# THE ROLE OF U. S. SAFETY NET PROGRAMS IN INCENTIVIZING FARM GROWTH: A SIMULATION APPROACH

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**Abstract:**

*Safety net programs affect farm income and farmers ability to manage risk. Some economists argue that safety net programs benefit large farmers more and accelerate farm consolidation. The purpose of the paper is to test the hypothesis that the U.S. 2014 Farm Bill safety net programs are structurally biased to benefit large crop farms in the United States. A Monte Carlo simulation of 16 pairs of moderate and large farms in principal production regions of the U.S. are analyzed to estimate the $/hectare benefits of farm programs (ARC and PLC) and federal crop insurance. Results of the analysis suggest that for commercial size crop farms, safety net programs provide greater $/hectare benefits to moderate size farms compared to large farms. Additionally, the analysis showed that crop insurance programs are essentially neutral, providing about equal benefits to moderate and large scale crop farms.*

***Keywords:*** *farm programs, insurance, farm structure, simulation, and safety net*

## Introduction

Safety net programs affect farm income and the ability of farmers to manage risk. If these programs benefit large farms more than moderate and small farms, then safety net programs could change the future structure of agriculture by accelerating structural changes. The 2014 farm program provides income supports and risk management tools through two safety net programs Agricultural Risk Coverage (ARC) and Price Loss Coverage (PLC) and a subsidized insurance program. The PLC program provides payments based on historical production if the season average price falls below a reference price established by the Congress. The ARC program pays producers if county revenue falls below a benchmark defined as the moving average of historical revenue for the county. Both ARC and PLC make equal payments per hectare for all size farms suggesting no overt structural affects from these programs.

The impact of these programs is especially relevant as the E.U. begins the process of preparing for the next CAP reform. In 2016, a workshop entitled "Reflections on the agricultural challenges post-2020 in the EU: preparing the next CAP reform" organized by the European Parliament's Committee on Agriculture and Rural Development (COMAGRI) and its Policy Department (AGRI Research) researchers identified the U.S. safety net programs as one of three potential future structures for the next CAP reform (Matthews). In light of the interest in U.S. safety net programs and the E. U. desire to remain structurally neutral, a closer look at U.S. programs is warranted.

Federal crop insurance protects farm income from either yield losses or low revenue. Both insurance programs pay producers based on their individual losses and are not structurally biased towards small or large farms.

Despite the fact that insurance and the ARC and PLC programs are paid on a per hectare basis, these programs are thought to affect future farm structure in the United States (Mercier, Jolly, Hueth, and Ray and Schaffer).

The purpose of this paper is to test the hypothesis that the 2014 farm bill (ARC, PLC and insurance programs) are structurally biased to benefit large commercial crop farms in the United States.

## Methodology

Following the methodology suggested by Haen (1973) a systems simulation model is used to simulate representative crop farms under alternative policies. A farm level simulation model (FLIPSIM) is used to simulate representative crop farms in principal production regions with and without the 2014 ARC and PLC programs.[1] The model is also used to simulate the farms with and without crop insurance. The model has been used extensively to analyze the farm level impacts of alternative safety net programs (Richardson and Nixon, 1981 and 1986; Richardson et al., 1982a, 1982b, 1983, 1984, 2013, and 2016; Adams and Richardson, 2001; and Knutson et al., 1998).

FLIPSIM is a Monte Carlo simulation model that simulates the annual production, marketing, farm program, insurance, financial, and income tax functions of a farm. The model generates stochastic yields using a multivariate empirical (MVE) distribution (see Richardson, Klose, and Gray, 2000 for details). Stochastic national crop prices come from the December 2016 FAPRI Baseline and are localized to the representative farm using historical basis wedges for the farm's location and marketing procedures. The model is simulated for eight years recursively and the planning horizon is repeated for 500 iterations.

[1] FLIPSIM was developed by Richardson and Nixon (1981 and 1986) and has been updated annually for farm policy and income tax changes.

For each iteration, a separate sample of random yields are drawn from the MVE distribution and the FAPRI stochastic prices. The MVE procedure insures that the historical correlation of yields among the farm's crops is maintained. The stochastic national prices from FAPRI are correlated temporally because they are the product of a multi-sector agricultural model that incorporates the unexplained risk for the econometric equations, i.e., the OLS residuals.

**Data**

Data to simulate representative crop farms comes from the Texas A&M University Agricultural and Food Policy Center (AFPC) data base of crop farms in 29 states. AFPC maintains a data base for simulating representative farms that are updated every 2 to 3 years using interviews with actual producers (Richardson, et al., 2016). The producer panels are interviewed in a modified Delphi process where each of the 4 to 6 producers present their costs, yields, prices, and assets and the panel arrives at a consensus to develop a virtual farm that represents the panel. The interview process has been used since 1985 with most of the original panels still engaged in the updates. Many of the retiring panel farmers are now represented by their sons and daughters.

Actual yield histories for the producers are obtained and used in the FLIPSIM to model yield risks. Pricing history and marketing methods are captured in the panel interviews to relate national crop prices to the local markets. Farm program participation decisions for the representative farms come from the producer panels as well as their historical base hectares and payment yields for each crop.

For this study 32 of the AFPC representative farms were selected. The farms were picked because both a moderate size and a large farm are available in each region. The characteristics for the 32 farms are summarized in Table 1. Further details for these farms are available in Appendix A of Richardson, et al., 2016. The farms are simulated for a base case:

- Participation in the 2014 ARC or PLC provisions, as specified by the farm panels, and
- Participation in the federal crop insurance program, either yield or revenue protection using the coverage levels specified by the farm panel for each crop.

