Purchasing Policy: The Effect of Political Action Committee Campaign Contributions from the Agribusiness Sector on Support Mechanisms for Individual Crop and Product Producers

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***Abstract*— In this paper, I analyze data on agricultural producer support mechanisms and agribusiness Political Action Committee campaign contributions from 1998 to 2016 to determine the extent to which lobbying on behalf of any particular crop or agricultural product is translated into government transfers back to its producers. I proceed with a review of the existing literature about purchasing support mechanisms and the agriculture industry, and a discussion of the data, which is sourced from USDA, OECD, and The Center for Responsive Politics. Guided by Hausman test results, I run a fixed effects regression to demonstrate that campaign contributions do not have a statistically significant impact on transfers to producers in the agribusiness industry, despite findings in the literature.**

I. Introduction

It is common discourse within the field of economics to emphasize the deadweight loss to society as a result of lobbying, campaign contributions and the protectionist measures these actions seek to encourage. Considering a scenario without market failures such as externalities and asymmetric information, the general social welfare is mathematically higher in the absence of tariffs, quotas, and producer subsidies, which are often applied to uniform products that can be easily substituted by imports. In recent years, there has been much discussion about the impact of campaign contributions, and the need for campaign finance restrictions and policy reformations, due to the unfair outcomes they presumably create. There is an implicit assumption that the economic distortion of price and market supports is a result of campaign finance from the private sector, and that donations to political campaigns are directly reflected in the passage of donors preferred policies.

This topic is of particular importance in the agriculture industry, which maintains a historical legacy of support and a persistent anti-trade bias (Anderson, Rausser, and Swinnen, 2013). In 2016 alone the agribusiness sector spent over $26.4 million on campaign contributions to federal candidates in 2016, a slight rise from the $25.6 million spent in the 2014 congressional election cycle. (The Center for Responsive Politics, 2017) In fact, political action committee contributions to federal candidates have been increasing steadily since 1998, at a rate of $1-3 million each election cycle. These contributions are seemingly not without purpose; there are extensive agricultural supports in the United States. With a $13 billion estimate of total producer single commodity transfers from consumers and taxpayers to agricultural producers in 2016, it seems that the enormous campaign contribution expenditures are reflected in the policies chosen by the legislative officials whom they finance (OECD, 2017). However, the total support received by single commodity producers has actually declined from the $20.3 billion of transfers in 2014. In fact, this number has fluctuated considerably since 1998, ranging from $7.7 billion to $27.4 billion (USDA, 2017). This lack of consistent trend begs the question: do agribusiness campaign contributions directly translate into producer supports for donors?

It is worth noting that these transfers are not received uniformly by agricultural product producers and the agribusiness sector does not lobby as a single entity, indifferent with regard to which particular producers receive support mechanisms. From 1998 to 2016, approximately 275 political action committees made congressional campaign contributions in each 2-year period. Of the nearly 3000 PACs, more than half of them are product-specific, meaning that they contribute on behalf of a particular crop or set of crops (e.g. wheat, or eggs and poultry). As mentioned, these contributions are made with the assumption that they will "purchase policy"—industry support for a candidate begets reciprocal support via subsidies quid pro quo.

However, to what extent is the lobbying on behalf of any given crop reflected in the transfers to its producers? Are agribusiness contributions aggregated mentally and reflected in the presence of a general farm bill, which is approved every 5 years, with insignificant distinctions between the extent of producer support mechanisms with respect to individual crops? Or are campaign contributions a primary determinant of the quantity of transfers to specific crop producers? This paper will provide insight into the significance of both general and crop-specific campaign contributions in policy production. More specifically, this study will test the hypotheses that either crop-specific contributions, as a percentage of the production value of the particular crop, and/or total yearly contributions from the agribusiness sector determine producer support mechanisms, controlling for social welfare of the policy (the extent to which the policy hurts consumers of that product).

This paper uses data which range over 14 crops and 18 years, from 1998-2016. This research is particularly

relevant at present; there is a lack of research on agricultural campaign contributions impact on policy over the last twenty years, during which there has been a changing climate of agricultural protection. In 1995, the implementation of the WTOs Uruguay Round Agriculture Agreement began, and developed countries incorporated new restrictions into their policies over a six-year period (World Trade Organization, 2001). One particular facet of this goal was increasing agricultural market access and reducing market price distortions created by high tariffs, export subsidies, and domestic transfers to producers (World Trade Organization, 2001). Domestic support programs were classified into groups, including "amber-," "green-," and "blue-" box-policies. The first category includes domestic policies that have direct effects on production and trade and therefore must be cut back. The second category includes policies that have "minimal impact on trade" and can therefore be used without restriction. These include "government services such as research, disease control, infrastructure and food security" (World Trade Organization, 2001). Of particular interest is the inclusion of direct payments to farmers that "do not stimulate production, such as certain forms of direct income support" (World Trade Organization, 2001). In light of this deal, agricultural producer support is declining, and the implementation of support policies is shifting.

Therefore, the weight of campaign contributions in determining the allocation of withstanding funds for transfers to producers has emerged as a more salient issue for agribusiness PACs nationally, and in determining what incentives must be adjusted in order to make future market access negotiations successful. If global negotiations have only marginally decreased barriers and contributed significantly to furthering inequality among domestic producers, these are valuable observations in evaluating the efficacy of the policies. Further, billions of taxpayer dollars are used to bolster agricultural producers; the impact of lobbying, in comparison to social welfare metrics, in shaping their distribution is crucial in assessing the value of support mechanisms in helping United States citizens as a whole.

In this paper, I analyze data on agricultural producer support mechanisms and agribusiness Political Action Committee campaign contributions from 1998 to 2016 to determine the extent to which lobbying on behalf of any particular crop or agricultural product is translated into government transfers back to its producers. I proceed with a review of the existing literature about purchasing support mechanisms and the agriculture industry, and a discussion of the data, which is sourced from USDA, OECD, and The Center for Responsive Politics. Guided by Hausman test results, I run a fixed effects regression to demonstrate that campaign contributions do not have a statistically significant impact on transfers to producers in the agribusiness industry, despite findings in the literature.

II. Literature Review

The majority of the studies regarding campaign contributions and their abilities to "purchase" policy are based on the Grossman-Helpman model of "Protection for Sale" (Grossman and Helpman, 1992). In 1992, Grossman and Helpman modeled special interest groups impact on policy, using n lobbies and a single policymaker (the federal government). The concept captured by the G-H model is that the special interest groups within an industry are a collection of various profit maximizers who intend to maximize rents, represented by government transfers from protectionist policies net of campaign contributions that motivate the creation of such policies (Grossman and Helpman, 1992). Politicians who create this policy are maximizing their own welfare functions—weighted sums of PAC contributions and social welfare, which push in opposite trade-policy directions. In the Grossman Helpman model, PACs present a menu of auctions or a contribution schedule, with options for a series of policies and the contributions the PAC will make given those policies (Grossman and Helpman, 1992).

The Grossman-Helpman Model also emphasizes import elasticities and import penetration ratio[1] as measures of the deadweight loss generated by producer support in each industry. When the import elasticity is high, the deadweight loss from protection will be higher so the government will be more reluctant to impose protectionist policies. Similarly, when there is low import volume, consumers do not oppose import restrictions as strongly, and producers do not lobby for them as extensively (Grossman and Helpman, 1992).

In their 1997 paper "Protection for Sale: An Empirical Investigation," Pinelopi Koujianou Goldberg and Giovanni Maggi find empirical evidence for the Grossman Helpman model, using data on nontariff barrier coverage ratios in 1983 (Goldberg and Maggi, 1997).[2] They complicate the model with a finding that the governments welfare function puts a much larger weight on social impact of the policy than it does on contributions. They find that differences in protection can be entirely explained by the degree of political organization within an industry (there is a PAC representing the industrys interests), campaign contributions, import elasticity, and import penetration ratio (Goldberg and Maggi, 1997). However, Goldberg and Maggi do not incorporate a campaign contributions variable directly into their regression, and instead estimate a constant that represents the weight of campaign contributions, relative to social welfare, on policy. They also test factors like employment size, sectorial unemployment rate, measures of unionization, and buyer and seller concentration, and find that none of these variables have explanatory power (Goldberg and Maggi, 1997).

In a study similar to that of Goldberg and Maggi (1997), Kishore Gawande and Usree Bandyopadhyay (2000) analyze the same 1983 nontariff barrier data and confirm the finding that campaign contributions are highly correlated with protectionist measures. They add that a dummy variable

[1]The import penetration ratio is defined as the ratio between the import value to the value of total domestic demand for the product, showing the degree to which demand is satisfied by imports (OECD 2017).

[2]The nontariff barrier coverage ratio is a metric that represents the share of a countrys imports "this is subject to a particular non tariff barrier, or any one of a specified group of non tariff barriers," for example, subsidies, or delays due to customs processing (OECD 2001).

for "the industry is politically organized" and a variable for the "quantity or concentration of similar lobbies" have statistically significant correlations with support mechanisms. Gawande and Bandyopadhyay focus on the impact of downstream industries and their counter-lobbying, but again they do not incorporate a direct campaign contributions variable. Further, the assumption that downstream industries would lobby against support is theoretically consistent when support comes by way of tariffs or quotas, which raise the price paid for the input. However, policy instrumentation has largely changed since 2000 and support mechanisms are more heavily provided through subsidies and transfers to producers. These policies theoretically lower the prices observed and paid by downstream industries. With regard to agriculture specifically, it is possible that this shift in instrumentation would alter the interests of the processed food industry and other similar agricultural product users in favor of agricultural support mechanisms.

Rigoberto Lopez applies the Grossman-Helpman model to agribusiness in particular and complicates the conversation with his finding that not only would eliminating campaign contributions significantly decrease agricultural subsidies, but that investment returns to farm PAC contributors are about $2,000 in policy transfers for every dollar of contributions (reflective of a range of returns from $14-$16,590 per additional dollar). (Lopez 2001) This points to the idea that contributions may not be analyzed as a quid pro quo exchange but rather have the potential to be amplified dramatically as they are translated into policy regarding producer transfers. This also suggests that contributions may be more significant than the social welfare changes they initiate in the eyes of the legislators creating the policies, as contributions are translated on a one-to-many dollar basis.

In 2005, Gawande added to the discussion about campaign contributions and support mechanisms with his paper "The Structure of Lobbying and Protection in US Agriculture" by running a simple regression between different support mechanism and campaign contributions, the import to output ratio, and the export to output ratio (Gawande, 2005). Unlike Lopez, who sought to analyze the extent of the welfare change initiated by agribusiness campaign contributions, this paper directly applies a rough version of the Grossman-Helpman model to agriculture in order to determine the respective weights of contributions and social welfare in policy makers welfare functions. (Gawande, 2005) In particular, Gawande studies the relationship of campaign contributions with three metrics of support: quality assurance standards, specific tariffs, and countervailing duties. In contrast with the results of Goldberg and Maggi (1997), Gawande finds no association between protectionism and the import penetration or the export-to-output ratio. However, he does find a statistically significant correlation between the contributions and protectionist policy (Gawande, 2005). The methodology of Gawandes 2005 paper is discussed in Section IV to serve as a contrast for the functional form specifications selected in this paper.

I merge the findings and methodologies of the aforementioned studies in order to determine the extent to which crop-specific campaign contributions continue to translate into protectionist policies despite the overall trend away from price distortions in trade. I will include variables to account for the possibility that crop-specific contributions impact support mechanisms for crop producers other than the ones they were contributed on behalf of. I will also include variables for the quantity of PACs contributing on behalf of the particular crop and from the industry, and for a time lag in the impacts of contributions. My methodology combines aspects of the papers of Gawande (2005) (base specification), Goldberg and Maggi (1997), Gawande (2000) (inclusion of industry organization variables) and Lopez (2001) (methods of measuring contributions and support mechanisms) to eliminate omitted variable bias present in each of the studies, and continue evaluating the empirical evidence of the Grossman-Helpman model, specifically with respect to agriculture in the late 20th and early 21st centuries.

III. Data

To complete my analysis, I use data on producer support metrics, available through OECD and USDA databases (the same data sources used by all the peer reviewed papers discussed in Section II). These data include the crop-specific value of production and the PSE, which is a measure of all policy transfers to agricultural producers as a share of gross farm receipts. These data together allow me to compute the % PSE, which represents the nontariff barrier in a way that allows for uniform comparison among crops of different values.[3] This dataset has estimates for Wheat, Barley, Sorghum, Maize, Rice, Soybeans, Sugar, Milk, Beef, Poultry, Eggs, Pig meat, Sheep meat, Wool, and Cotton, and ranges from 1998 to 2016.[4]

On the other side of my analysis, I use data on campaign contributions from OpenSecrets (The Center for Responsive Politics), which is also the data source of the papers discussed above. The contributions are listed by sector; I exclusively used data for PACs categorized as "Agribusiness Sector PACs." The database then records the contributions by PAC, so I have looked up each individual PAC and searched their sites for keywords representing each of the agricultural products listed above.[5] Each contribution is thereby attributed to a single or set of products and assumed that it was donated with the goal of protectionist policies for that

[3]The reasoning behind the use of nontariff barrier data is discussed in the Methodology section.

[4]The dataset also includes observations for wool, however the PSE data included four extreme outliers (40-80 times larger than the mean), and thus it was removed from the set.

[5]Many PACs made crop specific contributions on behalf of fruits and nuts. Due to the lacking availability of protectionist estimates for these two products, these contributions were removed from the dataset, along with the fewer than 100 combined contributions on behalf of flowers, horses, and trees/forestry. PSE data included estimates for alfalfa, but total alfalfa output, imports and exports are not reported by the USDA, so this data was also removed from the set.

particular product.[6] For lobbies that pertain to a specific crop, the entirety of the contribution is attributed to that crop. For lobbies that pertain to a set of crops, contributions are divided among crops by percentage of total value (of the set of relevant crops or products) produced. For example, if a PAC represents wheat and barley producers, the majority of the campaign contributions are defined as wheat contributions, as wheat represents a far larger percentage of total US crop production value than barley does.[7] In this case, the "total" value would be the sum of the value of wheat and barley in that year, not the sum of the value of all products studied, and the percentage value will be as a percentage of the wheat-and-barley-sum. When PACs represent a general agricultural lobby that does not specify products of interest, depending on if they cover general egg/meat production, they are indicated as "all" or "all crops." Then, as mentioned above, the contribution is divided on a weighted basis depending on the percent of total US production value each particular agricultural product represents. This dataset also ranges from 1998-2016 and is reported on a biannual basis. I also deflate the contributions to reflect 1998 dollars in each year, so that the growth of contributions is not a result of inflation over time.

Data for other control variables, used to approximate social welfare, include estimates of the export/output and import/output ratios over time. I construct these ratios based on data for gross exports, imports, and output for each product (available through the USDAs Production, Supply and Distribution database). I use metrics for social welfare of the policy due to the strong possibility that legislators choose to support a policy by investigating the change in producer and consumer surplus that it initiates. Usually, import elasticities are used as proxies for the change in producer and consumer surplus because "deadweight loss from protection is higher in industries with high import elasticities." (Gawande, 2005, p.14). However, import elasticities are often estimated with huge variance and existing data on import elasticities are inconsistent (Kee, Nicita and Olarreaga, 2008). In order to circumvent this issue, Gawande (2005) uses the import- and export-to-output ratios (which are highly correlated with import elasticities and are more consistently reported) as the proxies for the changes in producer and consumer surplus. He further explains that "the lower the import volume, the lower the social cost imposed on individuals" by support mechanisms (Gawande, 2005, p.14). Therefore, consumer opposition to support of low import volume sectors is lower (Gawande, 2005). Further, he claims "the greater the share of output exported, the greater the amount of price support" desired by consumers because "export subsidies raise their prices above the world price" but the domestic consumers are not paying this price for the good being sold abroad (Gawande, 2005, p.16). As this paper builds on Gawande (2005), it also adopts this element of his methodology and reasoning.

As demonstrated in Table 1, total contributions per year for each crop have been growing over time, despite the general trend of falling Producer Single Commodity Transfers as a percentage of value of commodity specific receipts (PSCTP, effectively PSE) and Producer Nominal Protection Coefficient (PNPC) ("an indicator of the nominal rate of protection for producers measuring the ratio between the average price received by producers at farm gate, including payments per ton of current output and the border price" [OECD, 2002]). These trends can be observed in Figures 1 and 2, which demonstrate the change in the producer support mechanisms since 1998, juxtaposed with the change in total contributions from the agribusiness sector over time. The vertical lines represent years in which congress voted on and approved Farm Bills. In Figure 1, I observe a peak in 2000, corresponding with the full implementation of the Uruguay Agriculture Agreement. Since the PSCTP covers both amber and green box policies, the decline in support suggests that green box policies were not able to compensate for the removal of amber box policies and thus producer support in general declined. Figure 2 demonstrates a kink in contributions in 2008, a presidential election year in which campaign contributions became particularly controversial and the year of a Farm Bill. After 2008, contributions continued increasing though not as rapidly as they had been in the previous decade. Interestingly, I do not observe kinks in other presidential election years or Farm Bill years.

Though the export/output ratio seems to be generally rising and the import/output ratio generally falling, there does not appear to be a strong trend.

Table 2 demonstrates that the crops with particularly large average crop-specific contributions do not necessarily receive large support transfers (e.g. beef), and products with low contributions do not necessarily receive small amounts of support (e.g. sheep). Nonetheless, some products do follow the expected trend (e.g. milk, sugar). These observations may be a result of crop value, as beef represents about 20% of the total yearly US production value, whereas sheep represents less than .1% of total yearly US production value. Therefore, the gross contributions from an industry that is creating far more value will be larger, simply as a result of budget constraints. Further, the protectionist estimates account for production value and are representations of transfers per dollar of crop value. Thus, having a high protectionism measure for wheat requires far less expenditures from the government than a high protectionism measure for beef would. This suggests that perhaps regressions should be run between contributions as a percentage of value (shown in columns 3 and 4 of Table 2) and %PSE.

IV. Methodology

For this paper, I analyze the empirical evidence for the Grossman-Helpman model of "truthful contributions" with

[6]This assumption is due to the idea that if a PAC represents the producers of a certain crop, they are attempting to maximize those producers rents net of contributions, which would occur if substantial protectionist policies were employed with respect to the specific crop they are producing.

[7]This may create bias within the data, but there are no available data on the specific intentions of the general purpose contributions. Lopez 2001 used a similar system, allocating broad coalitions contributions "to the five largest commodities in proportion to their production values." (Lopez 2001)

respect to agribusiness to determine if campaign contributions truly "buy" influence, and to what extent they are valued relative to social welfare metrics. This is evaluated by determining the relationship between agribusiness PAC contributions and the extent of protectionist measures/transfers to the producers of the particular crop being contributed (quid pro quo) on behalf of. I hypothesize that there is an economically and statistically significant positive relationship between these two factors and that total agribusiness contributions have a smaller magnitude yet still statistically significant impact on producer support. This hypothesis reflects the findings in the literature, which demonstrates that crop specific contributions have large impacts on the nontariff barrier and and agricultural subsidies (Goldberg and Maggi, 1997 and Lopez, 2001). Further, the very fact that the agribusiness continues to make large campaign contributions suggests that there is a reason doing so; it is highly likely that this reason is direct compensation by way of producer support policies.

In order to determine this relationship, I run various regressions, with two different metrics of campaign contributions (gross dollar contributions per crop and contributions as a percent of crop specific value of production in that year) regressed on two metrics of protectionism: the percent Producer Support Estimate (%PSE, which represents policy transfers to agricultural producers, measured at the farm gate and expressed as a share of gross farm receipts) and the producer Nominal Assistance Coefficient (NAC, a ratio of the value of total gross farm receipts including support and the production valued at world market prices without support). The use of %PSE and NAC is to combat the bias contributed by a trend observed in 2013, by Kym Anderson, Gordon Rausser, and Johan Swinnen, in their paper "Political Economy of Public Policies: Insights from Distortions to Agricultural and Food Markets." Anderson, Rausser and Swinnen argue that the relative importance of farm-policy instruments has changed significantly over time, with the contribution of price-distorting measures such as the nontariff barriers declining (Anderson, Rausser and Swinnen, 2013). Nonetheless, they note that the anti-trade bias within the agriculture sector has persisted, but the policies chosen to promote support of this industry are constantly altered (Anderson, Rausser and Swinnen, 2013). Producer Support Estimates and Nominal Assistance Coefficients reflect most farm-policy instruments and thus cover the broad range of options available to policy makers; using these metrics renders the changes in policy instrumentation over time insignificant. Further, the %PSE and the NAC are correlated with a coefficient of .957, significant at the .001% level. Therefore, the two estimates are virtually interchangeable for one another and I will henceforth use exclusively %PSE (PSCTP). All regressions were also run with NAC (PNPC) and yielded nearly identical results.

To determine the campaign contributions, the contributions from agribusiness PACs are analyzed and each PAC is attributed to a specific crop or a set of crops, depending on what their constituents produce (as described in the data section).

Initially I will run the following simple OLS regression, similar to that of Gawande (2005):

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2(\frac{\text{Ex}_{it}}{\text{Output}_{it}}) + \beta_3(\frac{\text{Im}_{it}}{\text{Output}_{it}}) + \epsilon_{it} \tag{1}$$

where all variables range over *i* agricultural products and *t* years. *Y* is the protectionism estimate (as %PSE and as NAC, in separate regressions), *X* is the campaign contributions from agribusiness PACs (as gross dollar contributions and first differences of contributions, in separate regressions). *Ex/Output* is the export to output ratio, and *Im/Output* is the import to output ratio, both of which will be used to represent Social Welfare of the policy, as discussed in Section III.

Campaign contributions are measured on a two-year cycle, and protectionist measures are observed yearly. To adjust for this inconsistency, the protectionist measures will be averaged between the two-years covered by a single data point for campaign contributions, to compensate for the fact that the contributions may have taken a year to take effect or be reflected in actual policy. Therefore, the *t* years in this regression (and all future specifications) include each two-year period from 1998-2016.

Then, I reform the model to the following regression, which utilizes the fact that the data are longitudinal to test a random effects model (2) and a fixed effects model (3):

$$\begin{aligned}(Y_{it} - \frac{1}{T}\sum_{t=1}^{T} Y_{it}) = \beta_0 + \beta_1(X_{it} - \frac{1}{T}\sum_{t=1}^{T} X_{it}) \\ +\beta_2(\frac{\text{Ex}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Ex}_{it}}{\text{Output}_{it}}) \\ +\beta_3(\frac{\text{Im}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Im}_{it}}{\text{Output}_{it}}) \\ +\epsilon_{it}\end{aligned} \tag{2}$$

$$\begin{aligned}(Y_{it} - \frac{1}{T}\sum_{t=1}^{T} Y_{it}) = \beta_0 + \beta_1(X_{it} - \frac{1}{T}\sum_{t=1}^{T} X_{it}) \\ +\beta_2(\frac{\text{Ex}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Ex}_{it}}{\text{Output}_{it}}) \\ +\beta_3(\frac{\text{Im}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Im}_{it}}{\text{Output}_{it}}) \\ +(\alpha - \frac{1}{n}\sum_{t=1}^{N}\alpha_i)) + \epsilon_{it}\end{aligned} \tag{3}$$

The primary change in methodology is that I will be using time panel data, from 1998-2016, whereas Gawande (2005) utilized data from 1991-2000 and ran separate regressions for each year of data (he took averages of 1991-1993, 1994-1996, and 1997-1999 and ran a "1993" "1996" and "1999" regression with each of these new datasets). Because there are many factors that are constant within a crop and that do not change substantially over time but do differ

between crops, such as the number of producers, historical relationship with the government, perception by the public, etc., using fixed effects, represented by a_i in regression 3, will allow for the removal of omitted variable bias. I also run a Hausman test to test whether fixed effects dominate random effects (expressed in regression 2), which is to say they allow for a model that better fits the data. When fixed effects dominate, this implies that a time panel model dominates an OLS regression as the correct functional form, so the Hausman test also allows for a judgment between models (3) and (1).

Secondarily, the metric I have chosen to represent support differs from Gawande (2005), in which six regressions were run for each year, with producer supports represented by quality assurance standards, specific tariffs, and countervailing duties. The use of a different protectionism metric can be attributed to an issue cited in Goldberg and Maggis paper (1997); federal governments do not make tariff policies alone. These policies are often crafted in collaboration with foreign governments or international organizations such as the WTO. Therefore, legislators do not have the direct power to impact tariff policies as a result of lobbying expenditures and campaign contributions. Transfers to producers, however, can be influenced (though the WTO has gained influence on this metric since the Uruguay Round).[8]

I also plan on expanding this regression to:

$$\begin{aligned}(Y_{it} - \frac{1}{T}\sum_{t=1}^{T} Y_{it}) = \beta_0 + \beta_1(X_{it} - \frac{1}{T}\sum_{t=1}^{T} X_{it}) \\ +\beta_2(\frac{\text{Ex}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Ex}_{it}}{\text{Output}_{it}}) \\ +\beta_3(\frac{\text{Im}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Im}_{it}}{\text{Output}_{it}}) \\ +\beta_4(\sum_{i=1}^{N} X_{it} - \frac{1}{T}\sum_{t=1}^{T}\sum_{i=1}^{N} X_{it}) \\ +(\alpha - \frac{1}{n}\sum_{t=1}^{N}\alpha_i)) + \epsilon_{it}\end{aligned} \tag{4}$$

to include a regressor representing the total industry contributions for a given year, to account for the hypothesis that agribusiness contributions are mentally aggregated and lead to higher support for the collective farm bill and transfers to agricultural producers. This is reflective of a finding put forth by Abler (1989), which showed that many agribusiness PACs represent the interests of the agribusiness sector on a broad scale. Since the Farm Bill sets policy both for agricultural programs and food subsidies, PACs support amendments that do not help the producers of their particular crop but rather benefit a potential coalition between farm PACs that represent various crops, working to push a mutual agenda and pass the bill as a whole (Abler, 1989). This implies that campaign contributions for any given product are not actually just so, but rather have an impact on policy for all other products as well. (Abler, 1989 in Callahan, 2016). I therefore investigate if the coefficient on this variable, $\sum_{i=1}^{N} X_{it}$, is more significant and of higher magnitude than that of X_{it}, the crop specific contributions.

Next, I run the following equation:

$$\begin{aligned}(Y_{it} - \frac{1}{T}\sum_{t=1}^{T} Y_{it}) = \beta_0 + \beta_1(X_{it} - \frac{1}{T}\sum_{t=1}^{T} X_{it}) \\ +\beta_2(\frac{\text{Ex}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Ex}_{it}}{\text{Output}_{it}}) \\ +\beta_3(\frac{\text{Im}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Im}_{it}}{\text{Output}_{it}}) \\ +\beta_4(\sum_{i=1}^{N} X_{it} - \frac{1}{T}\sum_{t=1}^{T}\sum_{i=1}^{N} X_{it}) \\ -\beta_5(p_{it} - \frac{1}{T}\sum_{t=1}^{T} p_{it}) - \beta_6(m_{it} - \frac{1}{T}\sum_{t=1}^{T} m_{it}) \\ +(\alpha - \frac{1}{n}\sum_{t=1}^{N}\alpha_i)) + \epsilon_{it}\end{aligned} \tag{5}$$

which includes a variable, p, to reflect the number of PACs lobbying on behalf of the specific crop, and a variable, m, representing the number of PACs lobbying for other crops in that year (due to the alternative possibilities that the other PACs are competitors or that they are furthering the same goal). I later refer to these variables as the "concentration" of the crops lobby and of the other-crop agribusiness lobbies. These variables will account for the finding in Gawande and Bandyopadhyays paper (2000) finding that the concentration of industry PACs and competing PACs is significant in determining support metrics.

As a final step, I will run the following regression:

$$\begin{aligned}(Y_{it} - \frac{1}{T}\sum_{t=1}^{T} Y_{it}) = \beta_0 + \beta_1(X_{it} - \frac{1}{T}\sum_{t=1}^{T} X_{it}) \\ +\beta_2(X_{i(t-1)} - \frac{1}{T}\sum_{t=1}^{T} X_{i(t-1)}) \\ +\beta_3(\frac{\text{Ex}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Ex}_{it}}{\text{Output}_{it}}) \\ +\beta_4(\frac{\text{Im}_{it}}{\text{Output}_{it}} - \frac{1}{T}\sum_{t=1}^{T}\frac{\text{Im}_{it}}{\text{Output}_{it}}) \\ +\beta_5(\sum_{i=1}^{N} X_{it} - \frac{1}{T}\sum_{t=1}^{T}\sum_{i=1}^{N} X_{it}) \\ +\beta_6(\sum_{i=1}^{N} X_{i(t-1)} - \frac{1}{T}\sum_{t=1}^{T}\sum_{i=1}^{N} X_{i(t-1)}) \\ +(\alpha - \frac{1}{n}\sum_{t=1}^{N}\alpha_i)) + \epsilon_{it}\end{aligned} \tag{6}$$

[8]The change in metric for support applies to both the first and second specifications of the model. The use of fixed and random effects applies exclusively to the second model, which will be compared to the first.

to include a time lagged variable for each contribution based variable $(X_{it}, \sum_{t=1}^{T} X_{it})$ and account for the possibility that contributions in a given year do not impact policy immediately. This is because campaign contributions will affect the future legislators, not necessarily the present ones, and because the Farm Bill which determines support quantities is passed every five years and so policies may not be able to meaningfully change on a two-year basis. I have represented this time lagged variable with a subscript of $t-1$ but each period t represents a two-year congressional cycle, and thus subtracting one actually indicates the former period, or two years prior.

V. I. Results and Discussion

Table 3 below demonstrates the results of various specifications of the relationship between PAC contributions and Producer Single Commodity Transfers as a percent of Production Value (the Y variable in all specifications). [9]

The most basic OLS specification of the regression yields the expected sign of the coefficient on the contributions variable, at a high significance level. The model suggests that for every 1% increase in the campaign contributions to crop value ratio is associated with a 23,451% increase in the Producer Single Commodity Transfers as a percent of value of commodity specific receipts. This magnitude of this coefficient is extremely large, which suggests that small changes in contributions can have enormous impacts on the support mechanisms that the interest group receives. This is reflective of the model observed in the literature. The size of the coefficient can be explained by the fact contributions are received when legislators are vulnerable and small contributions have the power to make large changes in legislators election prospects. However, there is a degree of uncertainty because the legislators are not guaranteed to win the election. Therefore, in order to ensure these contributions are made, legislators must sufficiently compensate the donors for the inherent risk in their investments.

The next specification of the model demonstrates that when the impact of total agribusiness contributions and the amount of PACs representing both the crop and the agribusiness industry aside from the crop are considered, the crop specific campaign contributions still have a statistically significant large positive association with support mechanisms for the particular crop. This impact is marginally lower, suggesting that the first specification may have picked up some omitted variable bias. The statistically significant negligible impact of the total agribusiness contributions is fascinating; it suggests that industry wide contributions do not have any impact on support mechanisms. Perhaps this is because each set of campaign contributions is competing with the other contributions for a higher allocation of the total funds available for agricultural support, while simultaneously working to pass the Farm Bill as a whole, which leads to a cumulative zero effect on crop-specific support. The concentration/quantity of PACs representing other crops has a statistically significant positive impact on the support mechanisms received; perhaps this suggests that when other crops are not well organized the crop of interest is more successful in receiving support mechanisms. This seems inconsistent with the fact that the concentration of lobbies for the particular crop do not have a significant impact on the support mechanisms received. Nonetheless, the crop specific contributions variable is associated with PSE as expected; every small contribution is magnified into large transfers to its producers. This initially suggests that the relationship between crop-specific campaign contributions and support mechanisms has not changed since Gawandes 2005 paper, which used data from the 1990s. Even running a regression for the years after 2000, at which point the Uruguay Round Agriculture Agreement had been fully implemented by developed countries including the United States, yields very similar coefficients.

However, when the support and contributions data is used as a panel, this historical relationship seems to erode. The random effects model yields an insignificant negative coefficient (opposite that which is predicted by theory and existing literature). However, a Hausman test between the fixed and random effects models indicates that the fixed effects model dominates with a p-value ¡ 0.0001. Given that the fixed effects very significantly fits the data better than a random effects level, the OLS regression is also implicitly dominated. For this reason, the random effects models are not displayed in Table 3, and the OLS specifications remain for the sake of comparison to existing literature.

The first specification of a fixed effects model, which controls for differences that are constant over time but differ per crop, yields a statistically insignificant enormous negative coefficient on the crop-specific contributions variable. The second specification yields a less negative and less statistically significant coefficient on the crop specific contributions variable, in addition to a highly significant zero coefficient on the total agribusiness contributions variable. Adding the concentration of the PACs representing the crop of interest and the concentration of PACs for other products in the industry has a negligible impact on the coefficients of interest, and the added variables are statistically insignificant. The next specification of the fixed effects model exclusively includes the time-lagged version of the crop specific contributions variable and the total agribusiness contributions variable. The current equivalents of these variables are excluded due to the high correlations between these variables and the time-lagged versions. The crop specific contributions have a correlation of .9542 with their non-lagged equivalents, and the total contributions have a correlation of .9838 with the non-lagged equivalent. This level of correlation would lead to a high level of co-linearity within the equation. Nonetheless, the time-lagged variable for crop specific contributions is statistically insignificant, and the total contributions variable has no correlation with support mechanisms at a highly significant level. The time-lagged crop-specific contributions variable remains negative but is of lower magnitude and

[9] All regressions shown in the table are using data in which extreme outliers have been removed; the removal of outliers had no significant effect on the coefficients displayed in Table 3.

higher statistical significance than its current equivalent. This suggests that there is a lag in the impact of contributions on policy. However, since the time-lagged variable remains statistically insignificant, no conclusive relationships can be drawn.

When the fixed effects regression is applied solely to the years after 2000, to reflect the efficacy of crop specific campaign contributions since the implementation of the Uruguay Round Agriculture Agreement, the coefficient on this variable of interest is positive but is also very highly statistically insignificant. This suggests that there is no significant correlation between crop specific campaign contributions and supports to producers of that crop since 2000. All other variables maintain similar coefficients, suggesting that prior analyses of their impacts still hold after 2000.

Taken together, the fixed effects specifications demonstrate that there is a statistically insignificant relationship between crop specific campaign contributions and supports transferred to the producers of that crop. The magnitude of the coefficients on this variable are large (and primarily negative), but this is likely due to the consistently extremely small contributions to production value ratios, which allow for very small changes to be associated with enormous changes in the far more volatile and much larger numbers represented by the support mechanisms (even as a percentage of crop production). The models consistently demonstrate a statistically significant lack of association between total agribusiness contributions and crop specific campaign contributions. The explanation for this relationship remains the same as for the OLS specification, as the significance and coefficient of the relationship do not change in the fixed effects specifications. Overall, these results show that none of the tested factors significantly predict the support mechanisms, contrary to what is demonstrated in the literature. It appears that the strong positive association between crop specific contributions and support mechanisms observed in the literature may be entirely due to omitted variable bias that is incorporated into the OLS models. Running a Ramsay Reset Test rejects the null hypothesis that the OLS specifications have no omitted variables with a significance level below .001 %, suggesting that the linear regression used in the literature does suffer from omitted variable bias.

To determine why the OLS regression yields such a significant, high magnitude, positive coefficient (even with clustered standard errors by crop, robust to heteroskedasticity), I also ran separate OLS regressions for each crop group (see Appendix). From these regressions we gather that an increase in contributions as a percent of yearly production value is only associated with an increase single commodity transfers to producers in any two of the fourteen products studied at a statistically significant level (cotton, maize); a statistically significant negative association is observed in one of the products studied (milk). However, the OLS regression contains omitted variable bias from the fact that some crops which consistently make more campaign contributions also consistently receive more transfers and vice versa. This could be due to a historical relationship with policymakers, for which the producers are paying maintenance fees, or due to specific features inherent to particular crops that are unrelated to contributions. When we hold constant for these crop-specific features, we no longer observe the relationship that exists in the literature on this topic.

This begs the question, if campaign contributions do not result in support mechanisms for the donors, then why are the contributions being made? It is possible that support mechanisms, mainly transfers, covered by the PSE are not what the lobbies desire. Perhaps there are desired standards and regulations that would benefit crop producers abilities to sell their products effectively and these are of higher priority than direct transfers. An example of these policies is the USDAs "organic" standard, which has far fewer restrictions and qualifications than that of many European economies. The lack of emphasis on transfers may also be due to the external constrains on how the United States government can support farmers, resulting from trade agreements. Another possibility is that there is merely misinformation about the efficacy of the contributions. Since contributions come from a large variety of PACs and transfers are spread among many producers, the trends between these variables may not be easily observable to those making the contributions. Finally, another possibility is that there was a statistically significant positive relationship between crop specific campaign contributions and transfers to agricultural producers prior to the full implementation of the Uruguay Agriculture Agreement. However, as implementation of support is restricted the ability to translate campaign contributions directly into transfers to the contributors has become more difficult, and this change has not yet been adjusted for by agribusiness PACs.

VI. Conclusion and Limitations

This paper observes an insignificant trend between crop specific campaign contributions and producer single commodity transfers when omitted variable bias particular to each crop is accounted for using a fixed effects regression. The total agribusiness contributions have a consistently significant near zero effect on support mechanisms. This work is in contrast with most existing literature on purchasing policy in the agribusiness sector and sheds light on the deficiencies of past models used to study this relationship. The change may also be due to a changing political climate and attitudes toward agriculture protection in the 21st century.

There are potential pitfalls with my methodology however. It is possible that crop specific contributions and total yearly contributions display multi-collinearity and follow the same trend over time. When the total agribusiness contributions variable is added, the coefficient on crop specific contributions changes significantly, and its standard error increases. Nonetheless, the coefficient remains statistically significant and of large magnitude, so I do not consider this a detriment to the study. Another potential pitfall is rooted in the allocation of general purpose agribusiness PAC contributions to specific crops. As described in Section III, when PACs represent a general agricultural lobby, depending on if they also include egg/meat production, they are indicated as "all"

or "all crops." Then, the contribution is divided on a weighted basis depending on the percent of total US production value that agricultural product represents. This is problematic when it comes to State-specific PACs (e.g. Illinois Agricultural Association, California Farm Bureau), because each crop represents a different percent of total production on a state-by-state basis than it does on a national basis. If the intuition behind the initial allocation (PACs lobby for the crops that are more prominent among their producers) holds, then allocation of contributions from State-specific PACs should be done separately from multipurpose national PACs. This is an area for future research and work in data reprocessing.

Further, when I use the concentration of competing or contributing lobbies as a variable (quantity of PACs lobbying on behalf of that product), I am only accounting for other agribusiness lobbies. This excludes processed food lobbies and other downstream industries which also have the potential to support agribusiness subsidies and oppose agribusiness tariffs (somewhat contributing and somewhat competing with the interests of the agricultural product producers).

In addition, there is problem of price endogeneity. Support mechanisms represented by the PSE are dependent on the market prices; dividing the crop specific contributions term by production value may lead to omitted variable bias in that the support mechanisms are linked with the production values. However, this relationship is not particularly evident in the data; the peak years of food price indices in this time period, including 2001, 2008 and 2011, and years in which major food price drops occur, mainly the period from 2004-2006, do not represent turning points in the trend or amount of support. (USDA, 2016, Figure 1) If there is correlation of price and support, however, this may lead the regression dependent variables to be correlated with the error term and has the potential to introduce bias into the model.

Future research should be conducted on the impact of donations to the Democratic and Republican parties, and if party affiliation impacts the efficacy of the contribution in translating into transfers. Another area for further research includes the purposes of high campaign contributions, in the case that transfers are not the desired result. Potential options include regulations, marketing controls, and laws regarding organic produce and genetically modified organisms.

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APPENDIX

Table 1: Summary Statistics by Year

	Observations	Crop Specific Total Contributions (Mean)	Crop Specific Total Contributions (SD)	Export/ Output (Mean)	Export/ Output (SD)	Import/ Output (Mean)	Import/ Output (SD)	PSCTP (Mean)	PSCTP (SD)	PNPC (Mean)	PNPC (SD)
Units		Millions of 1998 Dollars	Millions of 1998 Dollars	Ratio	Ratio	Ratio	Ratio	%	%	Ratio	Ratio
Year											
1998	12	.5292	.5135	0.18	0.16	0.20	0.57	13.13	17.61	1.21	0.37
2000	12	.5754	.5376	0.21	0.18	0.16	0.40	20.88	21.51	1.46	0.94
2002	13	.6290	.6361	0.25	0.23	0.14	0.28	16.78	17.81	1.22	0.33
2004	14	.7184	.7207	0.23	0.21	0.15	0.30	13.45	15.65	1.20	0.32
2006	13	.8501	.8479	0.27	0.25	0.17	0.30	7.30	8.94	1.07	0.11
2008	13	1.0363	1.0276	0.26	0.27	0.14	0.27	7.39	10.73	1.07	0.15
2010	14	1.0648	1.0836	0.28	0.25	0.13	0.25	6.64	9.25	1.07	0.14
2012	14	1.0929	1.0852	0.25	0.23	0.15	0.25	5.21	5.39	1.03	0.07
2014	13	1.1569	1.1386	0.28	0.24	0.16	0.30	6.69	7.26	1.05	0.10
2016	14	1.1998	1.1072	0.28	0.26	0.15	0.33	6.69	8.50	1.05	0.13

Sources: USDA, OECD, OpenSecrets
Notes: PSCTP indicates Producer Single Commodity Transfers as a percent of value of commodity specific receipts
PNPC indicates Producer Nominal Protection Coefficient

Table 2: Summary Statistics by Agricultural Product

	Ob ser- vati ons	Crop Specific Contributions (Mean)	Crop Specific Contributions (SD)	Crop Specific Contributions / Production Value (Mean)	Crop Specific Contributions / Production Value (SD)	Export Output Ratio (Mean)	Export Output Ratio (SD)	Import Output Ratio (Mean)	Import Output Ratio (SD)	PSCTP (Mean)	PSCTP (SD)	PNPC (Mean)	PNPC (SD)
Units		Millions of 1998 Dollars	Millions of 1998 Dollars	Ratio * 1000	Ratio * 1000	Ratio	Ratio	Ratio	Ratio	%	%	Ratio	Ratio
Crop													
Barley	10	.0452	.0159	.0544	.0186	0.08	0.05	0.08	0.03	6.57	3.93	1.04	0.06
Beef	9	1.3066	.3594	.0329	.0062	0.08	0.03	0.11	0.02	0.62	1.67	1.01	0.02
Cotton	10	.5799	.1578	.1219	.0398	0.68	0.20	0.00	0.01	21.52	10.58	1.22	0.18
Soybeans	9	.5313	.2865	.0184	.0036	0.34	0.05	0.00	0.00	5.24	6.12	1.04	0.08
Sheep	9	.0305	.0052	.0801	.0227	0.05	0.03	0.91	0.27	9.51	3.54	1.09	0.03
Sorghum	10	.0905	.0507	.0713	.0343	0.48	0.15	0.00	0.01	10.80	4.73	1.03	0.05
Eggs	10	.2138	.0553	.0359	.0083	0.03	0.01	0.00	0.00	0.00	0.00	1.00	0.00
Poultry	10	.8315	.1372	.0342	.0071	0.16	0.02	0.00	0.00	0.02	0.03	1.00	0.00
Sugar	10	3.0299	1.0438	1.2084	.3376	0.02	0.01	0.33	0.11	37.29	12.54	1.64	0.33
Maize	9	.9012	.4588	.021	.0048	0.16	0.04	0.00	0.00	5.50	3.64	1.03	0.05
Pig	9	.4619	.1481	.0311	.0053	0.15	0.06	0.04	0.01	0.14	0.42	1.00	0.00
Wheat	10	1.4484	.4834	.1467	.0261	0.47	0.06	0.05	0.01	7.85	3.22	1.03	0.05
Rice	8	.5301	.2317	.2297	.0489	0.48	0.05	0.08	0.02	9.52	14.91	1.14	0.26
Milk	9	2.0455	.5224	.0693	.0224	0.00	0.00	0.00	0.00	23.87	17.03	1.40	0.38

Sources: USDA, OECD, OpenSecrets
Notes: PSCTP indicates Producer Single Commodity Transfers as a percent of value of commodity specific receipts
PNPC indicates Producer Nominal Protection Coefficient

The total number of observations for both Table 1 and Table 2 is 132; this reflects the removal of extreme outliers. The outliers were beef in 2014, soybeans in 2000, sheep in 1998, maize in 2006, pig in 1998, rice in 2000 and 2002, and milk in 2008, all of which were more than three standard deviations away from their crop specific PSCTP mean. Tables 1 and 2 reflect the quantity of observations after the removal of outliers. The removal of outliers had the effect of largely normalizing the residuals between predicted and observed Y variables.

Table 3: OLS, Random and Fixed Effects Regression Coefficients

Dependent Variable:	OLS	OLS	OLS After 2000	Panel Fixed	Panel Fixed	Panel Fixed	Panel Fixed	Panel Fixed After 2000
Crop Specific Contributions/ Crop Production Value	**23451.220*** **	**22607.95*** **	**21218.99*** **	**-10385.260**	**-4312.117**	**-4477.492**		**1293.533**
	0.000	0.000	0.000	0.114	0.471	0.462		0.845
Import/Output Ratio	**0.153**	**3.607**	**4.362*** **	**-23.122*** **	**-10.748**	**-11.203**	**-17.875**	**-19.941** **
	0.978	0.386	0.004	0.009	0.188	0.179	0.066	0.031
Export/Output Ratio	**2.652**	**4.485**	**7.609**	**-7.475**	**2.366**	**2.320**	**-.005**	**0.377**
	0.825	0.730	0.115	0.334	0.742	0.748	1.000	0.963
Total Agribusiness Contributions		**0.000*** **	**0.000*** **		**0.000*** **	**0.000*** **		**0.000*** **
		0.006	0.002		0.000	0.000		0.000
Crop Specific PAC concentration		**.208**	**0.128**			**-0.106**		**0.010**
		0.441	0.147			0.740		0.976
All-Other-Crop PAC Concentration		**.015** **	**3.456**			**0.020**		**0.014**
		0.012	0.722			0.448		0.596
Time-lagged Crop Specific Contributions/ Crop Production Value							**-9915.458**	
							0.123	
Time-lagged Total Agribusiness Contributions							**0.000*** **	
							0.000	
Constant	**5.380**	**3.816**	**3.456**	**15.796*** **	**22.405*** **	**15.157**	**23.646*** **	**13.831**
	0.258	0.558	0.317	0.000	0.000	0.109	0.000	0.103
N	132	132	108	132	132	132	113	108
R Squared	0.333	0.462	0.527	0.136	0.004	0.015	0.138	0.001
F-Statistic	111.5	121.22	12.87	16.46	17.43	16.4	15.32	11.07

P-values are beneath coefficients and not in bold.
*** p<0.01, ** p<0.05, * p<0.1

In the following tables we observe the insignificant correlation of campaign contribution within each crop. Each of these regressions has a small amount of observations, but seven of the fourteen regressions exhibit negative coefficients of high magnitudes on the contributions variable. Further, the total agribusiness contributions have a consistently significant coefficient of approximately zero across crops. The import and export to output ratios are rarely significant and vary in sign.

Table 4

	(1)	(2)	(3)	(4)	(5)
VARIABLES	OLS Barley	OLS Beef	OLS Cotton	OLS Soybeans	OLS Sheep
Crop Specific Contributions/ Crop Production Value	13,623	-24,773	143,133*	-237,051	37,653
	(55,811)	(21,788)	(65,208)	(259,344)	(46,303)
Export/Output Ratio	-20.12	8.757	4.852	55.81	-47.10
	(22.94)	(7.696)	(20.72)	(81.51)	(27.00)
Import/Output Ratio	-7.023	10.60	-218.0	109.5	2.919
	(27.20)	(9.074)	(249.8)	(348.2)	(4.052)
Total Agribusiness Contributions	0.000***	0.000	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	22.40**	-0.673	44.98**	1.582	13.65*
	(6.801)	(0.597)	(11.67)	(8.676)	(5.590)
Observations	10	9	10	9	9
R-squared	0.800	0.460	0.860	0.261	0.792

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5

	(6)	(7)	(8)	(9)	(10)
VARIABLES	OLS Sorghum	OLS Eggs	OLS Poultry	OLS Sugar	OLS Maize
Crop Specific Contributions/ Crop Production Value	24,085	-92.46	1,283	8,243	374,699*
	(42,747)	(99.61)	(2,776)	(14,814)	(137,648)
Export/Output Ratio	1.887	-0.548	1.281	-30.28	-65.12
	(5.351)	(0.325)	(0.993)	(192.7)	(51.47)
Import/Output Ratio	36.09	-0.294	4.289	-96.31***	-313.8
	(47.29)	(0.209)	(51.98)	(21.85)	(299.3)
Total Agribusiness Contributions	-1.20e-06**	1.40e-09	-5.77e-09	-1.05e-06	-1.31e-06*
	(3.83e-07)	(7.66e-10)	(1.63e-08)	(1.74e-06)	(5.10e-07)
Constant	22.49**	0.003	-0.171	72.23***	25.03
	(5.848)	(0.007)	(0.239)	(4.385)	(12.71)
Observations	10	10	10	10	9
R-squared	0.598	0.644	0.238	0.887	0.662

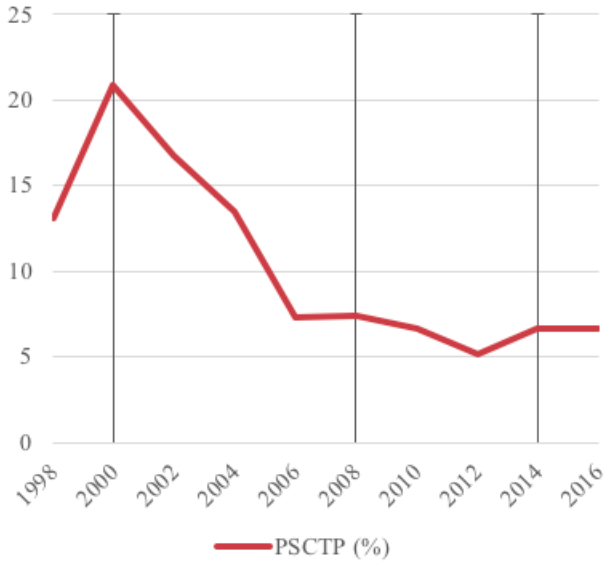
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6

	(11)	(12)	(13)	(14)
VARIABLES	OLS Pig	OLS Wheat	OLS Rice	OLS Milk
Crop Specific Contributions/ Crop Production Value	0.644	23,105	45,788	-310,166**
	(0.582)	(49,985)	(26,373)	(80,253)
Export/Output Ratio	0.000	-1.438	-3.173	-3,936
	(0.000)	(17.99)	(18.31)	(5,306)
Import/Output Ratio	0.002*	16.79	-96.95	-31,012
	(0.001)	(133.8)	(73.60)	(52,259)
Total Agribusiness Contributions	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.000184**	10.36	5.591	99.22***
	(0.000)	(10.97)	(7.874)	(17.91)
Observations	9	10	8	9
R-squared	0.846	0.232	0.680	0.935

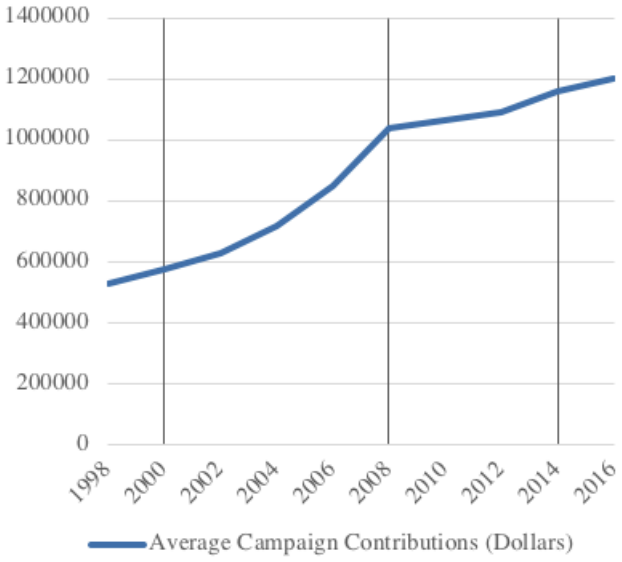
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 1: Support Over Time



Sources: USDA, OECD
Notes: PSCTP indicates Producer Single Commodity Transfers as a percent of value of commodity specific receipts
Vertical lines indicate years in which Farm Bills are voted on

Figure 2: Contributions Over Time



Sources: OpenSecrets

Notes: Vertical lines indicate years in which Farm Bills are voted on