

## **USDA Farm Service Agency Relief Payment Distributions for Iowa in 2020**

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## **Executive Summary**

The USDA Farm Service Agency (FSA) Relief Payment Distributions for Iowa (2020) dataset provides insight into how federal agricultural support shifted during an exceptionally turbulent year. In 2020, the United States faced the combined impacts of the COVID-19 pandemic and ongoing global trade disruptions—factors that significantly influenced farm income stability and relief policy implementation.

This analysis explores how crisis-driven FSA payments compared to traditional program distributions within Iowa. The results reveal a striking disparity: crisis payments totaled more than \$2.5 billion, while traditional payments amounted to approximately \$750 million. In other words, emergency relief payments were over three times greater than standard FSA disbursements, underscoring the extraordinary fiscal response required to stabilize the agricultural sector during this period.

## USDA Farm Service Agency Relief Payment Distributions for Iowa in 2020

The Farm Service Agency (FSA) is a program within the U.S. Department of Agriculture (USDA) that operates through congressional appropriations as part of the broader USDA budget. Payments are distributed based on factors such as potential need, the number of farmers in each state, the value of farm assets, and net farm income (U.S. Department of Agriculture, Farm Service Agency, n.d.).

Iowa serves as a particularly compelling case study due to its vast agricultural output and diversity of farm operations—from small family-owned farms to large industrial producers that vary significantly in size, crop type, and financial obligations. Because of this heterogeneity, shifts in national or global economic conditions are often strongly reflected in Iowa’s agricultural economy.

Our central assumption was that, given Iowa’s agricultural scale and structure, the COVID-19 pandemic and the U.S.–China trade war—both occurring in 2020—would produce measurable effects on FSA payment distributions. The COVID-19 pandemic caused unprecedented disruptions to the global economy, with millions of cases, widespread lockdowns, and major interruptions to the American supply chain, including agriculture. Market volatility, price declines, school closures, transportation breakdowns, and the temporary shutdown of meat processing plants—alongside the permanent closure of more than 72,000 restaurants nationwide (Carman, 2022)—led to a sharp decline in agricultural demand.

To stabilize the sector, the U.S. government implemented a range of emergency relief programs through the FSA. According to our analysis, over \$2.1 billion in funds distributed in Iowa during 2020 were tied directly to COVID-19 relief efforts. Simultaneously, escalating tensions between the United States and China—one of the largest importers of U.S. agricultural

goods—resulted in successive rounds of retaliatory tariffs, further intensifying market uncertainty. In response, Congress convened emergency funding sessions to provide additional financial support to farmers facing these concurrent crises.

To examine the nature and scope of these congressional appropriations, we utilize the USDA FSA 2020 Iowa Payment Disbursement dataset. Key variables include County FSA Name, Disbursement Amount, Payment Date, Accounting Program Description, and Accounting Program Year (see Table 1 for the data dictionary). The dataset contains 722,109 observations, representing a total FSA disbursement of \$3,289,242,219.48. By analyzing these 2020 disbursements, we aim to uncover patterns that reveal how the COVID-19 pandemic and the trade war influenced Iowa's agricultural sector.

The 2020 crises were neither the first nor the last to impact American farmers. As of 2025, continued geopolitical tension and shifting trade dynamics—such as renewed strains between the United States and China—suggest that similar economic pressures may soon emerge. Farmers in states like Arkansas are already voicing concerns about sustaining operations amid fluctuating export markets and rising costs. Understanding the scale and structure of the 2020 relief response provides valuable context for evaluating potential future interventions in U.S. agriculture and the policymaking processes that guide them.

### **Research Questions**

**Primary focus:** How do crisis-driven FSA payments in 2020 compare to traditional FSA distributions in the state of Iowa?

**Sub-question 1:** What proportion of total FSA disbursements in 2020 were emergency relief payments versus ongoing program payments? Did emergency programs follow different temporal patterns than regular payment cycles?

**Sub-question 2:** Did crisis payments reach the same recipients as traditional programs, or did they expand assistance to new beneficiaries? Were emergency payment patterns more or less variable than ongoing support programs? Did the distribution of top and bottom recipients change with the introduction of emergency payments?

**Sub-question 3:** Which counties received the largest share of emergency relief funds? How did the geographic distribution of crisis payments compare with that of traditional FSA disbursements under normal conditions?

### **Methodology**

After importing the dataset, each column was inspected for missing values, unique value counts, and representative samples to ensure data integrity. During this process, we discovered that the dataset listed 100 counties, whereas Iowa has only 99. The discrepancy occurs because the FSA divides Pottawattamie County into East and West administrative regions. As of 2023, Pottawattamie ranks as the highest corn-producing county in the United States (USDA NASS, 2024), so this split is likely intended to simplify administrative management.

Roughly 15% of observations contained entries in the Address Information column. Upon further inspection, these entries appeared to provide supplementary address details for farms whose Payee Name included entities such as “Trust,” “LLC,” “Inc.,” or “Estate.” The Accounting Program Year column had 579 missing values, all concentrated in four specific accounting programs. Three of these programs contained fiscal-year information directly in their names (e.g., ECP/HMC COST SHARE FY19), so we created a custom function to populate missing year values accordingly.

Because all observations had identical values for State FSA Code (=19) and State FSA Name (=Iowa), those columns were removed from further analysis. The Accounting Program Code

field was then mapped to its descriptive labels, and a new categorical variable, General Program, was created to group similar programs for easier interpretation. These groupings were cross-checked and verified to the best of our knowledge.

We produced basic distribution plots of payment amounts by General Program, separating quartiles 1–3 (Figure 1) from quartile 4 (Figure 2) to visualize scale differences among recipients.

To isolate relief-specific support, we generated a binary variable, Crisis Payment, coded as 1 when General Program equaled “COVID Relief” or “Trade War Relief.” This allowed comparison between crisis-related payments and traditional program disbursements. A two-sample t-test was conducted to evaluate whether the mean payment amounts differed significantly between these groups.

To incorporate temporal dynamics, we created a Payment Quarter variable assigning each transaction to quarters 1–4 based on month. We then ran ANOVA tests on both crisis and non-crisis payments by quarter to assess whether mean disbursement amounts varied significantly over time.

Finally, an exploratory attempt to differentiate between small and large operations using Payee Name and Address Information was abandoned. The assumptions underlying these proxies did not hold—most notably, the largest recorded payment went to Titan Swine, a large industrial entity that would not have been captured under our initial name-based criteria.

## Results and Analysis

**Sub-question 1:** Crisis-driven FSA payments far exceeded traditional assistance in Iowa. Of all 2020 disbursements, 77 percent were categorized as Crisis Payments, composed of 84 percent COVID-19 Relief and 16 percent Trade War Relief programs (see Table 2). A two-sample t-test comparing Crisis Payments to Normal Payments produced a t-statistic of 305.42 with a p-value

less than 0.0001, indicating a statistically significant difference in mean payment amounts between the two groups.

These results confirm that emergency assistance dominated FSA activity in 2020, both in magnitude and scale. Temporal analysis further showed that crisis payments followed distinct distribution patterns, with larger disbursements concentrated in specific quarters that correspond to major relief program rollouts rather than the steady cyclical timing typical of traditional payments.

**Sub-question 2:** To investigate whether crisis payments reached new beneficiaries or overlapped with existing programs, separate tables were created for crisis and non-crisis payments, and unique payee names were identified for each. The dataset contained 104,450 unique payees, who—if assistance were evenly distributed—would have received roughly seven payments each (see Table 2).

The results showed that 34,184 payees received non-crisis support only in 2020, 11,640 received crisis support only, and 58,626 received both crisis and non-crisis assistance. Total disbursements for these groups were as follows:

- Non-crisis only: \$125,410,017.06 across 75,428 payments
- Crisis only: \$124,762,494.48 across 38,036 payments

Although fewer recipients received crisis-only payments, their average payment size was approximately double that of non-crisis recipients. Several first-time beneficiaries also received unusually large awards. For instance, Titan Swine received nearly seven million dollars in COVID-19 relief despite no prior FSA history, and New Era Partnership received almost four million dollars under similar circumstances. These cases suggest that emergency programs expanded beyond traditional recipients to stabilize high-impact agricultural enterprises.

**Sub-question 3:** Spatial analysis revealed that crisis payments reached all 99 Iowa counties, confirming that emergency relief had a statewide impact. However, the concentration of large payments varied considerably. Sioux County alone accounted for four of the six payments exceeding one million dollars (see Figure 5), highlighting its dominant role in both crisis and non-crisis distributions.

Beyond these outliers, payment distributions appeared relatively balanced across counties, though crisis payments showed a slightly greater dispersion, reflecting the urgency and reach of relief programs. Figure 5 presents side-by-side pie charts illustrating the proportionate county-level distribution for crisis and non-crisis payments, showing a strong alignment in geographic spread despite differences in magnitude.

### Conclusion

The COVID-19 pandemic—and, to a lesser extent, the U.S.–China trade war—had significant global impacts. Our analysis shows that financial assistance provided to Iowa’s agricultural sector in 2020 exceeded typical FSA distributions by approximately 2.8 times. This extraordinary level of support had major implications at both the local and national levels, as Iowa produces roughly one-fourteenth of the nation’s food supply (Iowa Area Development Group, n.d.).

While it is hoped that a crisis of COVID-19’s magnitude will not recur, current geopolitical conditions suggest that agriculture remains highly vulnerable to economic shocks. The United States is again navigating a period of trade friction—this time involving multiple nations and a broader regime of tariffs that challenge post-free-trade economic norms. These developments present valuable opportunities for continued research into the financial and policy implications of modern trade disputes using current data at the national scale.

Future studies could extend this analysis beyond Iowa to examine whether the proportion of crisis payments remains consistent across other agriculturally dominant states, or to explore potential correlations between payment distribution, regional economic conditions, and even voting patterns. Such research could deepen our understanding of how federal agricultural relief operates under crisis conditions and inform more resilient policy frameworks for the future.

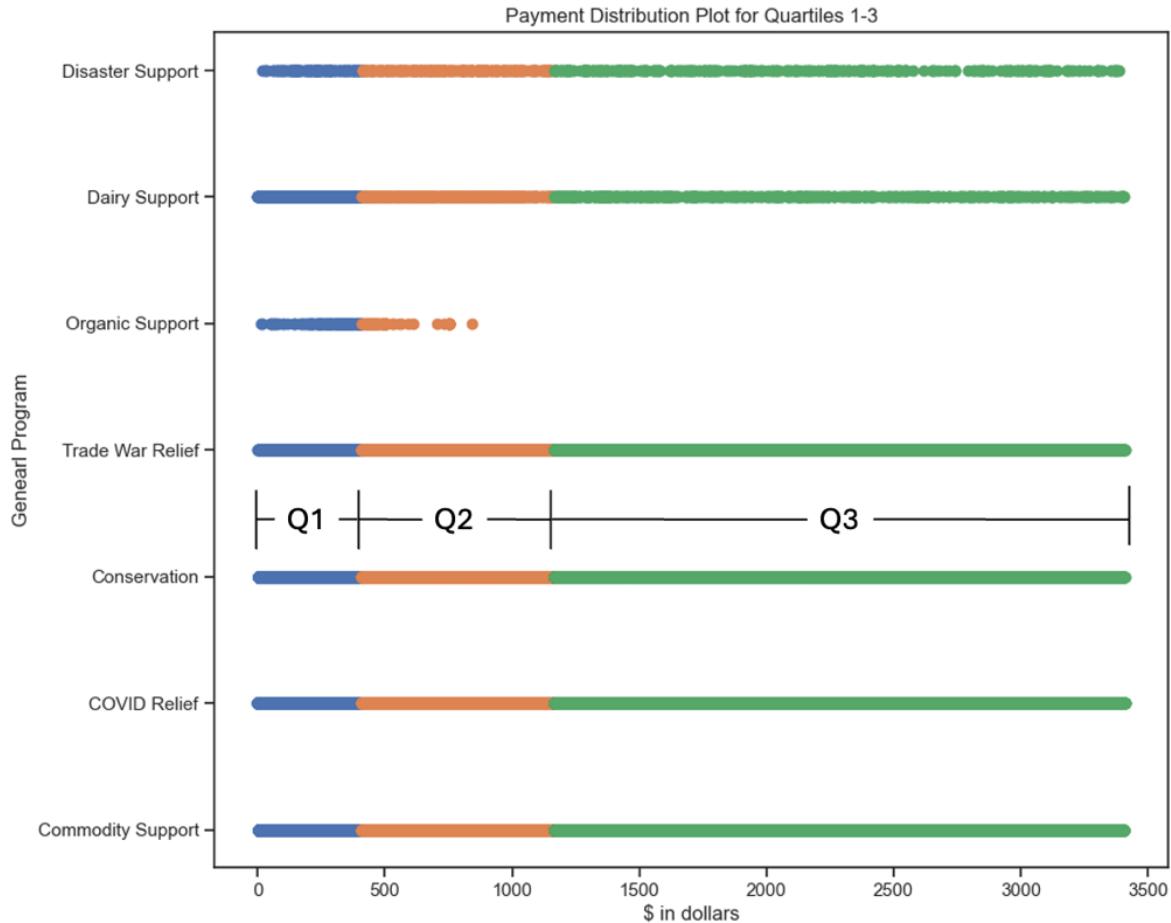
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## Figures and Tables

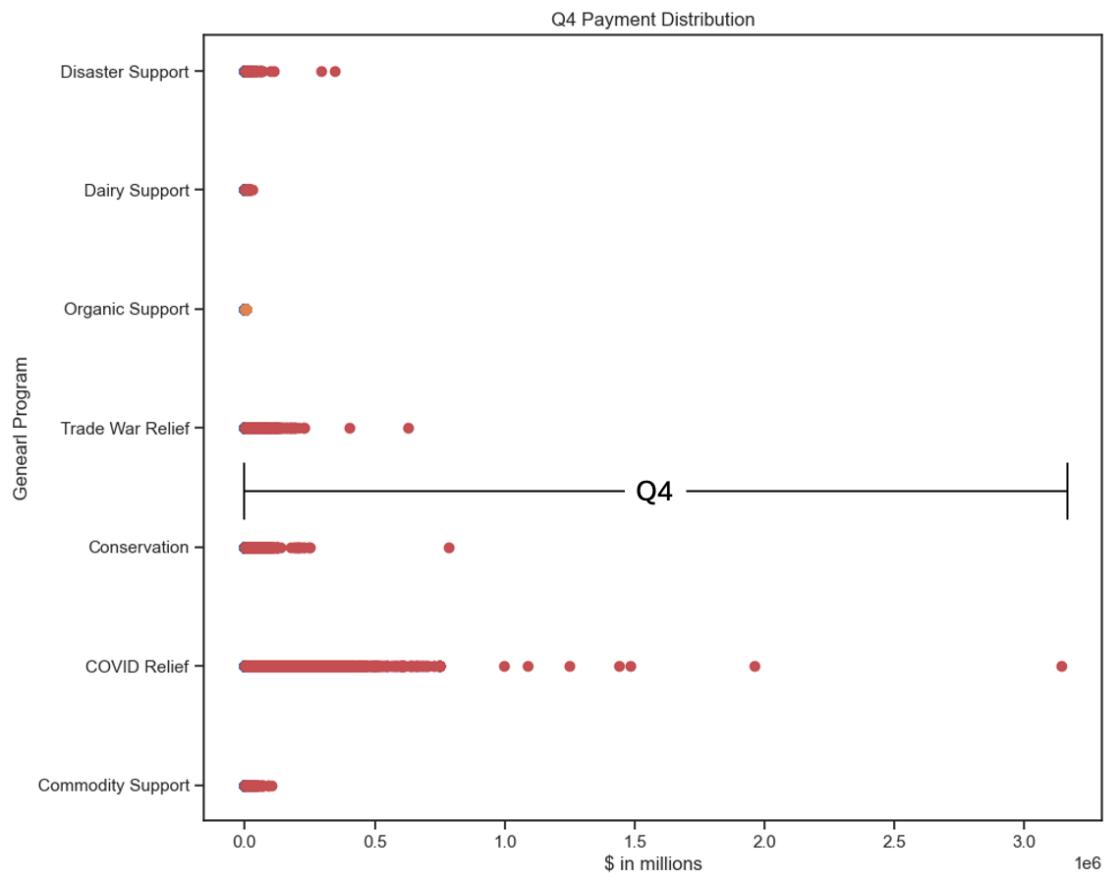
**Figure 1**

*Payment distribution plot grouped by General Program for quartiles 1-3.*



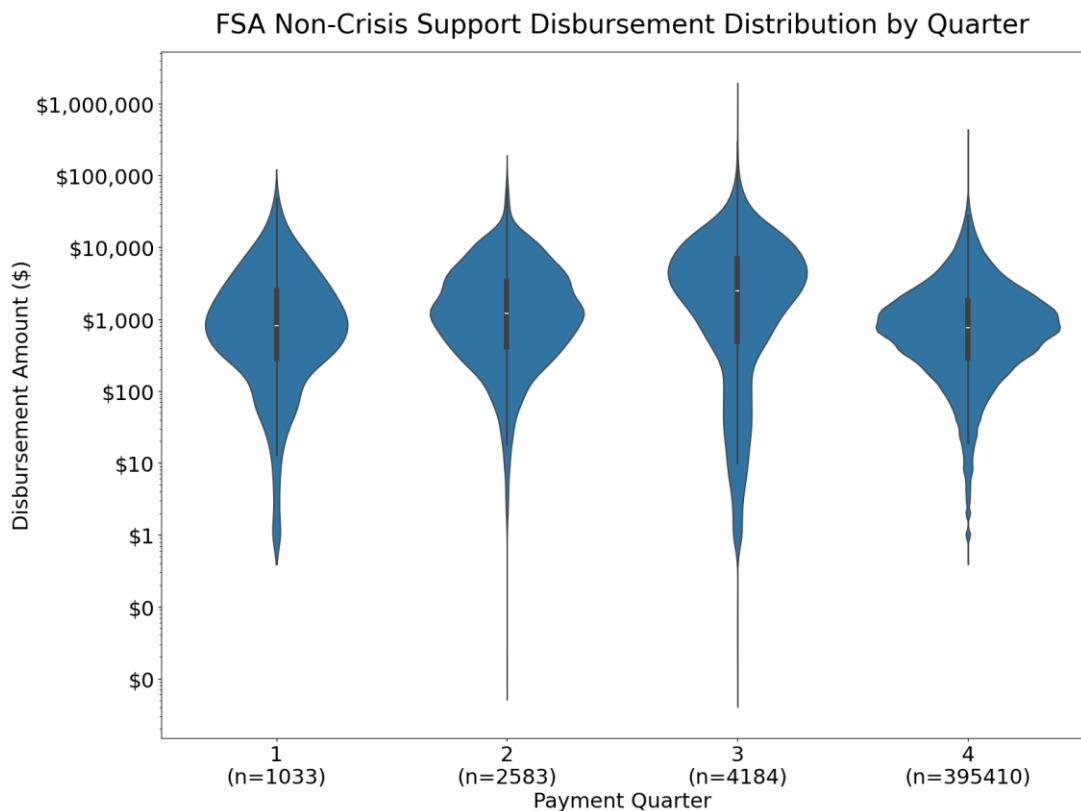
**Figure 2**

*Payment distribution plot for quartile 4. Note the change in x-axis scaling from dollars to millions of dollars.*



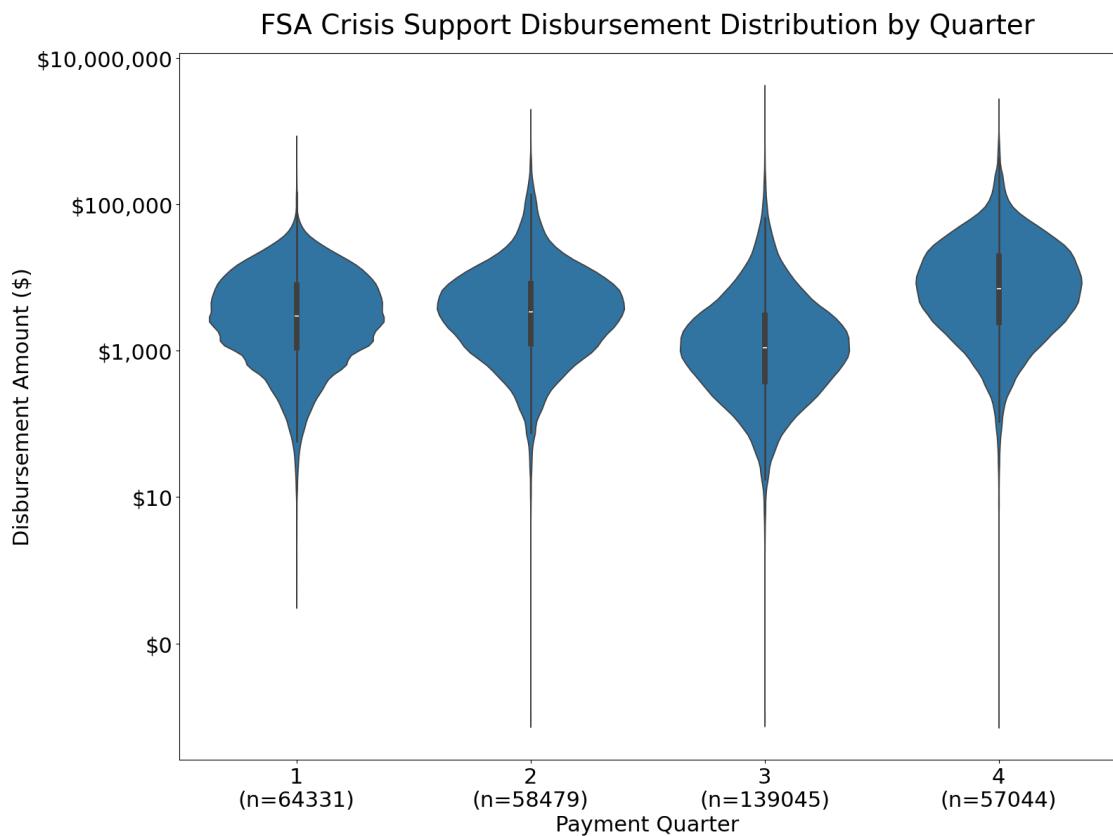
**Figure 3**

*FSA non-crisis support disbursement by yearly quarter where 1 = [Jan, Feb, Mar], 2 = [Apr, May, Jun], 3 = [Jul, Aug, Sep], 4 = [Oct, Nov, Dec]. The most variation in payments happens in Q3 while the most payments get distributed in Q4 after crop prices have been determined.*



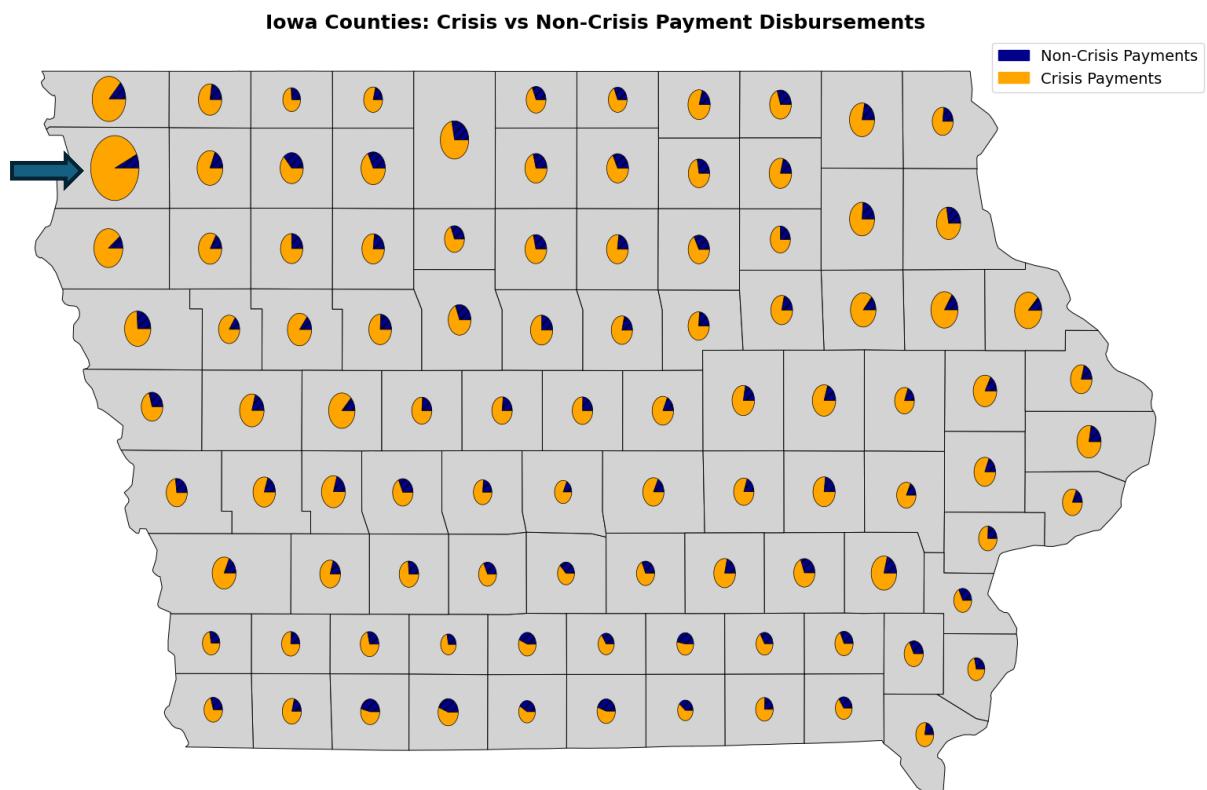
**Figure 4**

*FSA crisis support disbursement by yearly quarter where 1 = [Jan, Feb, Mar], 2 = [Apr, May, Jun], 3 = [Jul, Aug, Sep], 4 = [Oct, Nov, Dec]. Crisis support includes COVID and Trade War relief payments. The majority of payment distributions occurred in Q3.*



### Figure 5

This map displays Iowa counties with proportional pie charts representing FSA relief disbursements in 2020. Pie chart size corresponds to total disbursement amounts per county, with larger charts indicating higher funding levels. Color coding distinguishes payment types: orange represents crisis payments (COVID Relief and Trade War Relief programs), while dark blue represents non-crisis payments (all other FSA programs). The visualization reveals spatial patterns in both funding distribution and crisis payment proportions across Iowa's agricultural landscape. Sioux County, marked with an arrow, received four of the six individual payments exceeding \$1 million during this period.



**Table 1**

*Data Dictionary. Column names, description, and data type for variables included in the original Iowa 2020 FSA Distribution csv file downloaded from [here](#).*

Column Name	Description	Data Type
State FSA Code	State name coded to a value. Iowa = 19	Int
State FSA Name	Full name of the state (Iowa)	String
County FSA Code	Numeric code assigned to each county within the state	Int
County FSA Name	Full name of the county where the recipient is located	String
Formatted Payee Name	Name of the individual, entity, or organization receiving the payment	String
Address Information Line	Primary mailing address of the payee	String
Delivery Address Line	Secondary address information	String
City Name	City where the payee is located	String
State Abbreviation	Two-letter postal abbreviation for the state	String
Zip Code	Nine-digit ZIP+4 postal code	Int
Delivery Point Bar Code	USPS delivery point barcode	Float
Disbursement Amount	Dollar amount of FSA payment disbursed to the recipient	Float
Payment Date	Date and time when the payment was issued (MM/D/YYYY HH:MM format)	String
Accounting Program Code	Numeric code identifying the specific FSA program under which payment was made	Int
Accounting Program Description	Full name/description of the FSA program (e.g., Conservation Reserve Program, Direct Payments, etc.)	String
Accounting Program Year	Year when the FSA program was initiated/established (minimum value: 2004)	Float

**Table 2**

*Descriptive statistics for the Distribution Amount variable.*

Variable	Value
Number of Observations	722,109
Unique Payee Names	104,450
Sum	\$ 3,289,242,219.48
Mean	\$ 4,555.05
Standard Deviation	\$ 16,404.57
Min	\$ 0.01
25%	\$ 408.00
50%	\$ 1165.00
75%	\$ 3,409.00
Max	\$ 3,141,886.78
Number of Crisis Payment Observations	318,899
COVID Relief	\$ 2,136,004,257.01
Trade War Relief	\$ 397,404,485.45
Number of Normal Payment Observations	403,210
Normal Payment Sum	\$ 755,833,477.02

*Note.* Crisis Payment and Normal Payment are constructed variables and not part of the original dataset. COVID and Trade War Relief tags were given to observations based on FSA Program Names including CFAP (Coronavirus Food Assistance Program) or MFP (Market Facilitation Program).

**Table 3**

*Counts, sums, and means for the different payment types (non-crisis and crisis) calculated by yearly quarter where 1 = [Jan, Feb, Mar], 2 = [Apr, May, Jun], 3 = [Jul, Aug, Sep], 4 = [Oct, Nov, Dec].*

Payment	Non-Crisis Payments			Crisis Payments		
	Quarter	Count	Sum (\$)	Mean (\$)	Count	Sum (\$)
Q1	1033	2,556,764.40	2,475.09	64331	395,494,315.48	6,147.80
Q2	2583	7,579,357.15	2,934.32	58479	526,031,663.45	8,995.22
Q3	4184	25,123,090.50	6,004.56	139045	589,648,533.99	4,240.70
Q4	395410	720,574,264.97	1,822.35	57044	1,022,234,229.54	17,920.10