Government Payments and Structural Change in Agriculture

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Abstract. Economic theory suggests several possible mechanisms through which direct government farm payments might influence the pattern of structural change in agriculture. This study estimates what effect farm payments have had on farm structure using farm-level panel data from the 1987, 1992, and 1997 Agricultural Censuses. Results suggest that the size of per-acre payments received in the past are associated with a small and weakly positive change in farm size between consecutive censuses, but that payments are significantly correlated with an increased likelihood of farm survival between consecutive periods.

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1. Introduction

While the influence of government payments on agricultural structure has long been of concern to policy makers and agricultural economists, recent increases in payments to farmers have heightened interest in this issue. Some interest groups have raised concerns that farm payments are hastening the concentration of production in agriculture to the detriment of small farms. The Environmental Working Group, for example, argues that government payments have allowed large farms to “increase their competitive advantage over smaller producers, making it that much more difficult for small and medium sized farmers to make a profit from their farming operations” (Williams-Derry and Cook, p.6). Concern over the allocation of farm payments spurred a debate in Congress to tighten payment caps on large-scale producers. In response to this debate, the 2002 Farm Act created a Commission on the Application of Payment Limitations for Agriculture to study the effects of limitations on the receipt of direct payments, counter-cyclical payments, loan deficiency payments and marketing loan gains by producers and other entities.

Economic theory suggests several possible mechanisms through which direct government payments to farmers might influence changes in farm size and farm entry and exits (see Harrington for a review). As a reference point, we consider the neoclassical model of farm size developed by Kislev and Peterson in which farm payments do not affect scale. In their model, the amount of agricultural land is fixed and labor and capital are mobile between agricultural and non-agricultural sectors. Consequently, government payments that increase agricultural returns are capitalized into the price of land but do not affect the relative returns of labor or capital, and therefore do not affect farm size. Within the context of the Kislev and Peterson model, however, it is not possible to consider the implications of policies that disproportionately benefit farms of different sizes, because their model assumes there is just one representative farm.
In a model that includes farms of different sizes and in which size is defined in terms of acres operated, government payments may influence farm structure. If payments per acre are higher, on average, for larger farms than smaller farms, then these payments raise profits more for larger operations. Higher profits allow larger farms to expand and bid up the prices of fixed resources – especially land – which can cause smaller farms to shrink or exit.

Agricultural Census data reveal that large farms do not, in fact, receive more payments per acre than small farms. As shown in figure 1, average government payments per acre increase only until farms reach approximately 500-800 acres, after which they decline (for comparison, in 1997 the average farm size in our sample was 892 acres and the median farm size was 640 acres). Government payments per acre may be low for small farm sizes if transaction costs associated with farm program participation discourage small-scale farms from enrolling in programs that provide payments.¹

Although payments per acre decline after about 800 acres, it is farms with more than 800 acres that control an increasing share of US farmland. Table 1 reports summary statistics on the size and number of farms for each Census year between 1978 and 1997. The data used to construct the table are limited to farms in counties where most land is used for major commodity crops.² The table shows that the number of farms with more than 800 acres increased between 1978 and 1997, with their collective share of total farmland rising from 47.4% to 62.1%. In contrast, smaller farms declined in number and farmland share. The growth rates and exit rates of individual farms also reflect an expansion of large farms at the expense of smaller farms. As

¹ Alternatively, it could be that the relationship is simply a reflection of the types of farms that receive payments—payments mostly target field crop farms, which are larger, on average, than vegetable and tree crop farms. It is likely that payments per acre decline after about 800 acres because a large share of the land in these farms resides in low-value activities that do not qualify for government payments, such as hay, pasture, and range. Unfortunately, we cannot confirm this supposition with because our data do not differentiate between cropland, rangeland, and pastureland.

² There were 765 counties where land in barley, corn (grain), cotton, hay, oats, rice, sorghum (grain), soybean, and wheat represented at least 90% of the total land harvested.
shown in figure 2, the Census data show that farms with more than 800 acres grew fastest, despite having lower per-acre payments than farms with somewhat smaller sizes. In addition, farms with 1000-2000 acres had lower average exit rates than mid-sized farms in the 500-800 acre range, despite having lower per-acre payment rates (see figure 2).

Larger farms grew faster than smaller farms, had lower exit rates, and gained in number and share of farmland, despite having lower average payments per acre than mid-sized farms. On the other hand, total payments increase, on average, with farm size (see figure 3). This pattern suggest that if government payments play a role in structural change in agriculture, then it could be total payments received by a farm – not just payments per acre – that matter for farm growth and survival.

Imperfect capital markets could provide a mechanism through which total payments affect farm size. Liquidity constraints may cause a farm’s cost of capital to depend on its net worth: farms with greater net worth face lower borrowing costs because they have more resources with which to secure a loan (e.g., Hubbard). If this is the case, an increase in income from government payments raises the net worth of a farm, which makes it less costly for the farm to obtain financing. Payments allow liquidity-constrained farms to borrow more and increase farm size. Hence, if large farms are liquidity constrained and small farms are not then an increase in payments would cause large farms to expand and increase in number, which bids up land prices and causes small farms to shrink and decline in number (Roberts and Key). If both large and small farms are liquidity constrained, then the effect of an increase in government payments on farm size and numbers is ambiguous.

Total payments could also affect farm growth and survival if payments alter operator labor-leisure decisions through a wealth effect. Higher payments increase farm income, which, if leisure is a normal good, induces farmers to substitute leisure for labor. With perfect markets
this substitution effect would not affect on-farm labor levels or farm size—hired labor would provide a perfect substitute for labor lost to increased leisure. However, if markets are missing or imperfect, then farm household consumption and production decisions become non-separable, and the optimal allocation of labor may differ from that of a profit maximizing firm (Lopez; Strauss). In this case, higher government payments could reduce on-farm labor, production, and farm size. In general equilibrium, however, the effect of payments on farm size is ambiguous. For example, an increase in payments could cause large farms to reduce their demand for land, resulting in lower land prices. Lower land prices could induce small farms to expand, despite the wealth effect from the government payments.

