soybean yield, the baseline projections show a constant decrease of 0.05 bushels per harvested acre in the 2020 report and another additional decrease of 0.45 bushels per harvested acre in the 2021 report.

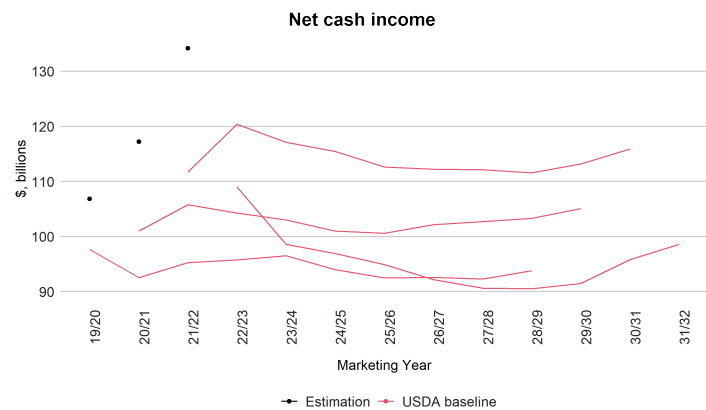


Figure 3: Farm income: actual values and USDA baseline projections, 2019-2021

As Figure 3 depicts, path projections of net cash income are boosted up consecutively mostly by the negative revisions of cash expenses projections, positive revisions of government payments for 2020/21 to 2026/27 reported in 2020, and positive revisions of farm-related income for 2023/24 to 30/31 reported in 2021 which is triggered by the increase in inflation rate.

REVISIONS IN USDA BASELINE PROJECTIONS

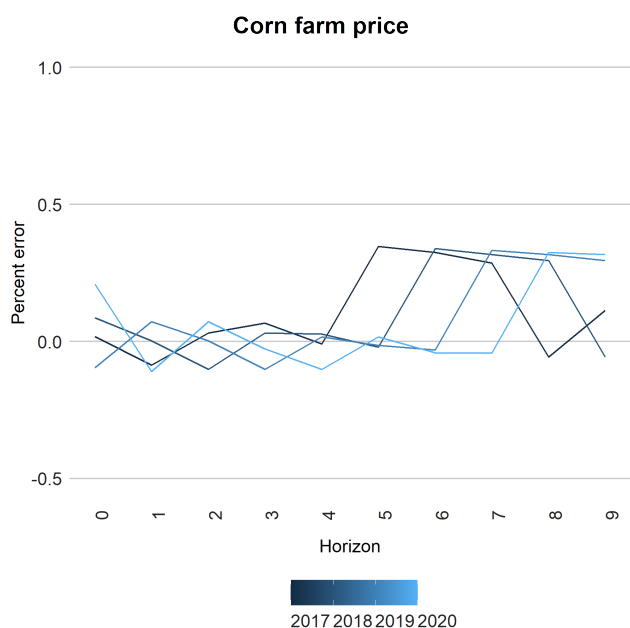


Figure 4: Corn price baseline projections revisions, 2017-2020 Each line represents the revisions made in previous 10 horizons (years) for one year. For example, the line representing 2017 projections made in 2017 as horizon 0 and in 2008 as horizon 9.

Despite the policy relevance and importance of the USDA baseline projections, their evaluation has drawn limited attention. Bora, Katchova, and Kuethe (2021) empirically show that the predictive content of the baselines projections for most variables diminishes after 4 to 5 years.

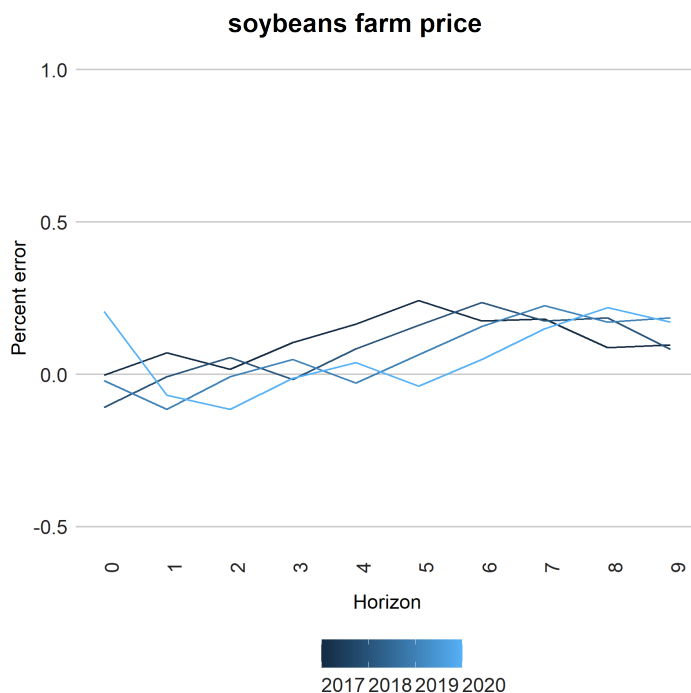


Figure 5: Soybean price baseline projections revisions, 2017-2020 Same as Figure 4.