The No Program option assumes the farms do not participate in the ARC or PLC programs but purchase federal crop insurance. The No Insurance scenario assumes the farms participate in the 2014 ARC or PLC programs but do not purchase crop insurance.

The Food and Agricultural Policy Research Institute (FAPRI) 2016 December

Baseline provides a 10 year outlook of crop and livestock prices. The baseline projections on their website shows the season average prices for the crops. The averages they present come from simulating 500 random draws of residuals from the econometric equations in a sector level model of U.S. and world agriculture. The 500 random prices for 2016-2021 are used in FLIPSIM to incorporate the stochastic nature of crop prices. A summary of the stochastic crop prices used for this paper is provided in Table 2.

Tables follow.

**Table 1. Characterisitcs of the Representative Crop Farms (Hectares).**

| **Feedgrain farms** | **IAG544** | **IAG1371** | **NEG968** | **NEG1734** | **NDG1210** | **NDG3226** | **ING403** | **ING887** |
|---|---|---|---|---|---|---|---|---|
| Region | Northwest Iowa | | Southern Nebraska | | Southern North Dakota | | Central Indiana | |
| County | Webster | Webster | Dawson | Dawson | Barnes | Barnes | Shelby | Shelby |
| Total Cropland | 544 | 1,371 | 968 | 1,734 | 1,210 | 3,226 | 403 | 887 |
| Hectares Owned | 117 | 444 | 242 | 867 | 290 | 1,613 | 121 | 310 |
| Hectares Leased | 427 | 927 | 726 | 867 | 919 | 1,613 | 282 | 577 |
| 2015 Planted Hectares | | | | | | | | |
| Total | 544 | 1,371 | 968 | 1,734 | 1,250 | 3,226 | 403 | 887 |
| Corn | 355 | 754 | 645 | 1,210 | 403 | 1,210 | 202 | 444 |
| Wheat | 0 | 0 | 0 | 0 | 202 | 605 | 0 | 0 |
| Soybeans | 190 | 617 | 323 | 403 | 605 | 1,210 | 202 | 444 |
| Hay | 0 | 0 | 0 | 121 | 0 | 0 | 0 | 0 |

| **Feedgrain farms** | **MOCG927** | **MOCG1694** | **TNG363** | **TNG887** | **TXNP1391** | **TXNP4290** |
|---|---|---|---|---|---|---|
| Region | Central Missouri | | Western Tennessee | | Texas Northern Plains | |
| County | Carroll | Carroll | Henry | Henry | Moore | Moore |
| Total Cropland | 927 | 1,694 | 363 | 887 | 1,391 | 4,290 |
| Hectares Owned | 556 | 726 | 60 | 222 | 1,044 | 1,416 |
| Hectares Leased | 371 | 968 | 302 | 665 | 347 | 2,875 |
| 2015 Planted Hectares | | | | | | |
| Total | 927 | 1,694 | 403 | 1,008 | 1,252 | 4,004 |
| Corn | 464 | 931 | 202 | 444 | 577 | 1,613 |
| Wheat | 0 | 0 | 40 | 121 | 472 | 288 |
| Soybeans | 464 | 762 | 161 | 444 | 0 | 0 |
| Sorghum | 0 | 0 | 0 | 0 | 139 | 849 |
| Cotton | 0 | 0 | 0 | 0 | 65 | 1,255 |

| **Wheat farms** | **WAW806** | **WAW3226** | **COW1210** | **COW2274** | **KSCW806** | **KSCW2137** | **KSNW1613** | **KSNW2411** |
|---|---|---|---|---|---|---|---|---|
| Region | Southeastern Washington | | Eastern Colorado | | Central Kansas | | Northwestern Kansas | |
| County | Whitman | Whitman | Washington | Washington | Sumner | Sumner | Thomas | Thomas |
| Total Cropland | 806 | 3,226 | 1,210 | 2,274 | 806 | 2,137 | 1,613 | 2,411 |
| Hectares Owned | 323 | 931 | 847 | 758 | 282 | 534 | 472 | 726 |
| Hectares Leased | 484 | 2,294 | 363 | 1,516 | 524 | 1,603 | 1,141 | 1,685 |
| 2015 Planted Hectares | | | | | | | | |
| Total | 806 | 3,065 | 801 | 1,585 | 806 | 2,137 | 1,210 | 2,008 |
| Wheat | 532 | 1,996 | 408 | 766 | 403 | 1,389 | 605 | 734 |
| Grain Sorghum | 0 | 0 | 0 | 0 | 134 | 107 | 202 | 298 |
| Barley | 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn | 0 | 0 | 272 | 359 | 134 | 321 | 403 | 923 |
| Soybeans | 0 | 0 | 0 | 0 | 135 | 321 | 0 | 52 |
| Dry Peas | 218 | 968 | 0 | 0 | 0 | 0 | 0 | 0 |
| Millet | 0 | 0 | 0 | 359 | 0 | 0 | 0 | 0 |
| CRP | 0 | 101 | 121 | 101 | 0 | 0 | 0 | 0 |

