



United States Department of Agriculture

Credit and the Determinants of Beginning Farmer Success

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The findings and conclusions in this presentation are those of the author and should not be construed to represent any official USDA or U.S. Government determination or policy.



How to measure farm business success?

- Financial performance: business liquidity, solvency, profitability, efficiency (Mishra et al. 2009; Kropp and Katchova, 2011; Katchova and Dinterman, 2018)
- Farm business survival (exits) or growth rates (Katchova and Ahearn, 2016; Williamson, 2017; Nadolnyak et al. 2019)



How to measure farm business success?

- Definition of success should recognize importance of both survival and growth
 - Not exiting does not necessarily mean succeeding
 - A reduction in farm size may indicate insufficient profits to meet loan obligations, had to liquidate assets to remain in business.
 - Growth implies that the business owner invested in the operation and had positive expectations of future earnings.
- For this study, “success” defined as surviving in business over five years with non-negative farm asset growth



How can credit affect beginning farmer success?

- Help households cope with income shocks
 - Can increase longevity of farm business (survival rate)
- Allow for purchase of land and inputs
 - Can increase farm size (growth rate)
- Can raise productivity and profits (through economies of scale, new technology adoption)
 - Can increase financial performance
 - Higher profits increase survival and growth rates



Beginning farmers and credit constraints

- Beginning farmers have strong demand for credit
 - Lack land, buildings and machinery
 - Smaller scale operations – need to attain economies of scale
 - Younger principal operator – longer investment time horizon
- But beginning farmers more likely to be credit constrained
 - Many lenders ration loans based on borrower's income
 - Many loans require collateral (savings)
- To what extent do credit constraints limit success of beginning farmers?



Data

- 2007, 2012, 2017 Census of Agriculture, farm-level data
- Match farms 2007-12, 2012-17 and pool
- Limit sample to beginning farms
 - Principal operator reported 10 or fewer years of farming experience in the initial period
- 645K BFs farms observed in either initial year with no missing data
- 324K that survived for at least 5 years