In sum, the effect of government farm payments on farm size and farm numbers is theoretically ambiguous. In the absence of transaction costs or market imperfections, there would seem to be no theoretical link between payments and structure. But in the real world, transaction costs and market imperfections might interact with government payments in complex ways. Given the theoretical ambiguity of the effect of payments on structure, we choose to address the empirical question as to whether the level of farm payments have had any affect on the size or survival of individual farms using a non-structural approach.

A limited number of econometric studies have attempted to explain changes in the size and survival of farms based on characteristics of the farm operator or farm, but have not considered the role of government payments (see Hallam for a review). Important recent examples of these studies include Sumner and Leiby; Zepeda; Weiss; and Kimhi and Bollman. Some research that has estimated the effect of farm payments on farm structure has relied on economic model simulations (e.g., Leathers; and Atwood, Watts, and Baquet). There have also been a few studies that have examined the relationship over time between government payments and aggregate measures of farm structure, including the national agricultural bankruptcy rate
(Shepard and Collins), the total number of farms (Tweeten), and average farm size (Huffman and Evenson). Perhaps due to insufficient longitudinal data, there no studies that we are aware of that have examined the effect of government payments on the structure or survival of individual farms.

In this study, we estimate what effect, if any, farm payments have had on the size and survival of individual farms between 1987 and 1997. We use farm-level panel data from the 1987, 1992, and 1997 Agricultural Censuses that include information on farm size, government payments, and characteristics of the farm operation and operator. We test whether the size of payments received in the past affects 1) the growth of farms that were in existence in consecutive censuses and 2) the probability that a farm exits between consecutive periods.

The large data set permits us to examine the relationship between payments and structure among only those farmers producing the same commodity and located within the same county. By controlling for characteristics unique to the county in which a farm is located, and by running separate regressions for farms producing different commodities, identification is based only on differences between individual farmers within counties and crops. This approach should control for most unobserved geographic heterogeneity and for unobserved heterogeneity associated with production practices particular to specific climates and regions.

The next section we discuss our econometric approach. Section 3 describes construction of the sample and variables used in the regressions. Section 4 presents the empirical results and section 5 concludes.

2. Methods

Our main objective is to obtain evidence on the links between government payments and farm size growth and exit. Most variation in government payments across farms results from
variation in farm sizes and the types of crops grown. However, the types of crops a farmer grows are important factors in determining farm size. For example, grain farms tend to be larger than vegetable and fruit farms. Due to the structure of farm programs, grain farms receive far more government payments than vegetable and fruit farms. Hence, there is a positive relationship between payments and farm size that is not causal. Our goal is to isolate a source of government payment variation that is uncorrelated with fundamental features that determine farm size, such as crop mix, observed characteristics of the operator and operation, and unobserved factors unique to a geographical region.

The basis of this empirical approach is to exploit an exogenous source of variation in government payments – differences in payments that result from differences in ‘base acreage’ in otherwise identical farms. Farmers that operate the same amount of land, located in the same county, producing the same crop may receive different levels of government payments if they have different amounts of land enrolled as ‘base acres’ – land enrolled in a particular commodity program based on past plantings. Variation in base acres has arisen from historical participation in government programs. Prior to 1996, compulsory planting restrictions elicited less than full participation in government programs – between 60 and 85 percent of qualified acres for most crops, and markedly less for oats. Since the 1996 Federal Agricultural Improvement and Reform Act, payments have been mostly decoupled from planting decisions and nearly all qualified acres have participated in farm programs. However, the bulk of payments (and nearly all payments in 1997) are still tied to historical base acreages. Thus, due to historical variation in participation, different farms have different base acres and receive different amounts of government payments.

Our approach is to limit the variation in government payments to within-county, within-crop variation in payments per acre. The remaining variation in payments between farms should

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3 This information can be obtained from historical commodity specific yearbooks that are available on the ERS website (www.ers.usda.gov).
stem primarily from variation in base acreages, which should be uncorrelated with current economic fundamentals.

Our regressions examine a reduced-form relationship between within-county, within-crop variation in government payments per acre and subsequent farm size growth. We estimate separate regressions corresponding to the six SIC (Standard Industrial Classification) codes that identify the primary commodity produced by the farm (wheat, rice, corn, soybean, cash grain, or cotton). Separate regressions allow for the estimation of different parameters across the commodity types, and reduce the heterogeneity within each sample. The estimated relationship is:

$$\log S_t = \alpha + \beta_3 \log S_{it-1} + \beta_G S_{iG_{it-1}} + \beta_X X_{it-1} + \beta_c C_i + \beta_t Y_t + \varepsilon_t$$

where $\log S_t$ is the log of the scale measure of farm $i$ (acres of farmland) in time $t$, $S_{iG_{it-1}}$ is a lagged farm scale categorical variable which is interacted with the government payments per acre $G_{it-1}$ to allow the effect of payments on structure to vary with scale. We use the land operated by the farm, rather than the value of sales as measure of farm size because the value of sales depends on prices and yields, both of which may be correlated with government payments. The vector $X_{it-1}$ includes lagged characteristics of the operator and factors influencing the liquidity and profitability of the farm. We also control for fixed effects associated with the county of the operation $C_i$ and the year $Y_t$.

A similar set of regressors are used in the analysis of farm exits, but the statistical approach differs. For the exit analysis, we assume that for each farm operator $i$ the present value of the net utility from exiting farming in time $t$ is given by an unobservable latent variable $E_t^*$.

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4 Cash grains include all grains except wheat, rice, corn, or soybean.
We do not observe the net utility from exiting \( E_t^* \), rather we observe the dichotomous variable \( E_t \), where \( E_t = 1 \) if \( E_t^* > 0 \) (the farmer exits in period \( t \)), and \( E_t = 0 \), otherwise. Assuming a probability distribution for the error term, the likelihood function for the model defined by (1) can be constructed. For this analysis we assume a logistic error distribution and estimate the parameters that maximize the likelihood function.

By limiting the variation in government payments to within-county, within-crop variation in payments per acre, we hope to have purged the variability that is most strongly associated with fundamental features of the farm operation that may be spuriously correlated with farm size. The remaining variation stems from within-county differences in the ‘base acreage’ and yield histories, to which most payments are tied.\(^5\) Furthermore, our panel data set allows us to condition current farm size on past farm size, which removes much of the individual heterogeneity of farms that may be spuriously correlated with payment levels.

3. Data

The data used in this study are derived from the Census of Agriculture Longitudinal file. This file is a collection of responses to a subset of questions from the Census of Agriculture for the years 1978, 1982, 1987, 1992, and 1997. Each data record represents the responses from one farm operation in each of the five censuses, allowing researchers to track changes in particular operations at four or five year intervals. There are approximately 4.5 million records in the five

\(^5\) Lagged government payments used in this study are only for the years 1987 and 1992. Rules governing the accumulation base acres have changed over the years. In recent years, Production Flexibility Payments and Market Loss Assistance Payments were determined according to a farm’s 1995 base acres. In the 2002 Farm Act, farmers were allowed to substitute their old base with a new base calculated according to average plantings since 1996.
Censuses. The Census data, which include almost all US farms, are maintained by the National Agricultural Statistics Service and stored in their Kansas City office.\textsuperscript{6}

For this study we only use information from the years in which government payments received by the farm household were recorded: 1987, 1992, and 1997. As mentioned above, we limit the sample to those farms with SIC codes identifying the primary commodity produced as wheat, rice, corn, soybean, cash grain, or cotton -- the SIC classes that receive the largest shares of government farm payments. We limit the sample further by keeping only those farms that responded to the long Census form (about 1/3 of farms received the long form, with large farms sampled with greater frequency than smaller farms). The long form contains information about input expenditures, which were used to compute farm profits per acre, and the value of farmland and buildings, which may serve as an indicator of farm wealth and liquidity.

To measure the effect of payments on continuing farms we create a subset of farms that report operating at least 10 acres of land in consecutive Censuses. To eliminate differences that may occur due to a change in the farm operator, we keep only those farms for which the age of the operator differs by five years – the length of time between consecutive Censuses.\textsuperscript{7} The continuing farm sample consists of 43,085 farms continuing between 1987 and 1992, and 41,110 farms continuing between 1992 and 1997.

Table 2 reports the mean values of the key variables for the continuing sample. Government payments per acre in the sample are quite large in comparison to the net returns per acre. Average lagged payments (1987 and 1992) were $30.18/acre for the continuing farms, which equal about 60\% of the average net returns of $49.28/acre.

\textsuperscript{6} More information about the Agricultural Census can be found at: http://www.nass.usda.gov/census/.
\textsuperscript{7} The Census longitudinal file tracks Census files numbers (CFN’s) which are associated with the farm business rather than the farm operator. A farm is defined as out of business if there is no response to the Census questionnaire or the questionnaire is returned stating that the farm is no longer operating. If a farm changes operators through a business transaction or inheritance the CFN may not change.
We create a second sample of farms to examine the effect of payments on farm survival. This sample includes all farms that were operating in 1987 and either exited or continued farming in 1992, and farms that were operating in 1992 and either exited or continued farming in 1997. In other words, the sample does not include farms that entered production during the two consecutive five-year periods between Censuses (1987-92 and 1992-97). Restricting the Census information in this way limits the total number of farms to 79,944 in 1987-92 and 74,445 in 1992-97.

Table 2 reports summary statistics for the key variables for the exit analysis sample. The exit rate for the five-year periods between Censuses was 41.3%, ranging from 34.7% for “cash grain” farms to 49.8% for cotton farms. These exit rates are somewhat higher than have been reported elsewhere because the surviving farms in this sample are restricted to those where the age of the operator in consecutive Censuses differs by five years – this reduces the number of surviving farms, but does not reduce the number of exiting farms. In addition, because some Census survey non-responses are classified as exits even if the farm is still operating (see previous footnote) the Census overestimates the actual rate of exit rate to some degree. However, the five-year exit rates are equivalent to annual exit rates between 8-13%, which are not out of line with exit rates for small non-farm businesses.

Several patterns emerge from comparison of the two samples. The lagged average farm size in the exiting sample is smaller than the continuing sample (864 acres as compared to 945 acres). Because the sample is inclusive of continuing farms, this difference understates the average difference of continuing and exiting farm sizes. As compared to continuing farms, exiting farms received lower government payments per acre, had older operators, were less likely to be comprised of both rented land and owner-operated land, were more likely to be a
partnership or corporation, and less likely to be a sole proprietorship. Exiting farms also had somewhat lower returns per acre but approximately the same level of assets per acre.

4. Estimation Results

Continuing Farms

Table 3 presents parameter estimates for six separate farm-size growth regressions, one for each of the six primary commodities. Table 4 presents the associated F-test statistics for the significance of each variable. Each regression includes the lagged value of land and buildings and lagged profits per acre, and an indicator of the type of farm organization (family or individual/partnership/incorporated/other) and land tenure indicators (own all land/rent in all land/rent in some land). Farm operator characteristics include the age of the operator in the previous period (indicated by five age category dummies) and the operator’s primary occupation (farm/non-farm). A lagged farm size categorical variable is interacted with the lagged government payments to allow the effect of government payments to vary with the size of the farm. Coefficients associated with the county fixed effects are not reported.

The significance tests for the estimated coefficients display several patterns that are consistent across five of the six regressions. Rice, which had few significant variables, is the exception - probably because of the small sample size. Lagged farm size is very significant and explains most of the variation in current farm size. Except for rice, the bottom three age category variables are highly significant and have the expected sign. Farms with younger

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8 To ensure enough within-county variation for identification, we limit the sample to farms in counties in which at least 15 farms produced a given commodity.
9 Inclusion of lagged farm size as an explanatory variable may introduce serial correlation in the error. Because there are only two or three observations for each farm, this introduces a mild degree of dependence (most of the variation in the error is cross-sectional). We did estimate a model with first-order autocorrelation that failed to reject the hypothesis that the autocorrelation parameter equaled zero. Also, in that model the coefficient estimates and standard errors were nearly identical to those we report in table 3.
operators increase in size more rapidly. For example, corn farms with operators younger than 39 years increased in size by about 39% more than farmers over 67 years, while farmers 39-48 years old increased their average farm size about 29% more than farmers over 67 years. A similar pattern emerges for wheat and cash grain producers.

For all commodities except rice, operators who farmed as a primary occupation increased the size of their operation 8-20% more than did operators for whom farming was not their primary occupation. Tenure had a marginally significant influence on farm size, with operators who owned all their land or rented all their land expanding their operation more than farmers that owned only a share of their land. The type of organization was a significant factor in explaining farm size change: corn, soybean, and cash grain farms that were incorporated under state law grew 6-13% more on average than operations organized as family or individual farms. The value of land and buildings per acre and profits per acre were both generally positively associated with larger farm size growth, though the relationship was only statistically significant for some crops.

Of particular interest for this study, lagged government payments appear to have only a weakly significant positive effect on the change in farm size over the five-year periods between Censuses. We cannot reject the null hypothesis that the parameters equal zero at the 1% confidence level, for 26 of the 30 crop-size categories.\textsuperscript{10} If government payments influence farm-size growth, the effect appears to be small in most cases. As shown in table 4, for three of the six crops, the F-statistic associated with the interaction of farm size category and government payments shows that we fail to reject the joint null hypothesis that there is zero effect from government payments for all farm size categories. We cannot reject the null hypothesis for the corn, soybean, or cash grain regressions.

\textsuperscript{10} The significant parameters reveal that a $10/acre increase in payments results in only a 0.04 – 0.009 acre increase in farm size.
Farm Exits

Table 5 presents the results of the logistic regression with a dependent variable that indicates whether or not a farm operating in the previous Census exited farming before the current Census. The same regressors used in the farm growth analysis are used in the logit analysis. For each logistic regression, the chi-square statistic associated with the likelihood ratio test is highly significant indicating the overall model is statistically significant. To make interpretation of the estimated coefficients more intuitive, table 5 presents the average marginal effects for the sample. The marginal effect of the independent variable on the probability is equal to

\[
dp/dB = f(BX)B
\]

where \( f(.) \) is the logistic density function, \( X \) are the regressors and \( B \) the vector of estimated parameters. Table 6 presents the chi-square statistics associated with the tests of individual effects of the variables in the logistic regression.

The significance tests for the estimated logistic model display several consistent results across the regressions. Farm size in the previous period is significantly negatively correlated with the probability of exiting – a larger farm has a smaller likelihood of exiting farming, holding all else constant (this was evident in figure 2). The age category fixed effects are also highly significant and have the expected sign. Being younger (less than 57 years old) reduces the probability of exiting by 20-40 percentage points as compared to being over 67 year old.

Having farming as a primary occupation is weakly associated with a reduced likelihood of a farm exiting. The tenure status of the farm was very significant – having all the land owned by the operator increased the likelihood of exiting by 20-31 percentage points compared to having some of the land rented. Renting in all the land increased the probability of exiting by 9-
13 percentage points. Interestingly, family farms appear to be a robust form of organization. Having a farm organized as partnership very significantly increases the chance that a farm exits between 21-33 percentage points compared to a family farm. Being incorporated or organized in another way also increases the likelihood that a farms exits relative to being organized as a family farm.

Having a greater value of land and buildings per acre significantly reduced the likelihood of exiting between periods for corn and soybean farms, but there was no significant effect for other crop farms. Higher profits per acre reduced the likelihood of exiting for wheat, cash grain and cotton farms.

Of particular interest, an increase in government farm payments per acre significantly reduces subsequent farm exit rates, for most size categories and crops. Excluding rice farms, an increase in payments was associated with a statistically significant reduction in the likelihood of exiting for 15 of the 25 crop-size categories, and all of the crop-size categories between 250-1000 acres. In general the effect was small and varied somewhat by crop. For example, an extra $10/acre in payments reduces the likelihood that a wheat farmers with more than 250 acres will exit by 4-5 percentage points (from an average exit rate of 44.8%). On the other hand, a $10/acre increase in payments for a corn farmer with between 250-2000 acres reduces the likelihood of exiting by only 0.8-1.5 percentage points (from an average exit rate of 41.7%). The statistical significance of the results are confirmed by the chi-square statistics presented in table 6, which show that, for all crops except rice, we can reject the null hypothesis that the parameters on the government payments parameters are zero.
5. Conclusion

Results indicate that government payments have a weakly significant and small effect on the rate at which farms grow. However, the results do indicate that $10/acre increase in government payments, all else the same, reduces the likelihood of exit over five years by 1 to 4 percentage points from the initial exit rates of 35-50%. The magnitude of the effect of government payments on the exit rate does not seem to be associated with the size of the farm.

It is notable that government payments influence farm exit rates but have little effect on farm size growth. Perhaps higher government payments raise net returns, which reduces the likelihood of financial insolvency and allows farms to remain in business longer. Higher payments may also make agriculture more profitable relative to alternative occupations, which reduces the incentive to quit farming. The fact that higher payments do not result in significantly greater farm size implies that farmers do not use a small increase in payments to expand production. This pattern suggests that liquidity constraints do not bind at the margin, so farms not exiting are able to achieve and maintain their desired scale. This result also suggests that government payments do not influence labor allocation decisions through a wealth effect.

Our findings imply a modest influence of government payments on structure but do not confirm the concerns expressed by some groups that government payments cause an increase in concentration by facilitating further growth of the largest farms. Holding farm size and other characteristics of the operator and operation constant, we find that government payments do not significantly influence farm size. The analysis used here, however, takes the current distribution of farm payments as given, and compares how a marginal change in payments affects farm size. The empirical methodology cannot be used to address how farm size would change if there were a discrete change in the distribution of payments to a situation where there were no payments or a dramatically different distribution of payments.
Because the impact of payments on exits is approximately the same across farm size categories, the results imply that a redistribution of program payments on the margin from the largest farms to smaller farms would reduce the overall number of farm exits among the farms that receive payments. The number of exits would decline because a transfer of one dollar per acre from a large farm can result in an increase of one dollar per acre on several smaller farms. A cap on total payments would limit payments received by some farms in the largest size group. Our results suggest that such a limit would increase the exit rate of large farms but not the exit rate of small farms. Future work could try to establish whether new entrants or continuing farms are more likely to gain control of the lands left by exiting farms and determine the size classes of the land-acquiring farms. This information would provide deeper insight into the overall affect of payments on structure.
References


Roberts, Michael and Nigel Key “Risk and structural change in agriculture: How idiosyncratic income shocks impact farm size” Presented at the Annual Meetings of the American Agricultural Economics Association, Long Beach, California, August, 2002


Table 1. Farm Structure for Agricultural Census Years 1978-1997 in Major-Commodity Producing Counties.

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<td>15.89</td>
<td>13.84</td>
<td>12.02</td>
<td>11.03</td>
</tr>
<tr>
<td>400-800</td>
<td>21.35</td>
<td>21.06</td>
<td>20.23</td>
<td>18.61</td>
<td>16.97</td>
</tr>
<tr>
<td>&gt;800</td>
<td>47.38</td>
<td>50.90</td>
<td>54.96</td>
<td>59.67</td>
<td>62.13</td>
</tr>
</tbody>
</table>

Figure 1. Government Payments per Acre by Farm Type and Size for Study Sample

Figure 2. Growth of Continuing Farms and Percent of Farms Exiting by Farm Size for Study Sample

Source: Agricultural Census, 1987, 1992 and 1997. See text for details for how sample was constructed. Standard error is indicated by dashed line.
Figure 3. Total Government Payments and Farm Size for Study Sample

Source: Agricultural Census, 1987, 1992 and 1997. See text for details for how sample was constructed. Standard error is indicated by dashed line.
Table 2. Variable Definitions and Summary Statistics for Continuing and Exiting Samples

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Definition</th>
<th>Continuing</th>
<th>Exiting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Farm Size</td>
<td>Land in farm (acres owned + rented in – rented out)*</td>
<td>982.9</td>
<td>1061.7</td>
</tr>
<tr>
<td>L_Farm Size</td>
<td>Lagged land in farm (acres)</td>
<td>944.6</td>
<td>961.7</td>
</tr>
<tr>
<td>L_Size 10-250</td>
<td>10 ≤ Lagged land in farm (acres) &lt; 250</td>
<td>0.203</td>
<td>0.402</td>
</tr>
<tr>
<td>L_Size 250-600</td>
<td>250 ≤ Lagged land in farm (acres) &lt; 600</td>
<td>0.219</td>
<td>0.414</td>
</tr>
<tr>
<td>L_Size 600-1000</td>
<td>600 ≤ Lagged land in farm (acres) &lt; 1000</td>
<td>0.233</td>
<td>0.423</td>
</tr>
<tr>
<td>L_Size 1000-2000</td>
<td>1000 ≤ Lagged land in farm (acres) &lt; 2000</td>
<td>0.246</td>
<td>0.431</td>
</tr>
<tr>
<td>L_Size 2000-10000</td>
<td>2000 ≤ Lagged land in farm (acres) &lt; 10000</td>
<td>0.099</td>
<td>0.299</td>
</tr>
<tr>
<td>L_Govt. Payments</td>
<td>Lagged government payments (1997 $)</td>
<td>26532</td>
<td>42768</td>
</tr>
<tr>
<td>L_Govt. Pay/Acre</td>
<td>Lagged government payments per acre in farm (1997 $/acre)</td>
<td>30.18</td>
<td>34.25</td>
</tr>
<tr>
<td>Year 1992</td>
<td>Current year is 1992 (not 1997)</td>
<td>0.512</td>
<td>0.500</td>
</tr>
<tr>
<td>L_Age &lt;39</td>
<td>Lagged age of operator (years) &lt; 39</td>
<td>0.228</td>
<td>0.420</td>
</tr>
<tr>
<td>L_Age 39-48</td>
<td>39 ≤ Lagged age of operator (years) &lt; 48</td>
<td>0.239</td>
<td>0.426</td>
</tr>
<tr>
<td>L_Age 48-57</td>
<td>48 ≤ Lagged age of operator (years) &lt; 57</td>
<td>0.242</td>
<td>0.428</td>
</tr>
<tr>
<td>L_Age 57-67</td>
<td>57 ≤ Lagged age of operator (years) &lt; 67</td>
<td>0.204</td>
<td>0.403</td>
</tr>
<tr>
<td>L_Age &gt;67</td>
<td>Lagged age of operator (years) ≥ 67</td>
<td>0.087</td>
<td>0.282</td>
</tr>
<tr>
<td>L_Occup. - Farm</td>
<td>Lagged principal occupation of operator was farming</td>
<td>0.838</td>
<td>0.368</td>
</tr>
<tr>
<td>L_Tenure - Owner</td>
<td>All land in farm owned</td>
<td>0.196</td>
<td>0.397</td>
</tr>
<tr>
<td>L_Tenure - Tenant</td>
<td>All land in farm rented in</td>
<td>0.165</td>
<td>0.371</td>
</tr>
<tr>
<td>L_Tenure – Some Rent</td>
<td>Land in farm owned and rented in</td>
<td>0.639</td>
<td>0.480</td>
</tr>
<tr>
<td>L_Org. – Partner</td>
<td>Lagged organization type was partnership</td>
<td>0.096</td>
<td>0.294</td>
</tr>
<tr>
<td>L_Org. – Incorp.</td>
<td>Lagged organization type - incorporated under state law</td>
<td>0.066</td>
<td>0.249</td>
</tr>
<tr>
<td>L_Org. – Other</td>
<td>Lagged organization type - other (estate, trust, reservation, etc.)</td>
<td>0.005</td>
<td>0.073</td>
</tr>
<tr>
<td>L_Org. – Family</td>
<td>Lagged organization type – family or individual</td>
<td>0.832</td>
<td>0.373</td>
</tr>
<tr>
<td>L_Assets/Acre</td>
<td>Lagged value of land and buildings per acre (1997 $/acre)</td>
<td>1385.6</td>
<td>1128.6</td>
</tr>
<tr>
<td>L_Net Returns/Acre</td>
<td>Lagged net returns per acre (1997 $/acre)</td>
<td>49.28</td>
<td>83.20</td>
</tr>
<tr>
<td>Exit</td>
<td>Farm operation out of business in current period</td>
<td>0.413</td>
<td>0.492</td>
</tr>
</tbody>
</table>

Source: Agricultural Census, 1987, 1992 and 1997. “Continuing” sample includes farms in business in consecutive Censuses; “Exiting” sample includes farms in business in previous Census, that may or may not be in business in current Census. See text for details for how samples were constructed.

*The mean of “Land in farm” for “Exiting” sample is only for farms that did not exit.
Table 3. Parameter Estimates for Linear Regression Model of Continuing Farm Growth

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Corn</th>
<th>Soybean</th>
<th>Cash grains</th>
<th>Cotton</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.8930</td>
<td>3.45</td>
<td>0.1326</td>
<td>1.00</td>
<td>0.7884</td>
<td>3.82</td>
</tr>
<tr>
<td>log(L_Farm Size)</td>
<td>0.8271</td>
<td>31.04</td>
<td>0.8690</td>
<td>81.00</td>
<td>0.8428</td>
<td>60.88</td>
</tr>
<tr>
<td>L_Size 10-250</td>
<td>0.0295</td>
<td>0.3</td>
<td>-0.00205</td>
<td>-0.05</td>
<td>-0.0605</td>
<td>-0.93</td>
</tr>
<tr>
<td>L_Size 250-600</td>
<td>-0.0854</td>
<td>-1.21</td>
<td>-0.327</td>
<td>-1.18</td>
<td>-0.3333</td>
<td>-2.62</td>
</tr>
<tr>
<td>L_Size 600-1000</td>
<td>-0.0483</td>
<td>-0.83</td>
<td>-0.0162</td>
<td>-0.69</td>
<td>0.0050</td>
<td>0.10</td>
</tr>
<tr>
<td>L_Size 1000-2000</td>
<td>-0.0556</td>
<td>-1.37</td>
<td>0.0285</td>
<td>1.36</td>
<td>0.0421</td>
<td>0.84</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 10-250</td>
<td>-0.00072</td>
<td>-0.58</td>
<td>0.00091</td>
<td>4.55</td>
<td>0.00138</td>
<td>4.40</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 250-600</td>
<td>0.00104</td>
<td>0.77</td>
<td>0.000392</td>
<td>2.04</td>
<td>0.000687</td>
<td>1.75</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 600-1000</td>
<td>0.00091</td>
<td>0.66</td>
<td>0.000527</td>
<td>2.71</td>
<td>0.00104</td>
<td>2.39</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 1000-2000</td>
<td>0.00248</td>
<td>2.49</td>
<td>0.000146</td>
<td>0.59</td>
<td>0.00117</td>
<td>2.21</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 2000-10000</td>
<td>-0.00083</td>
<td>-0.69</td>
<td>0.000234</td>
<td>1.20</td>
<td>0.00482</td>
<td>2.84</td>
</tr>
<tr>
<td>Year 1992</td>
<td>0.00748</td>
<td>0.40</td>
<td>-0.01868</td>
<td>-1.91</td>
<td>-0.04005</td>
<td>-2.56</td>
</tr>
<tr>
<td>L_Age &lt;39</td>
<td>0.3144</td>
<td>10.67</td>
<td>0.3869</td>
<td>24.00</td>
<td>0.3561</td>
<td>15.15</td>
</tr>
<tr>
<td>L_Age 39-48</td>
<td>0.2609</td>
<td>9.19</td>
<td>0.2915</td>
<td>18.26</td>
<td>0.00104</td>
<td>2.39</td>
</tr>
<tr>
<td>L_Age 48-57</td>
<td>0.2679</td>
<td>9.78</td>
<td>0.2172</td>
<td>13.76</td>
<td>0.1870</td>
<td>8.19</td>
</tr>
<tr>
<td>L_Age 57-67</td>
<td>0.1246</td>
<td>4.76</td>
<td>0.0273</td>
<td>1.72</td>
<td>0.0105</td>
<td>0.47</td>
</tr>
<tr>
<td>L_Occup. - Farm</td>
<td>0.0816</td>
<td>3.03</td>
<td>0.1440</td>
<td>11.60</td>
<td>0.1328</td>
<td>8.03</td>
</tr>
<tr>
<td>L_Tenure - Owner</td>
<td>0.0611</td>
<td>2.63</td>
<td>0.0367</td>
<td>3.20</td>
<td>0.0438</td>
<td>2.65</td>
</tr>
<tr>
<td>L_Tenure - Tenant</td>
<td>0.0702</td>
<td>2.85</td>
<td>0.0320</td>
<td>3.07</td>
<td>0.0389</td>
<td>2.36</td>
</tr>
<tr>
<td>L_Org. – Partner</td>
<td>-0.0271</td>
<td>-0.87</td>
<td>0.0188</td>
<td>1.38</td>
<td>-0.0188</td>
<td>-0.91</td>
</tr>
<tr>
<td>L_Org. – Incorp.</td>
<td>0.0331</td>
<td>1.18</td>
<td>0.0633</td>
<td>4.30</td>
<td>0.1268</td>
<td>4.50</td>
</tr>
<tr>
<td>L_Org. – Other</td>
<td>0.1477</td>
<td>1.33</td>
<td>-0.0300</td>
<td>-0.61</td>
<td>0.00468</td>
<td>0.05</td>
</tr>
<tr>
<td>log(L_Assets/Acre)</td>
<td>0.0124</td>
<td>0.70</td>
<td>0.0298</td>
<td>3.42</td>
<td>0.01159</td>
<td>0.88</td>
</tr>
<tr>
<td>L_Net Returns/Acre</td>
<td>0.000424</td>
<td>1.57</td>
<td>0.000929</td>
<td>2.07</td>
<td>0.000273</td>
<td>3.58</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.7275</td>
<td>3.45</td>
<td>0.1326</td>
<td>1.00</td>
<td>0.7884</td>
<td>3.82</td>
</tr>
<tr>
<td>F-value (Pr &gt; F)</td>
<td>132.29 &lt;.001</td>
<td>187.09 &lt;.001</td>
<td>141.18 &lt;.001</td>
<td>120.63 &lt;.001</td>
<td>56.64 &lt;.001</td>
<td>34.31 &lt;.001</td>
</tr>
<tr>
<td>Observations</td>
<td>5460</td>
<td>21511</td>
<td>9918</td>
<td>20553</td>
<td>2860</td>
<td>1324</td>
</tr>
</tbody>
</table>

Notes: Dependent Variable: log(Farm Size). Coefficients in **bold** are significant at the 1% confidence level. **t-val** is the statistic corresponding to the test of the null hypothesis that the estimated coefficient equals zero.
Table 4. – Analysis of Effects for Linear Regression Model of Continuing Farm Growth

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Corn</th>
<th>Soybean</th>
<th>Cash grains</th>
<th>Cotton</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F-Value</td>
<td>Pr&gt;F</td>
<td>F-Value</td>
<td>Pr&gt;F</td>
<td>F-Value</td>
<td>Pr&gt;F</td>
</tr>
<tr>
<td>County fixed effects</td>
<td>1.87</td>
<td>&lt;.0001</td>
<td>1.25</td>
<td>0.0011</td>
<td>1.25</td>
<td>0.0046</td>
</tr>
<tr>
<td>log(L_Farm Size)</td>
<td>0.16</td>
<td>0.6875</td>
<td>3.66</td>
<td>0.0557</td>
<td>6.54</td>
<td>0.0106</td>
</tr>
<tr>
<td>L_Size fixed effects</td>
<td>963.74</td>
<td>&lt;.0001</td>
<td>6560.21</td>
<td>&lt;.0001</td>
<td>3706.06</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Size * (L_Govt. Pay/Acre)</td>
<td>1.97</td>
<td>0.0966</td>
<td>4.09</td>
<td>0.0026</td>
<td>1.85</td>
<td>0.117</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>1.66</td>
<td>0.1412</td>
<td>5.61</td>
<td>&lt;.0001</td>
<td>6.92</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Age</td>
<td>39.57</td>
<td>&lt;.0001</td>
<td>316.41</td>
<td>&lt;.0001</td>
<td>120.17</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Occup</td>
<td>9.18</td>
<td>0.0025</td>
<td>134.5</td>
<td>&lt;.0001</td>
<td>64.5</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Tenure</td>
<td>6.09</td>
<td>0.0023</td>
<td>7.91</td>
<td>0.0004</td>
<td>4.96</td>
<td>0.007</td>
</tr>
<tr>
<td>L_Org.</td>
<td>1.38</td>
<td>0.2479</td>
<td>6.64</td>
<td>0.0002</td>
<td>7.38</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>log(L_Assets/Acre)</td>
<td>0.48</td>
<td>0.487</td>
<td>11.72</td>
<td>0.0006</td>
<td>0.78</td>
<td>0.3772</td>
</tr>
<tr>
<td>L_Net Returns/Acre</td>
<td>2.48</td>
<td>0.1155</td>
<td>4.28</td>
<td>0.0386</td>
<td>12.83</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

Note: The F-Value is the statistic associated with the test of the null hypotheses that all embodied effects jointly equal zero.
Table 5. Parameter Marginal Effects for Logistic Model of Farm Exits

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Corn</th>
<th>Soybean</th>
<th>Cash grains</th>
<th>Cotton</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-val.</td>
<td>Coeff.</td>
<td>t-val.</td>
<td>Coeff.</td>
<td>t-val.</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.6725</td>
<td>6.06</td>
<td>0.8246</td>
<td>22.19</td>
<td>0.8013</td>
<td>9.09</td>
</tr>
<tr>
<td>log(L_Farm Size)</td>
<td>-0.1357</td>
<td>24.76</td>
<td>-0.0949</td>
<td>80.38</td>
<td>-0.0902</td>
<td>54.98</td>
</tr>
<tr>
<td>L_Size 10-250</td>
<td>-0.1309</td>
<td>1.78</td>
<td>0.0530</td>
<td>1.42</td>
<td>0.0392</td>
<td>0.44</td>
</tr>
<tr>
<td>L_Size 250-600</td>
<td>-0.0559</td>
<td>0.59</td>
<td>0.0909</td>
<td>6.54</td>
<td>0.0416</td>
<td>0.68</td>
</tr>
<tr>
<td>L_Size 600-1000</td>
<td>0.0188</td>
<td>0.10</td>
<td>0.0858</td>
<td>3.24</td>
<td>0.0346</td>
<td>0.50</td>
</tr>
<tr>
<td>L_Size 1000-2000</td>
<td>-0.00057</td>
<td>0.00</td>
<td>0.00786</td>
<td>0.06</td>
<td>-0.0633</td>
<td>1.78</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 10-250</td>
<td>-0.00188</td>
<td>3.58</td>
<td>-0.00035</td>
<td>3.33</td>
<td>-0.00056</td>
<td>3.48</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 250-600</td>
<td>-0.00423</td>
<td>8.50</td>
<td>-0.00087</td>
<td>15.29</td>
<td>-0.00108</td>
<td>6.82</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 600-1000</td>
<td>-0.00399</td>
<td>7.63</td>
<td>-0.00080</td>
<td>10.32</td>
<td>-0.00185</td>
<td>12.34</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 1000-2000</td>
<td>-0.00431</td>
<td>14.99</td>
<td>-0.00150</td>
<td>18.76</td>
<td>-0.00241</td>
<td>12.34</td>
</tr>
<tr>
<td>(L_Govt. Pay/Acre)*L_Size 2000-10000</td>
<td>-0.00515</td>
<td>13.64</td>
<td>-0.00071</td>
<td>0.98</td>
<td>-0.00098</td>
<td>0.32</td>
</tr>
<tr>
<td>Year 1992</td>
<td>0.0454</td>
<td>5.20</td>
<td>0.0441</td>
<td>16.55</td>
<td>0.02207</td>
<td>2.58</td>
</tr>
<tr>
<td>L_Age &lt;39</td>
<td>-0.2042</td>
<td>44.50</td>
<td>-0.2688</td>
<td>263.73</td>
<td>-0.2690</td>
<td>153.00</td>
</tr>
<tr>
<td>L_Age 39-48</td>
<td>-0.1854</td>
<td>39.18</td>
<td>-0.2919</td>
<td>308.92</td>
<td>-0.3048</td>
<td>208.14</td>
</tr>
<tr>
<td>L_Age 48-57</td>
<td>-0.2934</td>
<td>98.38</td>
<td>-0.2981</td>
<td>330.01</td>
<td>-0.3116</td>
<td>226.57</td>
</tr>
<tr>
<td>L_Age 57-67</td>
<td>-0.1067</td>
<td>16.13</td>
<td>-0.0449</td>
<td>8.18</td>
<td>-0.0811</td>
<td>17.32</td>
</tr>
<tr>
<td>L_Occup. - Farm</td>
<td>-0.0603</td>
<td>5.06</td>
<td>-0.0323</td>
<td>6.24</td>
<td>-0.0285</td>
<td>3.45</td>
</tr>
<tr>
<td>L_Tenure - Owner</td>
<td>0.2320</td>
<td>100.59</td>
<td>0.2189</td>
<td>336.13</td>
<td>0.2340</td>
<td>237.93</td>
</tr>
<tr>
<td>L_Tenure - Tenant</td>
<td>0.0930</td>
<td>12.29</td>
<td>0.1346</td>
<td>119.00</td>
<td>0.1594</td>
<td>90.65</td>
</tr>
<tr>
<td>L_Org. – Partner</td>
<td>0.2908</td>
<td>90.33</td>
<td>0.3357</td>
<td>576.56</td>
<td>0.3389</td>
<td>331.71</td>
</tr>
<tr>
<td>L_Org. – Incorp.</td>
<td>0.0695</td>
<td>4.85</td>
<td>0.1305</td>
<td>56.37</td>
<td>0.2055</td>
<td>57.96</td>
</tr>
<tr>
<td>L_Org. – Other</td>
<td>0.2769</td>
<td>7.70</td>
<td>0.2578</td>
<td>29.91</td>
<td>0.2814</td>
<td>17.58</td>
</tr>
<tr>
<td>log(L_Assets/Acre)</td>
<td>0.0162</td>
<td>0.77</td>
<td>-0.0515</td>
<td>30.99</td>
<td>-0.0467</td>
<td>15.96</td>
</tr>
<tr>
<td>L_Net Returns/Acre</td>
<td>0.00069</td>
<td>6.13</td>
<td>-1.3E-06</td>
<td>0.00</td>
<td>-4.4E-06</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Likelihood Ratio Test (H0: B=0)
Chi-Square (Pr > ChiSq)
Observations

Note: Dependent Variable: Exit (=1 if farm exits in current period, =0 otherwise). Coefficients in bold are significant at the 1% confidence level. ChiSq is the Chi Square statistic corresponding to the test of the null hypothesis that the estimated coefficient equals zero.
Table 6. Analysis of Effects for Logistic Model of Farm Exits

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Corn</th>
<th>Soybean</th>
<th>Cash grains</th>
<th>Cotton</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ChiSq</td>
<td>Pr&gt;</td>
<td>ChiSq</td>
<td>Pr&gt;</td>
<td>ChiSq</td>
<td>Pr&gt;</td>
</tr>
<tr>
<td>County fixed effects</td>
<td>158.3256</td>
<td>0.0014</td>
<td>623.925</td>
<td>&lt;.0001</td>
<td>843.3487</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>log(L_Farm Size)</td>
<td>24.7583</td>
<td>&lt;.0001</td>
<td>80.3832</td>
<td>&lt;.0001</td>
<td>54.9777</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Size fixed effects</td>
<td>5.5218</td>
<td>0.2378</td>
<td>19.8948</td>
<td>0.0005</td>
<td>13.4834</td>
<td>0.0091</td>
</tr>
<tr>
<td>L_Size * (L_Govt. Pay/Acre)</td>
<td>41.4105</td>
<td>&lt;.0001</td>
<td>36.2269</td>
<td>&lt;.0001</td>
<td>29.4889</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>5.2044</td>
<td>0.0225</td>
<td>16.5477</td>
<td>&lt;.0001</td>
<td>2.5754</td>
<td>0.1085</td>
</tr>
<tr>
<td>L_Age</td>
<td>110.3503</td>
<td>&lt;.0001</td>
<td>752.8878</td>
<td>&lt;.0001</td>
<td>395.4197</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Occup</td>
<td>5.0574</td>
<td>0.0245</td>
<td>6.2414</td>
<td>0.0125</td>
<td>3.4453</td>
<td>0.0634</td>
</tr>
<tr>
<td>L_Tenure</td>
<td>100.7995</td>
<td>&lt;.0001</td>
<td>362.8001</td>
<td>&lt;.0001</td>
<td>255.96</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Org.</td>
<td>96.6609</td>
<td>&lt;.0001</td>
<td>613.1316</td>
<td>&lt;.0001</td>
<td>370.8797</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>log(L_Assets/Acre)</td>
<td>0.7676</td>
<td>0.3809</td>
<td>30.988</td>
<td>&lt;.0001</td>
<td>15.9567</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>L_Net Returns/Acre</td>
<td>6.1271</td>
<td>0.0133</td>
<td>0.0007</td>
<td>0.9792</td>
<td>0.0078</td>
<td>0.9296</td>
</tr>
</tbody>
</table>

Note: The **ChiSq** is the Chi Square statistic associated with the test of the null hypotheses that all embodied effects jointly equal zero.