| **Cotton Farms** | **TXSP1008** | **TXSP1815** | **TXCB1210** | **TXCB3710** | **TNC1008** | **TNC1633** |
|---|---|---|---|---|---|---|
| Region | Texas Southern Plains | | Texas Coastal Bend | | Western Tennessee | |
| County | Dawson | Dawson | San Patricio | Nueces | Fayette | Haywood |
| Total Cropland | 1,008 | 1,815 | 1,210 | 3,710 | 1,008 | 1,633 |
| Hectares Owned | 202 | 363 | 242 | 371 | 101 | 403 |
| Hectares Leased | 806 | 1,452 | 968 | 3,339 | 907 | 1,230 |
| 2015 Planted Hectares | | | | | | |
| Total | 1,008 | 1,680 | 1,210 | 3,710 | 919 | 1,825 |
| Cotton | 523 | 1,632 | 544 | 1,484 | 101 | 817 |
| Grain Sorghum | 202 | 0 | 605 | 1,484 | 101 | 0 |
| Wheat | 0 | 48 | 0 | 0 | 0 | 192 |
| Corn | 0 | 0 | 60 | 742 | 202 | 242 |
| Soybeans | 0 | 0 | 0 | 0 | 504 | 575 |
| Peanuts | 283 | 0 | 0 | 0 | 0 | 0 |
| CRP | 0 | 0 | 0 | 0 | 12 | 0 |

| **Rice Farms** | **CAR222** | **CAR1210** | **TXR605** | **TXR1210** |
|---|---|---|---|---|
| Region | California | | Texas Upper Gulf Coast | |
| County | Sutter | Sutter | Colorado | Colorado |
| Total Cropland | 222 | 1,210 | 605 | 1,210 |
| Hectares Owned | 111 | 310 | 163 | 0 |
| Hectares Leased | 111 | 900 | 442 | 1,210 |
| 2015 Planted Hectares | | | | |
| Total | 202 | 1,210 | 242 | 605 |
| Rice | 202 | 1,210 | 242 | 605 |

Source: Texas A&M University Agricultural and Food Policy Center Representative Farms Data

| Table 2. Summary Statistics for Crop Prices, 2016-2021. | | | | | | |
|---|---|---|---|---|---|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| | ($/Metric Ton) | | | | | |
| **Corn** | | | | | | |
| Mean | 130.35 | 142.53 | 149.89 | 151.88 | 151.65 | 151.11 |
| Std Dev | 27.62 | 33.79 | 35.64 | 39.03 | 35.53 | 37.15 |
| Coef Variation | 834.03 | 932.95 | 935.69 | 1011.35 | 922.18 | 967.55 |
| Minimum | 57.16 | 66.15 | 80.86 | 61.53 | 76.29 | 57.11 |
| Maximum | 279.81 | 298.09 | 277.78 | 440.71 | 294.67 | 354.80 |
| | | | | | | |
| **Soybeans** | | | | | | |
| Mean | 369.73 | 370.79 | 382.03 | 388.87 | 384.03 | 381.58 |
| Std Dev | 80.80 | 87.42 | 93.35 | 100.11 | 89.03 | 95.13 |
| Coef Variation | 860.13 | 927.95 | 961.68 | 1013.16 | 912.39 | 981.17 |
| Minimum | 171.05 | 165.08 | 170.05 | 156.66 | 140.23 | 177.08 |
| Maximum | 620.11 | 678.04 | 692.20 | 854.49 | 686.09 | 741.74 |
| | | | | | | |
| **Wheat** | | | | | | |
| Mean | 146.93 | 175.96 | 192.80 | 200.22 | 205.71 | 205.55 |
| Std Dev | 26.49 | 41.29 | 47.66 | 49.05 | 46.49 | 46.75 |
| Coef Variation | 709.65 | 923.62 | 972.84 | 964.13 | 889.45 | 895.09 |
| Minimum | 87.01 | 59.11 | 84.29 | 84.66 | 85.34 | 67.09 |
| Maximum | 245.47 | 308.14 | 359.86 | 406.42 | 383.17 | 354.78 |
| | | | | | | |
| **Sorghum** | | | | | | |
| Mean | 116.78 | 129.43 | 134.09 | 136.20 | 137.21 | 137.76 |
| Std Dev | 27.59 | 32.38 | 35.02 | 36.23 | 33.87 | 36.06 |
| Coef Variation | 929.75 | 984.61 | 1027.72 | 1046.76 | 971.62 | 1030.20 |
| Minimum | 22.30 | 31.16 | 57.33 | 52.50 | 44.00 | 53.84 |
| Maximum | 239.85 | 266.29 | 254.11 | 340.35 | 245.56 | 321.23 |
| | | | | | | |
| **Rice** | | | | | | |
| Mean | 231.95 | 243.36 | 252.98 | 254.99 | 258.19 | 262.81 |
| Std Dev | 27.99 | 31.28 | 30.59 | 33.62 | 32.60 | 33.31 |
| Coef Variation | 265.97 | 283.25 | 266.51 | 290.59 | 278.26 | 279.35 |
| Minimum | 154.06 | 153.80 | 141.18 | 159.42 | 163.43 | 161.28 |
| Maximum | 311.52 | 318.54 | 327.83 | 340.70 | 355.09 | 368.22 |
| | | | | | | |
| **Cotton** | | | | | | |
| Mean | 1424.60 | 1383.56 | 1348.43 | 1368.54 | 1370.54 | 1377.29 |
| Std Dev | 232.91 | 244.12 | 240.23 | 233.59 | 238.06 | 239.37 |
| Coef Variation | 1401.19 | 1359.02 | 1324.28 | 1345.06 | 1346.60 | 1353.23 |
| Minimum | 1448.02 | 1408.11 | 1372.58 | 1392.03 | 1394.47 | 1401.36 |
| Maximum | 36032.74 | 38888.54 | 39266.21 | 37619.61 | 38283.53 | 38304.39 |
| | | | | | | |
| **Peanuts** | | | | | | |
| Mean | 421.08 | 402.42 | 398.36 | 398.59 | 399.58 | 400.41 |
| Std Dev | 55.53 | 61.16 | 66.72 | 71.54 | 70.77 | 73.86 |
| Coef Variation | 14.53 | 16.75 | 18.46 | 19.78 | 19.52 | 20.33 |
| Minimum | 308.36 | 286.49 | 278.29 | 277.95 | 278.40 | 252.44 |
| Maximum | 687.35 | 785.18 | 738.79 | 723.56 | 705.31 | 778.49 |
| Source: FAPRI. https://www.fapri.missouri.edu/publications/outlook/ | | | | | | |

## Results

The results from simulating the 32 representative crop farms are summarized in Table 3. Sixteen production regions have a pair of farms that represent moderate and large farms in the county. The Base scenario assumes the farms participate in the safety net program of choice (ARC or PLC) and the crop insurance choice the farms specified (revenue or yield protection). The No Program scenario assumes the farm does not receive ARC or PLC payments, but participates in crop insurance. The No insurance scenario assumes the farm does not purchase crop insurance but is eligible for ARC and PLC payments.

The key output variables (KOVs) from FLIPSIM in Table 1 are: total annual cash receipts (2016-2021), annual government payments (2016-2021), annual crop insurance indemnities (2016-2021), annual net cash farm income (2016-2021), ending cash reserves in 2021, and nominal net worth in 2021. Average values calculated over the 500 draws are reported for each KOV. The change in total payments and the per hectare change in payments from the Base are reported for government payments, insurance indemnities, net cash farm income, and ending cash reserves.

### Farm Programs

The moderate and large size Iowa corn and soybean farms have 544 and 1371 hectares. The moderate size farm receives an average government payment of $27,800/year and the large farm receives $63,400/year. Putting these payments on a dollar per hectare basis, the moderate farm receives $51.10/ hectare and the large farm receives $46.20/ hectare so the farm program is not structurally biased towards the large Iowa farm. Similar results are observed for the crop insurance program which provides a $30.30/ hectare average indemnity for the moderate Iowa farm and $26.70/ hectare for the large farm. Net cash farm incomes decline more from a loss in government programs than from a loss of crop insurance. Again the loss in net cash income per hectare is greater for the moderate size farm than the large Iowa farm ($68.60/ hectare vs. $56.30/ hectare for government payments and $21.10/ hectare vs. $18.00/ hectare for insurance). If the farm program or insurance is structurally biased towards large farms the dollar per hectare loss of ending cash reserves in 2021 will be greater for the large farm than the moderate farm. The results for the Iowa farms are just the opposite because the loss of farm programs reduces ending cash more for the moderate than the large farm ($541.70/ hectare vs. $435.20/ hectare). A similar result is

**Table 3. Comparison of Farm Program and Crop Insurance Impacts on Moderate and Large Representative Crop Farms in the United States.**

| **Iowa Grain Farm** | **IAG544** | **IAG544** | **IAG544** | **IAG1371** | **IAG1371** | **IAG1371** |
|---|---|---|---|---|---|---|
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 27.8 | - | 27.8 | 63.4 | - | 63.4 |
| Change ($1000) | | (27.8) | | | (63.4) | |
| Change ($/hectare) | | (51.1) | | | (46.2) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 16.5 | 16.5 | - | 36.6 | 36.6 | - |
| Change ($1000) | | | (16.5) | | | (36.6) |
| Change ($/hectare) | | | (30.3) | | | (26.7) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | (38.7) | (76.0) | (50.2) | 404.9 | 327.6 | 380.3 |
| Change ($1000) | | (37.3) | (11.5) | | (77.2) | (24.6) |
| Change ($/hectare) | | (68.6) | (21.1) | | (56.3) | (18.0) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (1,350.4) | (1,645.0) | (1,407.4) | 415.5 | (181.2) | 295.9 |
| Change ($1000) | | (294.7) | (57.1) | | (596.7) | (119.6) |
| Change ($/hectare) | | (541.7) | (104.9) | | (435.2) | (87.2) |
| | | | | | | |
| **Nebraska Grain Farm** | **NEG968** | **NEG968** | **NEG968** | **NEG1734** | **NEG1734** | **NEG1734** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 66.0 | - | 66.0 | 113.2 | - | 113.0 |
| Change ($1000) | | (66.0) | | | (113.2) | (0.2) |
| Change ($/hectare) | | (68.2) | | | (65.3) | (0.1) |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 24.9 | 24.9 | - | 45.8 | 45.8 | - |
| Change ($1000) | | | (24.9) | | | (45.8) |
| Change ($/hectare) | | | (25.7) | | | (26.4) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 466.1 | 393.2 | 467.2 | 799.9 | 670.3 | 822.0 |
| Change ($1000) | | (72.9) | 1.1 | | (129.6) | 22.1 |
| Change ($/hectare) | | (75.3) | 1.2 | | (74.7) | 12.7 |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 2,019.8 | 1,486.8 | 2,053.6 | 2,488.3 | 1,469.8 | 2,730.6 |
| Change ($1000) | | (533.0) | 33.8 | | (1,018.5) | 242.2 |
| Change ($/hectare) | | (550.6) | 34.9 | | (587.4) | 139.7 |
| | | | | | | |
| **Missouri Grain Farm** | **MOCG927** | **MOCG927** | **MOCG927** | **MOCG1694** | **MOCG1694** | **MOCG1694** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 53.6 | - | 53.6 | 55.4 | - | 55.4 |
| Change ($1000) | | (53.6) | | | (55.4) | |
| Change ($/hectare) | | (57.8) | | | (32.7) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 17.5 | 17.5 | - | 23.5 | 23.5 | - |
| Change ($1000) | | | (17.5) | | | (23.5) |
| Change ($/hectare) | | | (18.8) | | | (13.9) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 694.5 | 637.8 | 689.2 | 1,343.8 | 1,287.8 | 1,343.8 |
| Change ($1000) | | (56.7) | (5.3) | | (56.1) | - |
| Change ($/hectare) | | (61.2) | (5.7) | | (33.1) | - |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 949.2 | 676.0 | 939.8 | 3,716.0 | 3,377.4 | 3,745.9 |
| Change ($1000) | | (273.1) | (9.3) | | (338.5) | 29.9 |
| Change ($/hectare) | | (294.6) | (10.1) | | (199.8) | 17.6 |

| **Table 3. Continued.** | | | | | | |
|---|---|---|---|---|---|---|
| **Indiana Grain Farm** | **ING403** | **ING403** | **ING403** | **ING887** | **ING887** | **ING887** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 28.5 | - | 28.5 | 65.0 | - | 65.0 |
| Change ($1000) | | (28.5) | | | (65.0) | |
| Change ($/hectare) | | (70.7) | | | (73.3) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 7.7 | 7.7 | - | 18.5 | 18.5 | - |
| Change ($1000) | | | (7.7) | | | (18.5) |
| Change ($/hectare) | | | (19.1) | | | (20.8) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 208.6 | 177.4 | 209.9 | 298.9 | 224.1 | 292.1 |
| Change ($1000) | | (31.2) | 1.3 | | (74.8) | (6.9) |
| Change ($/hectare) | | (77.4) | 3.3 | | (84.3) | (7.8) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (38.7) | (170.8) | (19.6) | (951.1) | (1,406.6) | (973.7) |
| Change ($1000) | | (132.1) | 19.1 | | (455.5) | (22.7) |
| Change ($/hectare) | | (327.7) | 47.3 | | (513.6) | (25.5) |
| | | | | | | |
| **North Dakota Grain Farm** | **NDG1210** | **NDG1210** | **NDG1210** | **NDG3226** | **NDG3226** | **NDG3226** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 48.1 | - | 48.1 | 105.7 | - | 105.7 |
| Change ($1000) | | (48.1) | | | (105.7) | |
| Change ($/hectare) | | (39.7) | | | (32.8) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 18.1 | 18.1 | - | 50.8 | 50.8 | - |
| Change ($1000) | | | (18.1) | | | (50.8) |
| Change ($/hectare) | | | (15.0) | | | (15.7) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 191.9 | 133.7 | 195.9 | 951.0 | 826.4 | 965.4 |
| Change ($1000) | | (58.2) | 4.0 | | (124.6) | 14.4 |
| Change ($/hectare) | | (48.1) | 3.3 | | (38.6) | 4.5 |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (294.8) | (701.8) | (231.3) | 723.2 | (157.8) | 928.8 |
| Change ($1000) | | (407.0) | 63.5 | | (880.9) | 205.7 |
| Change ($/hectare) | | (336.4) | 52.5 | | (273.1) | 63.7 |
| | | | | | | |
| **Tennessee Grain Farm** | **TNG363** | **TNG363** | **TNG363** | **TNG887** | **TNG887** | **TNG887** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 12.2 | - | 12.2 | 38.6 | - | 38.6 |
| Change ($1000) | | (12.2) | | | (38.6) | |
| Change ($/hectare) | | (33.5) | | | (43.5) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 5.7 | 5.7 | - | 12.6 | 12.6 | - |
| Change ($1000) | | | (5.7) | | | (12.6) |
| Change ($/hectare) | | | (15.8) | | | (14.2) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 108.7 | 91.1 | 108.9 | 198.2 | 146.9 | 198.0 |
| Change ($1000) | | (17.6) | 0.2 | | (51.3) | (0.2) |
| Change ($/hectare) | | (48.5) | 0.6 | | (57.9) | (0.2) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (484.7) | (616.7) | (472.5) | (1,144.2) | (1,527.1) | (1,121.9) |
| Change ($1000) | | (132.0) | 12.2 | | (382.8) | 22.3 |
| Change ($/hectare) | | (363.6) | 33.6 | | (431.6) | 25.2 |

| Table 3. Continued | | | | | | |
|---|---|---|---|---|---|---|
| **Texas Grain Farm** | **TXNP1391** | **TXNP1391** | **TXNP1391** | **TXNP3226** | **TXNP3226** | **TXNP3226** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 132.2 | - | 132.2 | 361.4 | - | 361.4 |
| Change ($1000) | | (132.2) | | | (361.4) | |
| Change ($/hectare) | | (95.0) | | | (112.0) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 29.6 | 29.6 | - | 211.4 | 211.4 | - |
| Change ($1000) | | | (29.6) | | | (211.4) |
| Change ($/hectare) | | | (21.3) | | | (65.5) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 840.6 | 705.8 | 863.3 | 1,772.6 | 1,381.9 | 1,683.3 |
| Change ($1000) | | (134.8) | 22.7 | | (390.7) | (89.3) |
| Change ($/hectare) | | (96.9) | 16.3 | | (121.1) | (27.7) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 3,430.4 | 2,760.1 | 3,506.0 | 7,157.6 | 4,690.2 | 6,765.5 |
| Change ($1000) | | (670.4) | 75.6 | | (2,467.5) | (392.2) |
| Change ($/hectare) | | (481.9) | 54.3 | | (764.9) | (121.6) |
| | | | | | | |
| **Washington Wheat Farm** | **WAW806** | **WAW806** | **WAW806** | **WAW3226** | **WAW3226** | **WAW3226** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 35.4 | - | 35.4 | 133.1 | - | 133.1 |
| Change ($1000) | | (35.4) | | | (133.1) | |
| Change ($/hectare) | | (43.9) | | | (41.3) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 5.6 | 5.6 | - | 23.1 | 23.1 | - |
| Change ($1000) | | | (5.6) | | | (23.1) |
| Change ($/hectare) | | | (6.9) | | | (7.1) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 279.8 | 242.7 | 280.7 | 446.9 | 293.0 | 451.3 |
| Change ($1000) | | (37.1) | 0.9 | | (153.9) | 4.4 |
| Change ($/hectare) | | (46.1) | 1.1 | | (47.7) | 1.4 |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 659.1 | 483.0 | 664.0 | (1,318.2) | (2,242.0) | (1,275.8) |
| Change ($1000) | | (176.1) | 4.9 | | (923.8) | 42.4 |
| Change ($/hectare) | | (218.5) | 6.1 | | (286.3) | 13.1 |
| | | | | | | |
| **Colorado Wheat Farm** | **COW1210** | **COW1210** | **COW1210** | **COW2274** | **COW2274** | **COW2274** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 31.0 | - | 31.0 | 63.5 | - | 63.5 |
| Change ($1000) | | (31.0) | | | (63.5) | |
| Change ($/hectare) | | (25.6) | | | (27.9) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 5.1 | 5.1 | - | 5.5 | 5.5 | - |
| Change ($1000) | | | (5.1) | | | (5.5) |
| Change ($/hectare) | | | (4.2) | | | (2.4) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 103.1 | 67.3 | 103.8 | 80.8 | 1.5 | 87.0 |
| Change ($1000) | | (35.8) | 0.7 | | (79.4) | 6.2 |
| Change ($/hectare) | | (29.6) | 0.5 | | (34.9) | 2.7 |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (256.2) | (396.9) | (244.6) | (1,278.7) | (1,755.0) | (1,221.4) |
| Change ($1000) | | (140.6) | 11.7 | | (476.3) | 57.3 |
| Change ($/hectare) | | (116.2) | 9.6 | | (209.5) | 25.2 |

| **Table 3. Continued** | | | | | | |
|---|---|---|---|---|---|---|
| **Kansas Wheat Farm** | **KSNW1613** | **KSNW1613** | **KSNW1613** | **KSNW2411** | **KSNW2411** | **KSNW2411** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 74.1 | - | 74.1 | 104.1 | - | 104.1 |
| Change ($1000) | | (74.1) | | | (104.1) | |
| Change ($/hectare) | | (45.9) | | | (43.2) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 11.3 | 11.3 | - | 19.6 | 19.6 | - |
| Change ($1000) | | | (11.3) | | | (19.6) |
| Change ($/hectare) | | | (7.0) | | | (8.1) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 145.0 | 58.0 | 180.7 | 18.8 | (105.7) | 80.2 |
| Change ($1000) | | (87.0) | 35.7 | | (124.5) | 61.4 |
| Change ($/hectare) | | (53.9) | 22.1 | | (51.6) | 25.5 |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (684.2) | (1,212.5) | (388.4) | (2,825.3) | (3,601.1) | (2,316.3) |
| Change ($1000) | | (528.3) | 295.9 | | (775.9) | 509.0 |
| Change ($/hectare) | | (327.5) | 183.4 | | (321.8) | 211.1 |
| | | | | | | |
| **Kansas Wheat Farm** | **KSCW806** | **KSCW806** | **KSCW806** | **KSCW2137** | **KSCW2137** | **KSCW2137** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 20.8 | - | 20.8 | 56.6 | - | 56.6 |
| Change ($1000) | | (20.8) | | | (56.6) | |
| Change ($/hectare) | | (25.7) | | | (26.5) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 6.6 | 6.6 | - | 16.5 | 16.5 | - |
| Change ($1000) | | | (6.6) | | | (16.5) |
| Change ($/hectare) | | | (8.1) | | | (7.7) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 77.0 | 50.8 | 89.5 | 338.7 | 277.0 | 362.9 |
| Change ($1000) | | (26.1) | 38.7 | | (61.7) | 85.9 |
| Change ($/hectare) | | (32.4) | 48.0 | | (28.9) | 40.2 |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (637.5) | (819.9) | (576.0) | 703.9 | 283.8 | 709.1 |
| Change ($1000) | | (182.4) | 61.5 | | (420.0) | 5.2 |
| Change ($/hectare) | | (226.3) | 76.3 | | (196.6) | 2.4 |
| | | | | | | |
| **Texas Cotton Farm** | **TXSP1008** | **TXSP1008** | **TXSP1008** | **TXSP1815** | **TXSP1815** | **TXSP1815** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 199.3 | - | 199.3 | 155.5 | - | 155.5 |
| Change ($1000) | | (199.3) | | | (155.5) | |
| Change ($/hectare) | | (197.7) | | | (85.7) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 44.2 | 44.2 | - | 98.6 | 98.6 | - |
| Change ($1000) | | | (44.2) | | | (98.6) |
| Change ($/hectare) | | | (43.8) | | | (54.3) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 253.6 | 19.6 | 219.1 | 491.5 | 314.1 | 418.6 |
| Change ($1000) | | (234.1) | (34.5) | | (177.4) | (72.9) |
| Change ($/hectare) | | (232.2) | (34.3) | | (97.7) | (40.2) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 286.7 | (1,193.0) | 105.3 | 888.6 | (312.2) | 486.7 |
| Change ($1000) | | (1,479.7) | (181.5) | | (1,200.8) | (402.0) |
| Change ($/hectare) | | (1,467.9) | (180.0) | | (661.6) | (221.5) |

| Table 3. Continued | | | | | | |
|---|---|---|---|---|---|---|
| **Texas Cotton Farm** | **TXCB1210** | **TXCB1210** | **TXCB1210** | **TXCB3710** | **TXCB3710** | **TXCB3710** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 116.53 | 0 | 116.53 | 362.54 | 0 | 362.54 |
| Change ($1000) | | (116.5) | | | (362.5) | |
| Change ($/hectare) | | (96.3) | | | (97.7) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 55.05 | 55.05 | 0 | 131.3 | 131.3 | 0 |
| Change ($1000) | | | (55.1) | | | (131.3) |
| Change ($/hectare) | | | (45.5) | | | (35.4) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 72.81 | -138.08 | 56.66 | 329.94 | -245.29 | 318.32 |
| Change ($1000) | | (210.9) | (16.2) | | (575.2) | (11.6) |
| Change ($/hectare) | | (174.3) | (13.3) | | (155.0) | (3.1) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | -869.35 | -2219.51 | -915.74 | -584.69 | -4295.44 | -471.64 |
| Change ($1000) | | (1,350.2) | (46.4) | | (3,710.8) | 113.1 |
| Change ($/hectare) | | (1,115.8) | (38.3) | | (1,000.2) | 30.5 |
| | | | | | | |
| **Tennessee Cotton Farm** | **TNC1008** | **TNC1008** | **TNC1008** | **TNC1633** | **TNC1633** | **TNC1633** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 45.3 | - | 45.3 | 172.3 | - | 172.3 |
| Change ($1000) | | (45.3) | | | (172.3) | |
| Change ($/hectare) | | (44.9) | | | (105.5) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 17.5 | 17.5 | - | 56.2 | 56.2 | - |
| Change ($1000) | | | (17.5) | | | (56.2) |
| Change ($/hectare) | | | (17.3) | | | (34.4) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 367.1 | 311.8 | 367.4 | 366.6 | 63.4 | 332.9 |
| Change ($1000) | | (55.3) | 0.3 | | (303.2) | (33.7) |
| Change ($/hectare) | | (54.8) | 0.3 | | (185.6) | (20.6) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 2,299.6 | 1,999.0 | 2,325.3 | 1,120.9 | (887.1) | 927.9 |
| Change ($1000) | | (300.6) | 25.7 | | (2,008.0) | (193.0) |
| Change ($/hectare) | | (298.2) | 25.5 | | (1,229.6) | (118.2) |
| | | | | | | |
| **California Rice Farm** | **CAR222** | **CAR222** | **CAR222** | **CAR1210** | **CAR1210** | **CAR1210** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 74.1 | - | 74.1 | 361.9 | - | 361.9 |
| Change ($1000) | | (74.1) | | | (361.9) | |
| Change ($/hectare) | | (333.6) | | | (299.1) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 5.7 | 5.7 | - | - | - | - |
| Change ($1000) | | | (5.7) | | | - |
| Change ($/hectare) | | | (25.5) | | | - |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 71.9 | (19.6) | 68.0 | 421.2 | 21.7 | 421.2 |
| Change ($1000) | | (91.5) | (4.0) | | (399.5) | - |
| Change ($/hectare) | | (412.1) | (17.9) | | (330.1) | - |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | (968.6) | (1,534.5) | (987.7) | (196.1) | (2,722.6) | (196.1) |
| Change ($1000) | | (565.9) | (19.1) | | (2,526.5) | - |
| Change ($/hectare) | | (2,549.1) | (86.0) | | (2,088.0) | - |

| **Table 3. Continued** | | | | | | |
|---|---|---|---|---|---|---|
| **Texas Rice Farm** | **TXR605** | **TXR605** | **TXR605** | **TXR1210** | **TXR1210** | **TXR1210** |
| | **BASE** | **NO PROG** | **NOINSR** | **BASE** | **NO PROG** | **NOINSR** |
| Government Payments | | | | | | |
| 2016-2021 Average ($1000) | 127.4 | - | 127.4 | 208.1 | - | 208.1 |
| Change ($1000) | | (127.4) | | | (208.1) | |
| Change ($/hectare) | | (210.6) | | | (172.0) | |
| | | | | | | |
| Crop Insurance Indemnities | | | | | | |
| 2016-2021 Average ($1000) | 8.3 | 8.3 | - | 18.2 | 18.2 | - |
| Change ($1000) | | | (8.3) | | | (18.2) |
| Change ($/hectare) | | | (13.8) | | | (15.0) |
| | | | | | | |
| Net Cash Farm Income | | | | | | |
| 2016-2021 Average ($1000) | 212.6 | 72.2 | 205.5 | 262.1 | 27.7 | 247.0 |
| Change ($1000) | | (140.4) | (7.1) | | (234.4) | (15.2) |
| Change ($/hectare) | | (232.0) | (11.8) | | (193.7) | (12.5) |
| | | | | | | |
| Ending Cash Reserves | | | | | | |
| 2021 Average ($1000) | 205.5 | (672.2) | 167.9 | 378.0 | (1,082.7) | 297.1 |
| Change ($1000) | | (877.7) | (37.6) | | (1,460.7) | (80.9) |
| Change ($/hectare) | | (1,450.8) | (62.2) | | (1,207.2) | (66.8) |

observed for the impact of crop insurance. The results for the Iowa farms are particularly important because both farms purchase the same type and level of crop insurance and both farms elected the ARC-county farm program.

The per hectare farm program payments for the 32 representative farms can be summarized as follows:

- Nine of the 16 moderate size farms receive greater per hectare payments than the large farms in the same county.
- Four of the seven large farms who's per hectare payments exceed their moderate size neighbor's payments were only $2.60/ hectare or less greater than the moderate farm (ING887, TXCB3710, KSCW2137, and COW2274).
- Only three of the large farms (TXNP3226, TNG887, and TNG1633) receive payments more than $10/hectare than their moderate size neighbors.

The three large farms that receive larger per hectare government payments than their moderate size neighbors have a greater proportion of their farms planted to soybeans and corn.

Examining the average ending cash reserves for the large vs. the moderate size farms shows that nine of the moderate size farms can expect to see a greater increase in ending cash than the larger farms because of their participation in farm programs. For example, the moderate central Missouri (MOCG927) grain farm's average ending cash in 2021 is $174.80/hectare greater due to farm programs than the large farm's (MOCG1694). On the other hand the Texas Northern Plains grain farm (TXNP3226) has a $2,467,000 increase in ending cash due to farm program payments and the moderate farm (TXNP1391) has a $670,400 increase. On a per hectare basis the large farm increased ending cash by $283/hectare more than the moderate size farm.

Two of the primary causes for the differences by farm size are average yields experienced on each of the farm sizes and payment limits for the ARC and PLC. Differences in actual harvested yields, PLC payment yields, and insurance yields very likely account for much of the differences in farm results. While many farms in the U.S. are structured such that payment limits are not binding, for those that are not, the larger the farm the more likely payment limits will reduce the amount of safety net support.

## Crop Insurance

The average per hectare insurance indemnity payments are greater for moderate size farms in seven of the 16 regions. In five of the regions the per hectare payments are less than $1.20/ hectare difference between the moderate and large farms. The average per hectare indemnity payments are greater for the large farm in the Texas Southern Plains (TXSP) because the crop mix for the large farm is much different than the moderate size farm and a smaller portion of land is irrigated. Overall the crop insurance program is structurally neutral to biased towards the moderate size crop farms included in the study.

Nineteen of the 32 representative crop farms would experience an increase in nominal ending cash reserves in 2021 if they did not purchase crop insurance. These results suggest that crop insurance premiums are too high relative to the actual risk faced by the representative farms. On a per hectare basis the crop insurance benefits are about neutral with nine of the moderate farms receiving greater benefits than the large farms.

## Summary

The U.S. safety net programs in the 2014 Farm Bill are paid on a per base hectare basis if prices or revenues fall below specified levels. Crop insurance indemnity payments are paid based on verified damages to yields and/or calculated losses in revenue on actual hectares. The question remains are farm program payments and crop insurance structurally neutral?

The purpose of this paper was to test the hypothesis that farm programs and crop insurance are structurally biased to benefit large farms. A Monte Carlo farm simulation model was used to simulate crop farms (moderate and large) from 16 principal production regions in the United States. The farms used for the analysis are representative of feed grain, wheat, oilseed, cotton, and rice farms developed from individual farm panel (focus group) interviews with commercial size, fulltime farmers.

The 2016-2021 planning horizon was simulated using stochastic crop yields drawn from multivariate probability distributions estimated using actual farmer's historical yields. Stochastic crop prices in the FAPRI December 2016 Baseline were used as national prices, which were localized based on the panels' historical marketing basis.

Results of the analysis indicate that the per hectare farm program payments are not biased towards large farms. In fact the results show that moderate size farms receive greater

dollar per hectare government payments than large farms. Regarding crop insurance benefits, the analysis suggests that crop insurance is structurally neutral or slightly biased toward moderate size farms. In nine of the 16 regions the moderate farms received greater per hectare payments than the large farms while the payment per hectare is less than a $2.60 difference for four farm regions. These results suggest that we should reject the null hypothesis that farm programs and crop insurance are structurally biased in favor of large farms.

The simulation model calculates the ending cash reserves for the farms in 2021. Seven of the large farms have greater ending cash reserves due to farm programs than the moderate farms. The greater ending cash for these farms is not an indication that farm programs are structurally biased but it is due to the large farms having more hectares. To the extent that large farms can generate more cash reserves it affords them the financial ability to grow faster than smaller farms.

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