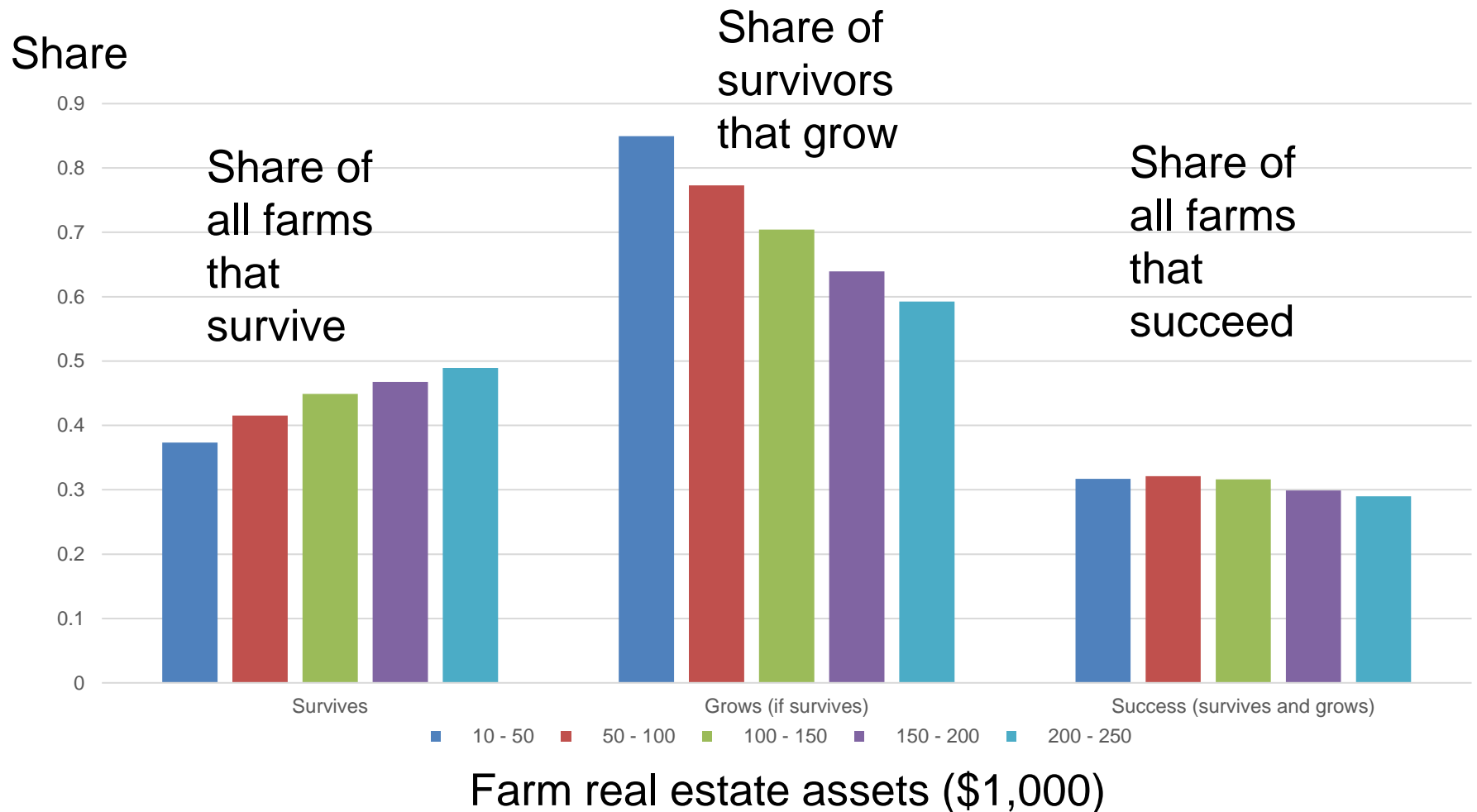


Performance of small BFs by farm/farmer type

- Survival rate = Share of all farms with principal operator who responded in following Census
- Positive growth rate = Share of surviving farms that had non-negative asset growth between Censuses
- Success rate = Share of all farms that survived and had non-negative growth
- Small farms
 - Less than \$250,000 farm real estate assets
 - About 269K farms observed in initial year, 119K survivors

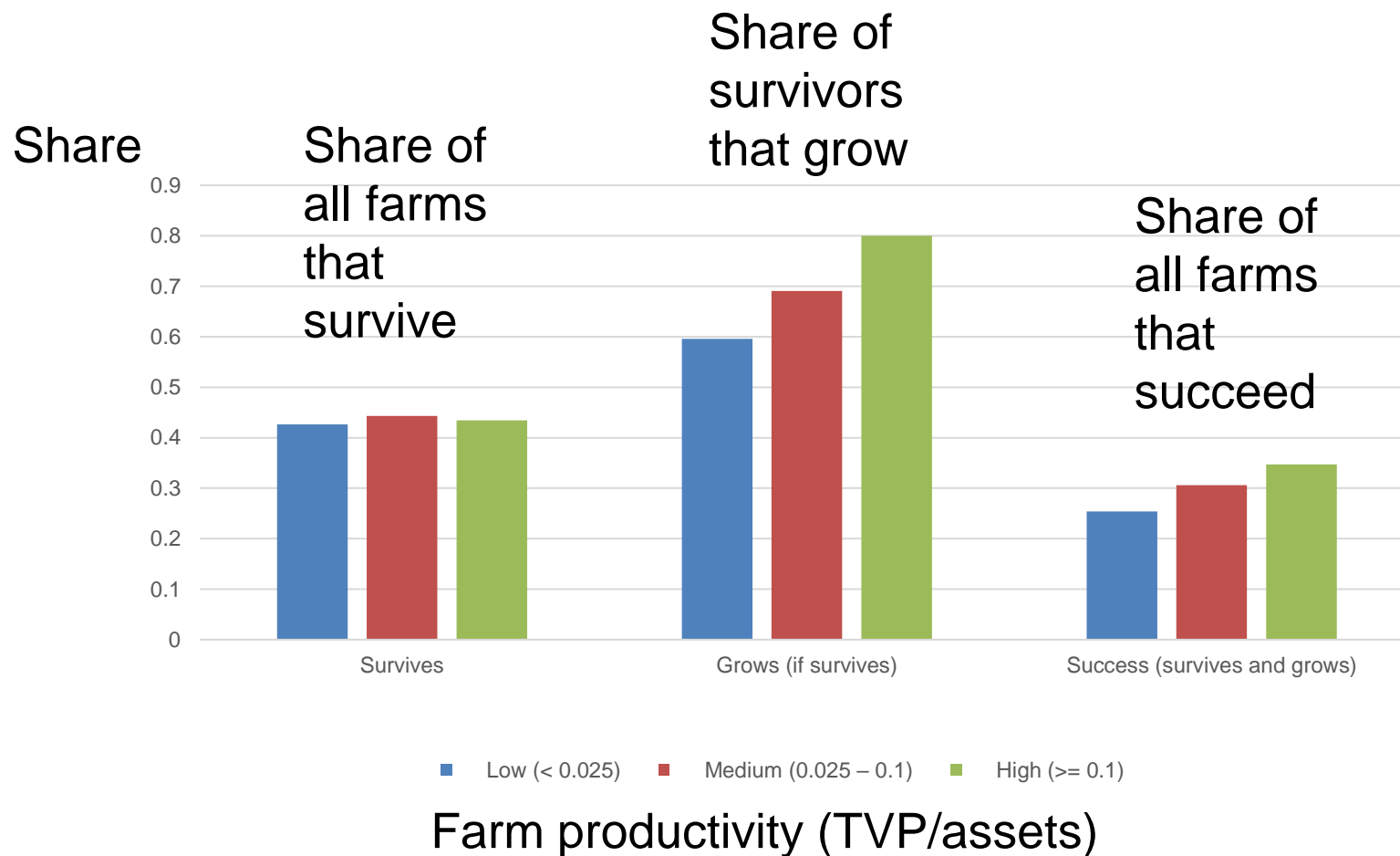


Among small BFs, survival rate increases with farm size; Positive growth rate decreases



