Factors Influencing Exit Rate of US Farms

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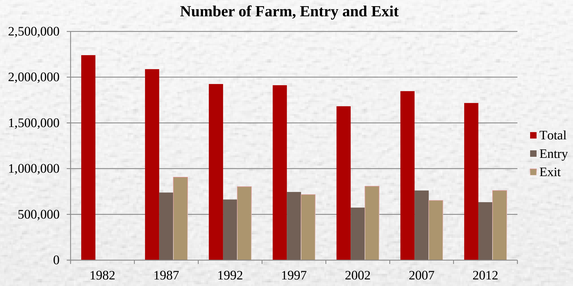
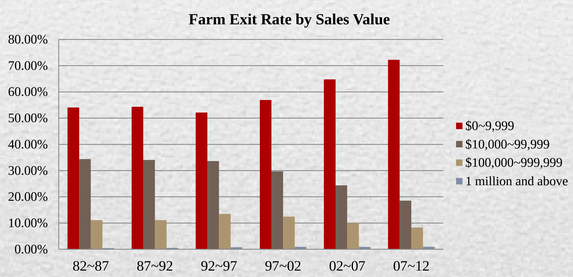
Overview

USDA conducts mandatory census survey every 5 year. According to the report the total amount of farms drops to 1,717,898 in 2012, which is 23.34% less then that in 1982. The number of farm exits varies from 906,100 to 652,597 during this 30 years





Objective

To identify factors that influence farm exit the US market among all farm and farmer characteristics.

Table 1. Survival rates for all farms.

Year	1982	1997	1992	1997	2002	2007	2012
1982	100.00%	60.14%	40.12%	27.51%	17.79%	12.42%	8.67%
1987	.	100.00%	62.01%	41.59%	26.80%	18.77%	13.28%
1992	.	.	100.00%	63.25%	39.81%	27.61%	19.56%
1997	.	.	.	100.00%	58.17%	38.93%	27.12%
2002	.	.	.	.	100.00%	61.18%	40.97%
2007	.	.	.	.	.	100.00%	59.19%

Results

Table 2. Factors influencing farm exit: logit marginal effect with weithed data.

		Marginal Effect					
Variable		**82-87**	**87-92**	**92-97**	**97-02**	**02-07**	**07-12**
Intercept		0.019108***	-0.10901***	-0.17451***	-0.12235***	-0.15916***	-0.19797***
Age		0.001108***	0.00306***	0.00299***	0.00327***	0.00233***	0.00269***
Sales Value(1,000)		-3.22E-05***	-1.48E-05***	-2.06E-05***	-2.30E-05***	-4.96E-05***	-4.62E-05***
Land in farm		-4E-06***	-0.00001***	-2.99E-06***	-1.93E-07	-2.04E-07	-0.00001***
Government payment(1,000)			-1.22E-03***	-1.36E-03***	-3.26E-03***	-1.05E-03***	-1.43E-03***
Gender (male)	female	0.056567***	0.05788***	0.04554***	0.06702***	0.05658***	0.05453***
Race (White)	Asian	-0.0405***	-0.0067	-0.00993	-0.01107	0.04766***	0.01098
	Black	0.058477***	0.03259***	0.04751***	0.03855***	0.04749***	0.0433***
	India	0.028864***	-0.00039	0.0018	-0.00602	-0.03235***	-0.02262***
	Other	-0.00924*	0.02907*	-0.00824	0.02701**	-0.02989**	-0.01726*
Days off farm (0 day)	Jan-99	0.000824	-0.00695***	-0.00345**	-0.00255	-0.01085***	0.00767***
	100-199	-0.00858***	0.00397**	-0.00816***	-0.00879***	-0.00076	-0.0148***
	200+	-0.0127***	-0.00661***	-0.01109***	-0.01531***		
Type (Other animal)	Grains & Oil Seeds	0.011141***	0.05785***	0.01755***	0.0181***	0.03249***	0.014***
	Vegetables & Melons	0.013348***	0.02531***	0.02325***	0.01842***	0.05501***	0.01837***
	Fruits, Tree nuts & Berries	0.030282***	0.118***	0.06857***	0.08339***	0.08468***	0.10388***
	Horticultural	0.064016***	0.02684***	0.02692***	0.04366***	0.01169**	0.01571***
	Tobacco	-0.03494***	-0.04059***	-0.03078***	-0.00665	0.00776	-0.03064***
	Cotton	0.076008***	0.00056	0.06325***	0.0329***	-0.00547	-0.04682***
	Other Crops	0.004354***	0.0258***	0.00126	0.00844***	0.02238***	0.04191***
	Beef Cattle	-0.0434***	-0.03442***	-0.04135***	-0.03133***	-0.03118***	-0.03906***
	Dairy	-0.0664***	-0.03813***	-0.0178***	-0.04187***	0.01322***	-0.00052
	Hogs	-0.0034**	-0.03199***	-0.01737***	-0.03087***	-0.05024***	0.00257
	Poultry and Eggs	0.021886***	0.01517***	0.01784***	-0.03404***	-0.0258***	-0.01023**
	Sheep, goats wool	-0.0461***	-0.07639***	-0.05347***	-0.04926***	-0.0995***	-0.05493***
Region(Southern)	Appalachian	-0.01753***	-0.03394***	-0.01591***	0.00498	-0.00933**	0.00028
	corn belt	-0.03765***	-0.03538***	-0.01247***	-0.00546	-0.03502***	-0.01808***
	delta state	0.032477***	0.02766***	0.0411***	0.06717***	0.06945***	0.06097***
	lake state	-0.00053	-0.00527	-0.00039	-0.03268***	-0.03768***	-0.0391***
	mountain	-0.00892***	0.00678	0.02092***	-0.01115***	0.03777***	0.01684***
	northeast	0.007868***	-0.03821***	-0.04699***	-0.02494***	-0.01931***	-0.03439***
	northern plains	-0.04244***	-0.00981**	0.00213	-0.00806**	0.01309***	0.0207***
	other	0.031669***	0.07453*	-0.02785	-0.03005	-0.09231**	-0.08258**
	pacific	0.013105***	0.02883***	0.02785***	0.03394***	0.05005***	0.03609***
	southeast	0.039415***	0.00538	0.01038**	0.00801*	0.01413***	0.02772***
Occupation (non-farming)	farming	-0.04564***	-0.03227***	-0.02419***	-0.03219***	-0.01844***	-0.02213***
Organization(Partnership)	family	-0.07103***	-0.0852***	-0.0791***	-0.06908***	-0.04612***	-0.04081***
	incorporation	-0.00948***	-0.04104***	-0.04211***	-0.00916***	-0.03727***	-0.028***
	other	0.051032***	0.09671***	0.08024***	0.06059***	0.07785***	0.06017***
*p<.1, **p<.05, ***p<.01							

Data

- Census of Agriculture Longitudinal File generated by National Agricultural Statistics Service (NASS).
- Seven censuses data contained: 1978, 1982, 1987, 1992, 1997, 2002, 2007 and 2012.
- Each record in the longitudinal file contains information on one farm business activity and characteristics of its operator ever since it entered the market.
- 6,076,132 observations in total.

Method

The Logit Model

$$\ln\left(\frac{P_{it}}{1-P_{it}}\right) = Y = \beta' X_{it} + \varepsilon_{it}$$

Where,

- X_it is a vector of exogenous variables for the ith farm in time period t,
- β is a vector of parameters to be estimated,
- ε_it is a stochastic error term.

Results

- In table 2, marginal effects for each variable are listed period by period. It can be interpreted as, take age in 82-87 for example, with one year older operator, farm is 0.001108 more likely to exit the market.
- It is clear that age has significant positive effect on probability of exit in all periods while sales value, government payment and land size have opposite effect. In other words, older farmers are more likely to leave the market it may be explained by the truth, the older a farmer is the more likely will he retire. .
- Compare to sales value, Government payment has even larger influence. The same amount of government payment decreases the probability of exiting much more than sales value.
- Comparing to male operators, female has 0.05 more probabilities to exit which means sex significantly matters. Which tells the same story with Hoppe and Korb[1].

Conclusions

- Farms with older operators are more likely to drop.
- Gender matters. Female operators are more likely to exit the market.
- Operators take farming as their main occupation is much less likely to exit.
- Both sales value and government payment helped farms to stay in business.

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References

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