New information is incorporated annually into the baseline projections by providing revisions to the 10-year agricultural baselines. However, we show evidence that the revisions from one year to the next do not necessarily improve the accuracy of the projections over the horizons.

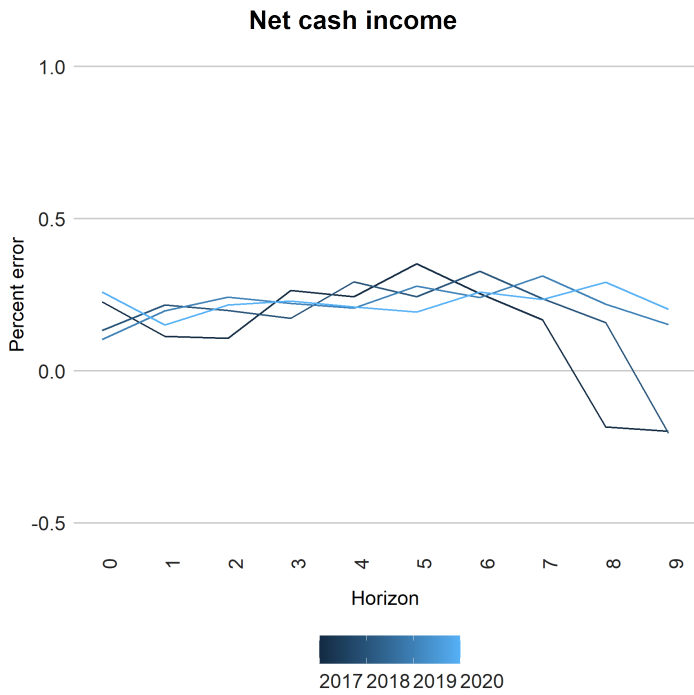


Figure 6: Net cash income: actual values and USDA baseline projections, 2017-2020

Same as Figure 4.

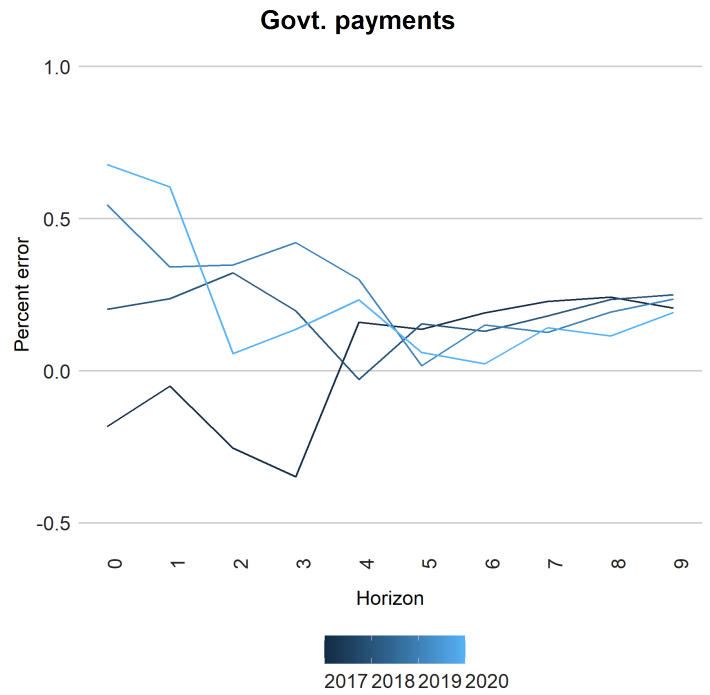


Figure 7: Government payments: actual values and USDA baseline projections, 2017-2020

Same as Figure 4.

CONCLUSIONS

Our findings of how USDA projections are revised from one year to the next are consistent with a smoothing behavior that is associated with the smoothed assumptions for the long-term factors. An alternative explanation, as suggested by Coibion and Gorodnichenko (2015), is information rigidity, which can be mitigated by constructing a more advanced system of information management.

As Figure 4 depicts, corn price baseline projections have a percent error that is significantly declining over the horizons only for 2017, while the percent error has an upward trend over horizons for 2019 and 2020. As Figure 5 depicts, soybean price baseline projections have a percent error that is significantly declining over the horizons only for 2018. For net cash income, which is depicted in Figure 6, its percent error has a downward trend over the horizons only for 2018 and 2019. For government payments, depicted in Figure 7, their percent error has an upward trend over the horizons for all years from 2017 to 2020.

REFERENCE

USDA ERS. 2020. USDA ERS, Agricultural Baseline, Questions Answers. Accessed on April 1, 2021.

Bora, S.S., A.L. Katchova, and T.H. Kuethe. 2021. "The Accuracy and Informativeness of Agricultural Baselines." Working Paper, Ohio State University and Purdue University.

Coibion, Olivier and Yuriy Gorodnichenko. 2015. "Information Rigidity and the Expectations Formation Process: A Simple Framework and New Facts". The American Economic Review 105.8, pp. 2644–2678.



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