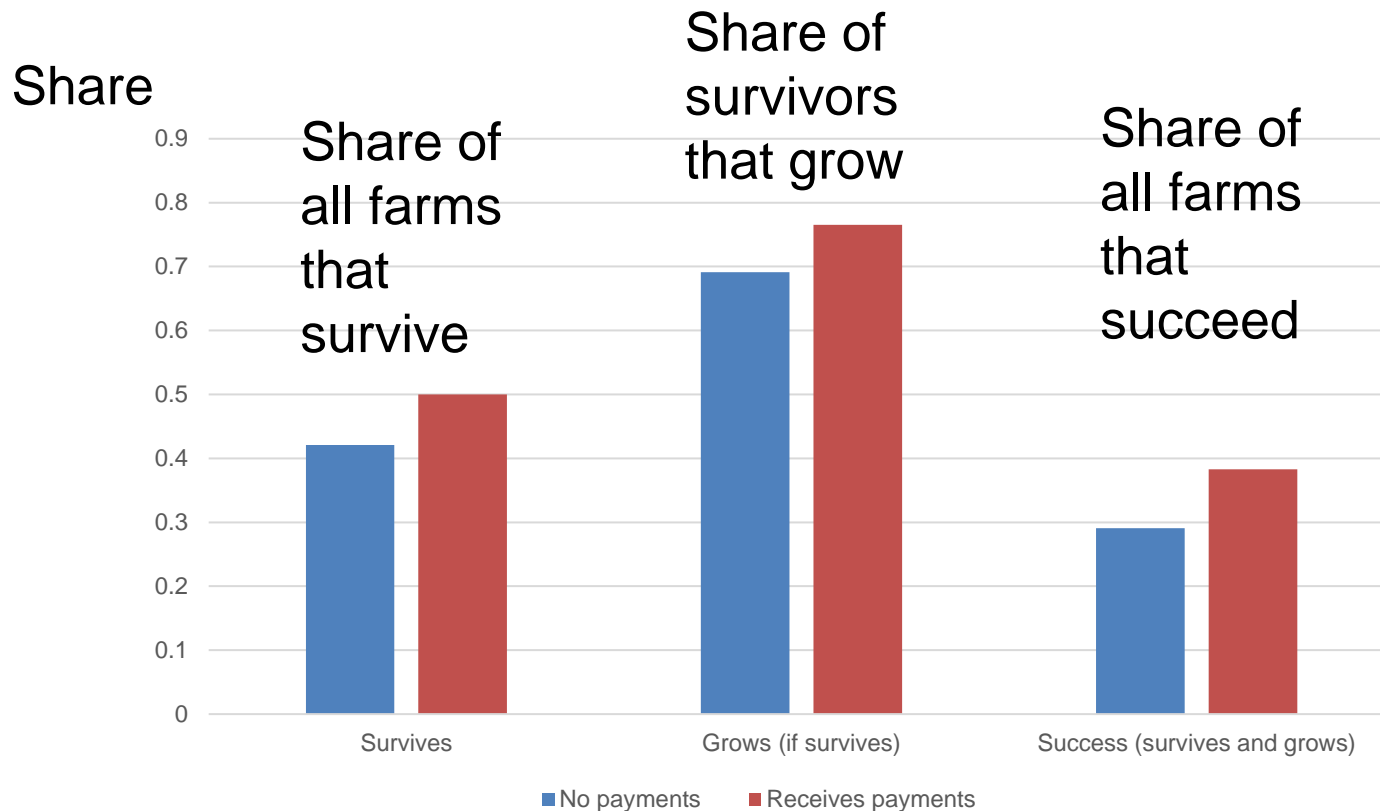
Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Among small BFs, higher farm productivity associated with positive growth and success



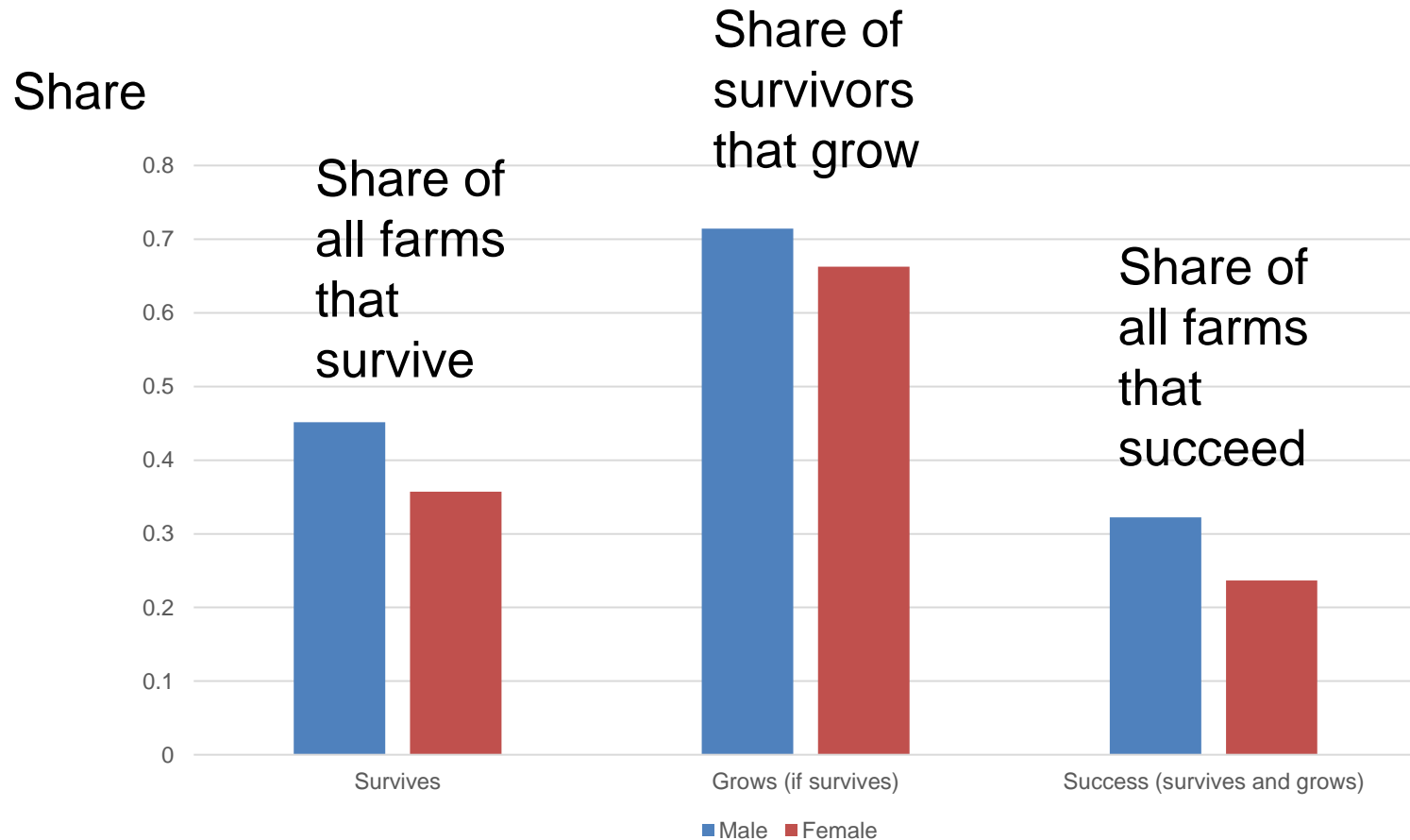
Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Among small BFs, those receiving government agricultural payments more likely to survive, grow and succeed



Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Among small BFs, male operators have higher survival, positive growth, and success rates



Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

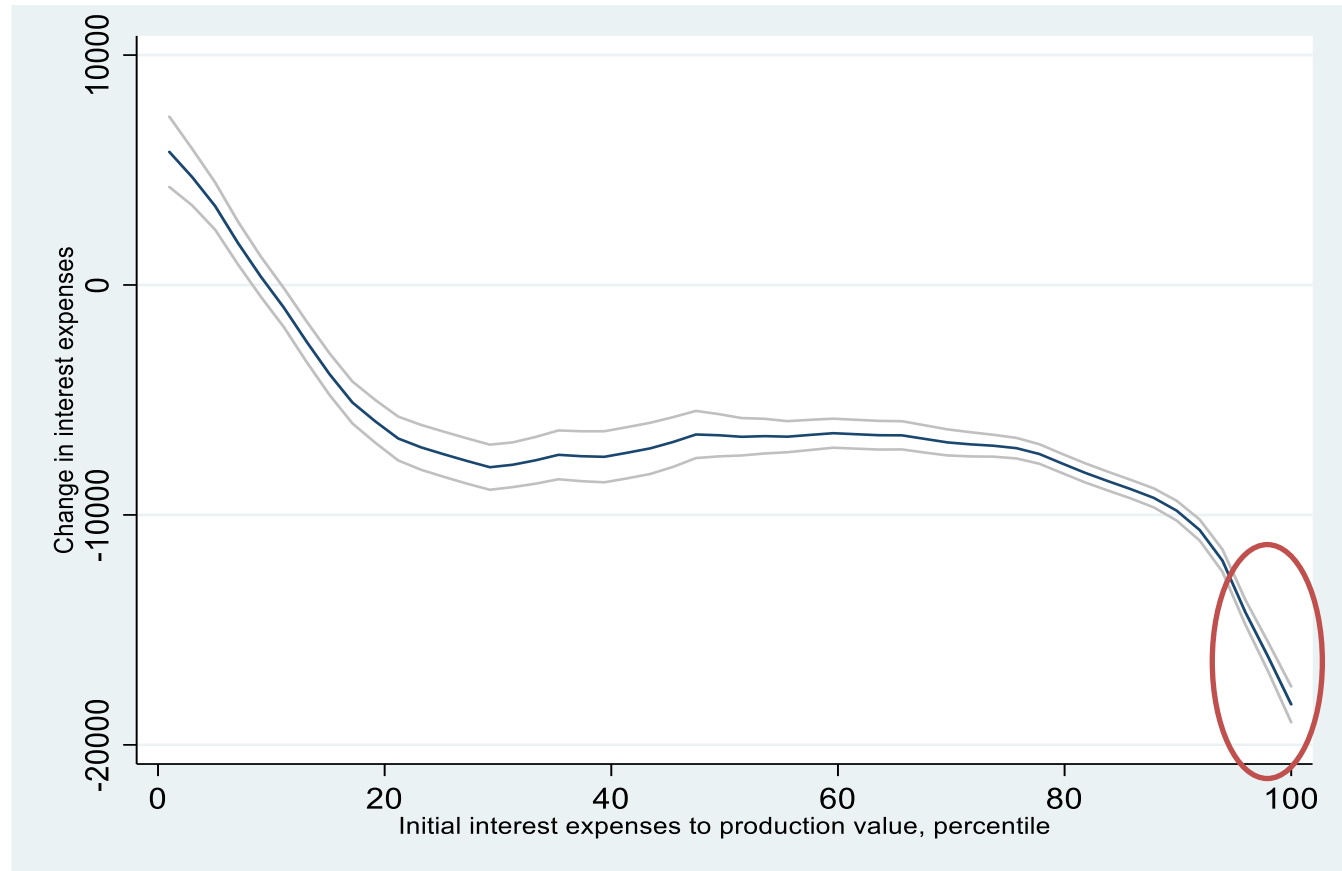
How to estimate whether a business is credit constrained?

- Financial measures correlated with access to external financing (Angelini and Generale, 2008; Musso and Schiavo, 2008; Bottazzi, Secchi and Tamagni, 2014)
- This study uses a high interest expense ratio as indicator of credit constraint
 - Interest expense ratio = interest expenses to total value of production
 - Indicates level of debt relative to ability to pay debt
 - Top 5% of beginning farmers are considered credit constrained



Among surviving BFs, those with highest interest expense ratio have smallest increase in debt over next 5 years

5-year
change in
interest
expenses
(\$)



Initial interest expenses to production value, percentile

Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Regression models

- Dependent Variables

- Change in interest expenses (change in borrowing)
- Survival
- Growth rate
- Success (farm survives and has non-negative growth)

- Independent variables

- Credit constraint indicator
- Farm size (assets), tenancy arrangements, government payments, productivity measure, DTC sales, family farm
- Operator age, primary occupation, gender, race
- Year, ERS region, county unemployment rate change



Estimated effect of credit constraint over 5 years for all and small beginning farms

	Beginning farms	
	All	Small
Change in interest expenses	-6,719*** (-211)	-4,768*** (-107)
Survival probability	-0.113*** (0.008)	-0.095*** (0.013)
Growth rate	-0.102*** (0.009)	-0.076*** (0.017)
Success probability	-0.175*** (0.009)	-0.136*** (0.014)

Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Conclusions

- Possible groups to target if policymakers want to direct resources at beginning farmers with lower levels of farm business success:
 - Those who not receive government agricultural payments
 - Those with lower farm productivity
 - Producers of: “Horses, ponies, mules, burros and donkeys”; “Vegetables, melons, potatoes”; “Hogs and pigs, poultry and eggs”
 - Socially disadvantaged racial groups
 - Women
- Possible mechanisms to raise success rates:
 - Increased access to agricultural program payments
 - Increased farm productivity



Conclusions

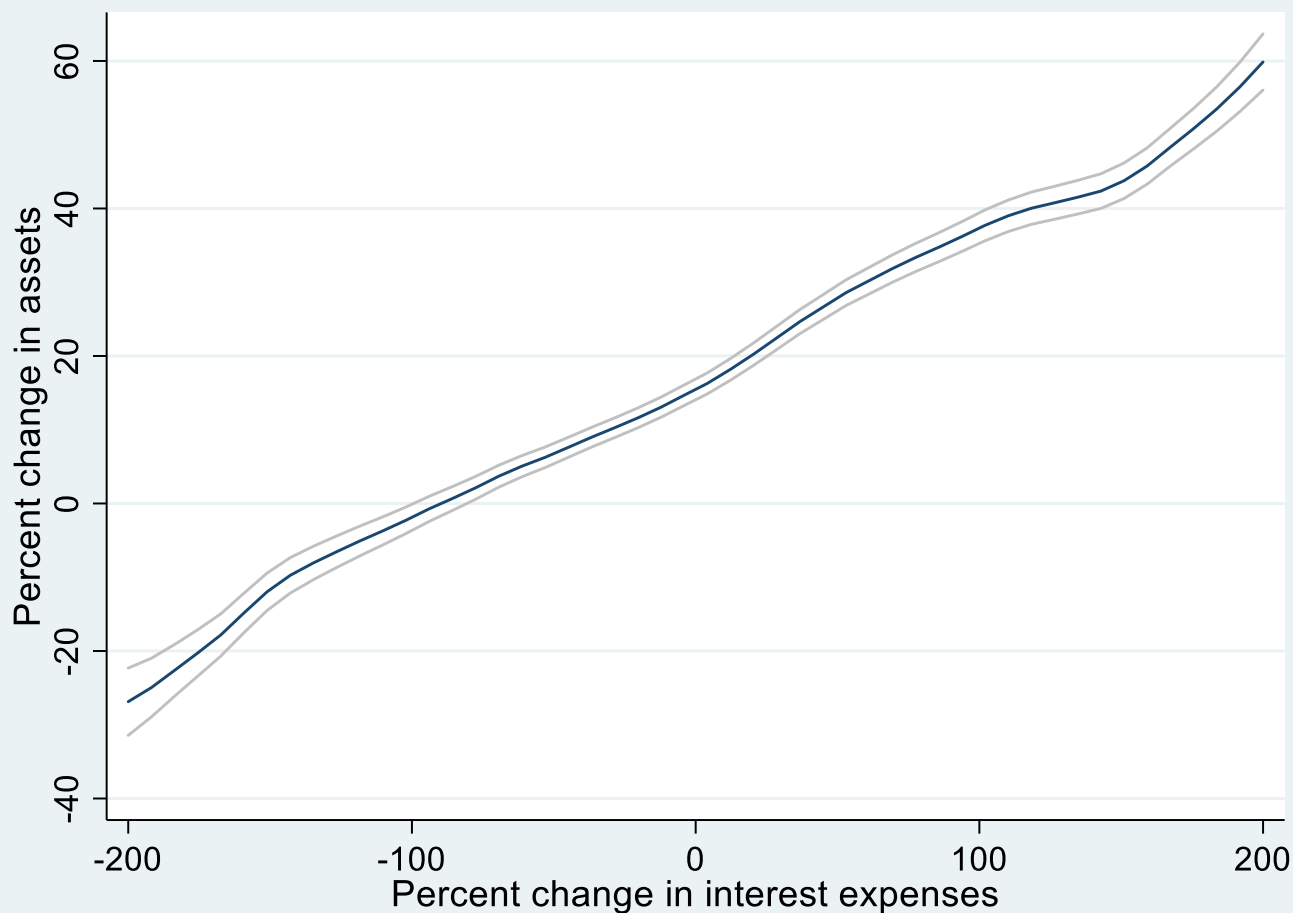
- Results suggest policies that relieve credit constraints could significantly improve outcomes for beginning farmers
 - Increase farm survival, growth, and success rates
 - less strict collateral and/or income requirements for loans?
- Results suggest USDA efforts to promote credit access for beginning farmers have benefits



Thank you!

Supplemental slides below

Change in debt is correlated with change in farm size



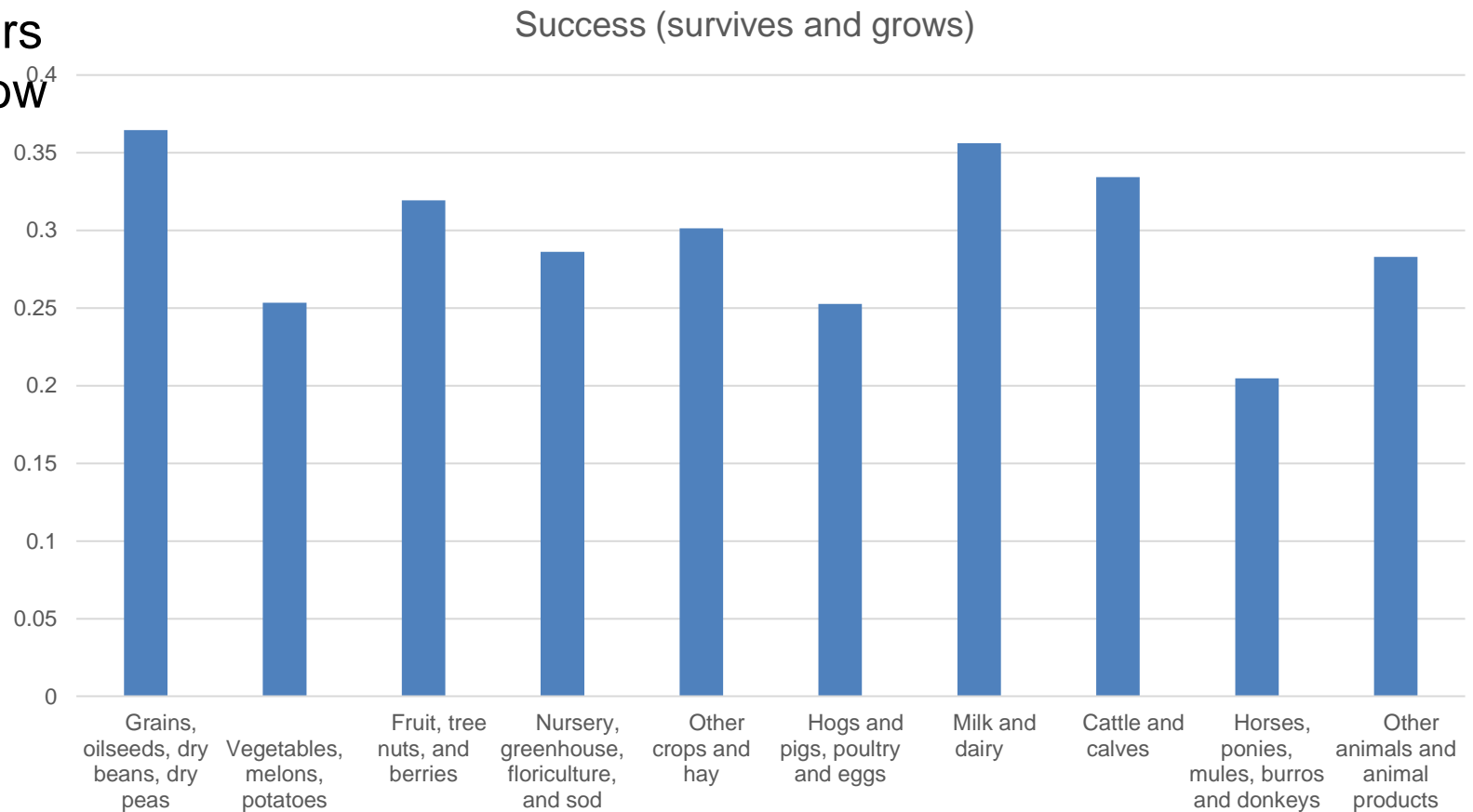
Estimated effect of credit constraint over 5 years by operator age, small beg. farms

	Small beg. farms	
	Over 40	Under 40
Change in interest expenses	-4957*** (102.3)	-4306*** (268.5)
Survival probability	-0.092*** (0.015)	-0.097*** (0.024)
Growth rate	-0.047*** (0.019)	-0.146*** (0.032)
Success probability	-0.121*** (0.016)	-0.164*** (0.025)

Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

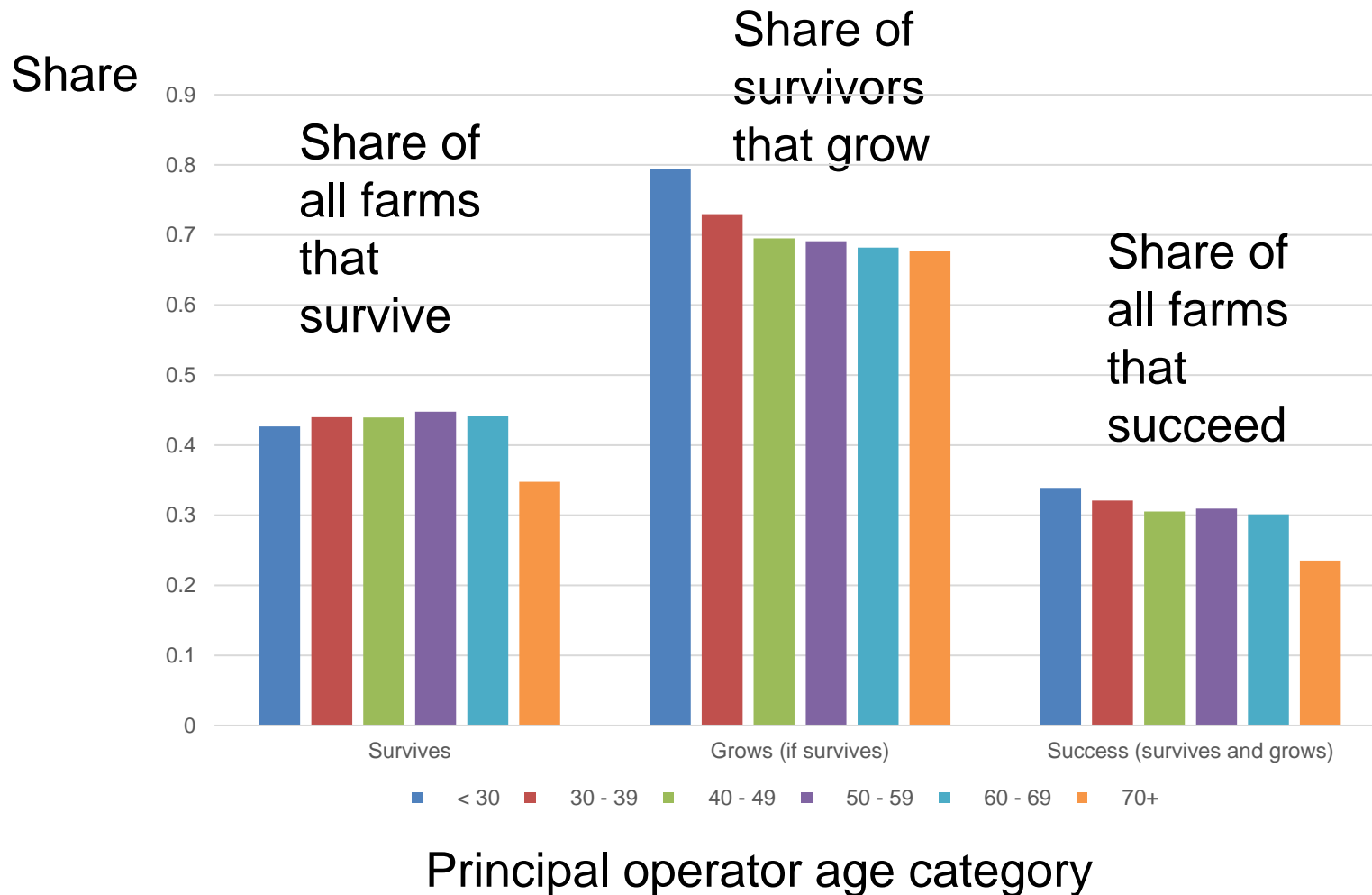
Small BF success rate highest for “grains and oilseeds”; lowest for “horses”

Share of survivors that grow



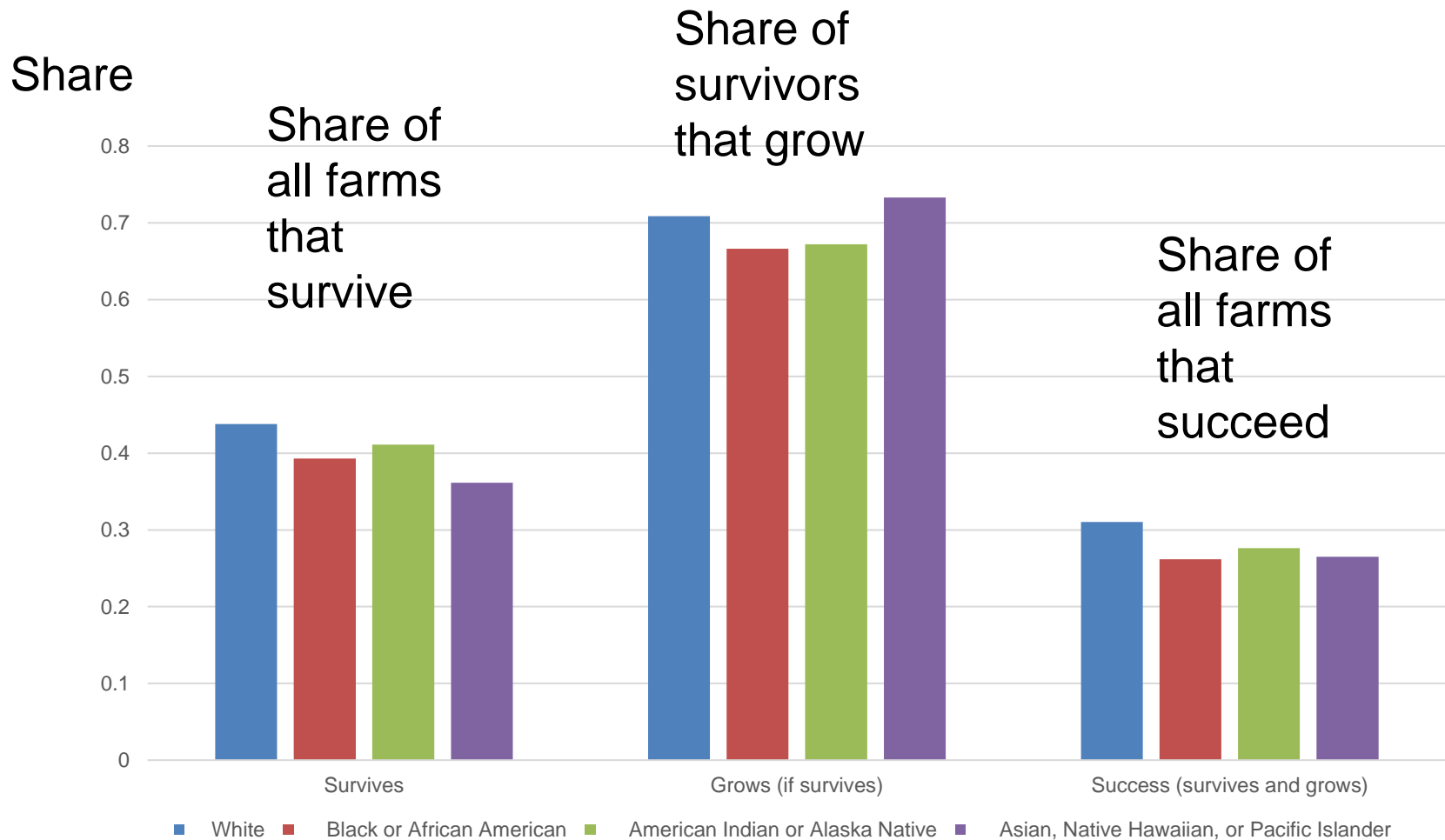
Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Among small BFs, oldest operators have lowest survival rates; Youngest most likely to grow



Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

Among small BFs, operators from socially disadvantaged groups have lower business success rates



Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture