Impact of China's Retaliatory Tariffs on Democratic Vote Share Between 2016 and 2018

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Motivation:

On July 6, 2018, President Trump's administration imposed tariffs on $34 billion worth of Chinese goods, including televisions, aircraft parts, and medical devices. These tariffs were met by swift retaliation from China as they decided to impose tariffs on agricultural products form the United States. This decision from China had a negative impact on agricultural producers of the United States - especially on the soybean producers, among which support for Trump and the Republican Party tended to be high.

Research Question:

Following China's retaliatory tariffs before the midterm election, were soybean producing counties more likely to see shifts in the vote share toward Democratic candidates?

Method:

- Factors that contribute to the reduction or growth in Change in Democratic Vote Share from 2016 to 2018 is estimated using Ordinary Least Square (OLS) regression.

- Dependent variable is Change in Democratic Vote Share from 2016 to 2018.

- Independent variables include:

  1. Percent change in Soybean production from 2018 to 2019

  2. Percent change in Corn production from 2018 to 2019

  3. Median Household Income in 2018

  4. Unemployment Rate in 2018

  5. Acres of Soybean planted in 2018

  6. Change in Republican Vote Share from 2008 and 2010

Data Sources:

- Data collected are county level.

- Corn and Soybean production and acres planted data comes from United States Department of Agriculture (USDA).

- Election data for House of Representative comes from Secretary of State website from each state secretary's website.

- Our Median Household Income and Unemployment rate data comes from American Community Survey (ACS) and Bureau of Labor Statistics (BLS).
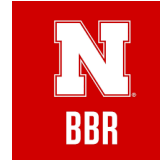
Model:

$ChangeInDemVoteShare = \alpha + \beta_0 ChangeInSoyProd + \beta_1 ChangeInCornProd + \beta_2 MedianHHIncome + \beta_3 UnempRate + \beta_4 AcresOfSoyPlanted$

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where,

α = intercept

$ChangeInDemVoteShare$ = Change in Democratic Vote Share from 2016 to 2018

$\beta_0 ChangeInSoyProd$ = Percent change in Soybean production from 2018 to 2019

$\beta_1 ChangeInCornProd$ = Percent change in Corn production from 2018 to 2019

$\beta_2 MedianHHIncome$ = Median Household Income in 2018

$\beta_3 UnempRate$ = Unemployment Rate in 2018

$\beta_4 AcresOfSoyPlanted$ = Acres of Soybean planted in 2018

$\beta_5 ChangeInRepVoteShare$ = Change in Republican Vote Share from 2008 to 2010

Results:

Change in Soybean Production and Change in Democratic Vote Share

	DV: Change in Democratic Vote Share between 2016 and 2018	
	ChDemShare16to18	
	(1)	(2)
Percent change in Soybean production (2018-2019)	-0.082***	-0.062**
	(0.027)	(0.026)
Percent change in Corn production (2018-2019)	0.037***	0.033***
	(0.012)	(0.012)
Median Household Income (2018)	0.005	0.009**
	(0.004)	(0.004)
Unemployment Rate (2018)	0.002	0.001
	(0.002)	(0.002)
Acres of Soybean planted (2018)	0.005***	0.004***
	(0.001)	(0.001)
Change in Republican Vote Share (2008-2010)		-0.136***
		(0.037)
Constant	-0.026	-0.023
	(0.031)	(0.031)
Observations	683	662
R^2	0.073	0.078
Adjusted R^2	0.067	0.070
Residual Std. Error	0.125 (df = 677)	0.120 (df = 655)
F Statistic	10.732*** (df = 5; 677)	9.296*** (df = 6; 655)
Significance levels		*$p<0.1$; **$p<0.05$; ***$p<0.01$

Predicting Change in Democratic Vote Share from 2016 to 2018:

States	Counties	% Change in Soybean Production from 2018 to 2019	Predicted Change in Democratic Vote Share from 2016 to 2018
Nebraska	Kearney	-0.1602248	0.0623738
Illinois	Knox	-0.1084864	0.0679989
Iowa	Butler	-0.1388097	0.0689763
Kansas	Montgomery	-0.1203095	0.0388978
Minnesota	Dodge	-0.1562562	0.0632419
Ohio	Morgan	0.0891089	-0.0028649
Oklahoma	McClain	-0.4848485	0.0710017
Wisconsin	Fond Du Lac	-0.2004678	0.0614260
Indiana	Huntington	-0.1749453	0.0612443

Counties on the table were chosen at random.

- Plugging in a negative value for Changes in Soybean production into the equation below shows a positive association with Change in Democratic Vote Share from 2016 to 2018.

- This means a decrease in Soybean production from 2018 to 2019 is associated with an increase in Democratic voting.

$ChangeInDemVoteShare = -0.026 - 0.082 ChangeInSoyProd + 0.037 ChangeInCornProd + 0.005 MedianHHIncome + 0.002 UnempRate + 0.005 AcresOfSoyPlanted$

Limitations:

1. USDA has not reported soybean and corn production data for many counties in 2018 and 2019 which limits the number of observations in the regression model.

   - A follow-up analysis shows that there are no systematic differences between counties with and without missing data.

2. The difference in voter turnout between presidential and midterm elections is not accounted for in the model.

3. Model contains data for 42/50 states, but includes all major soybean producing states.

Conclusion:

1. Changes in Soybean production from 2018 to 2019 had an effect on the Change in Democratic vote share from 2016 to 2018. A decrease in Soybean production from 2018 to 2019 is associated with an increase in Democratic vote share.

2. This effect is slightly reduced when historical voting patterns are controlled for. Historical voting patterns, the control variable, is accounted for by Change in Republican Vote Share from 2008 to 2010 in the model.

3. Likewise, when controlling for historical voting patterns, the median household income was able to explain some of the variance in the dependent variable.

4. Lastly, the model is able to explain very little about the variance in change in Democratic Vote Share from 2016 to 2018 since the R^2 is very low.

Acknowledgements: