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Credit and the Determinants of Beginning Farmer Success

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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?

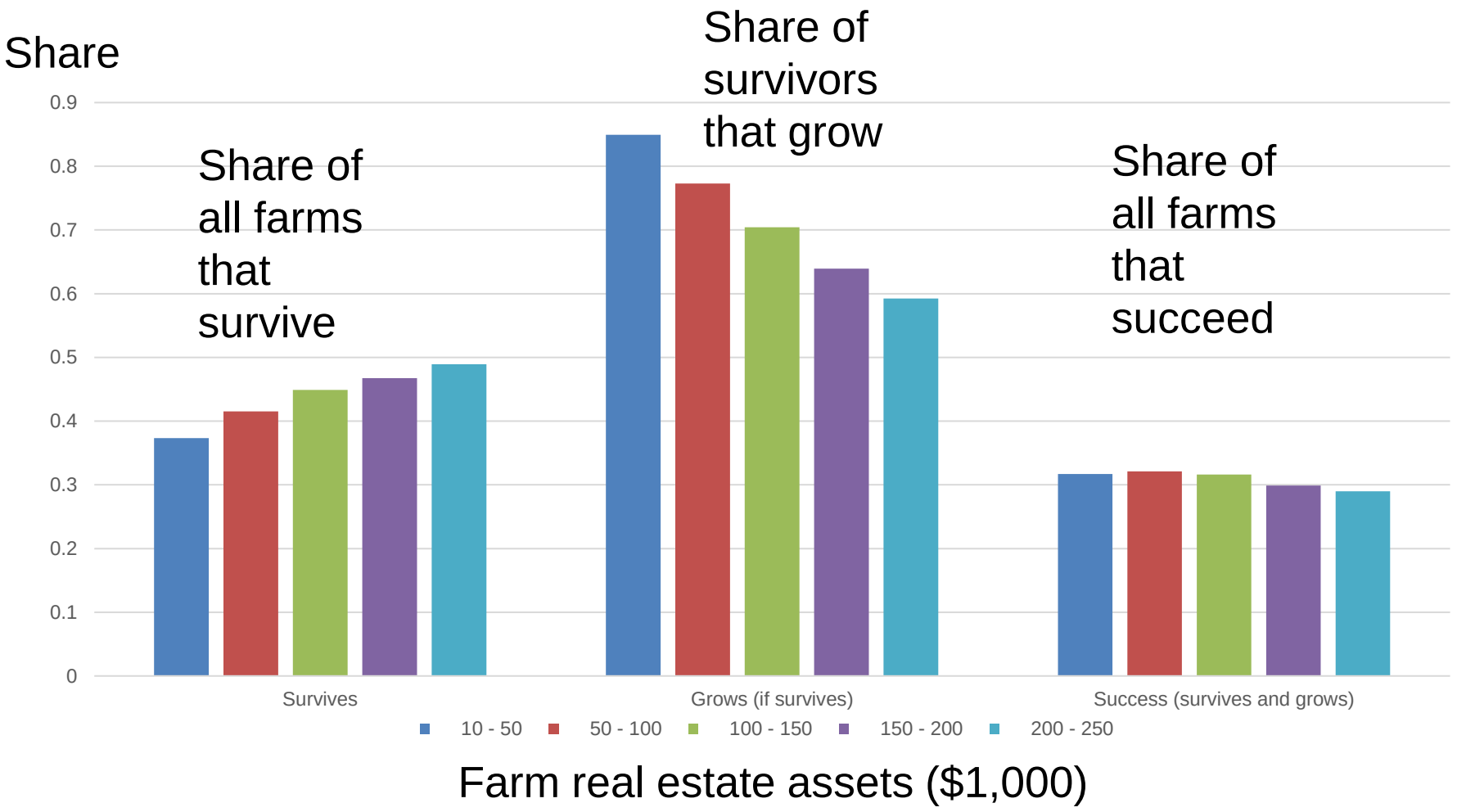
Data

- 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

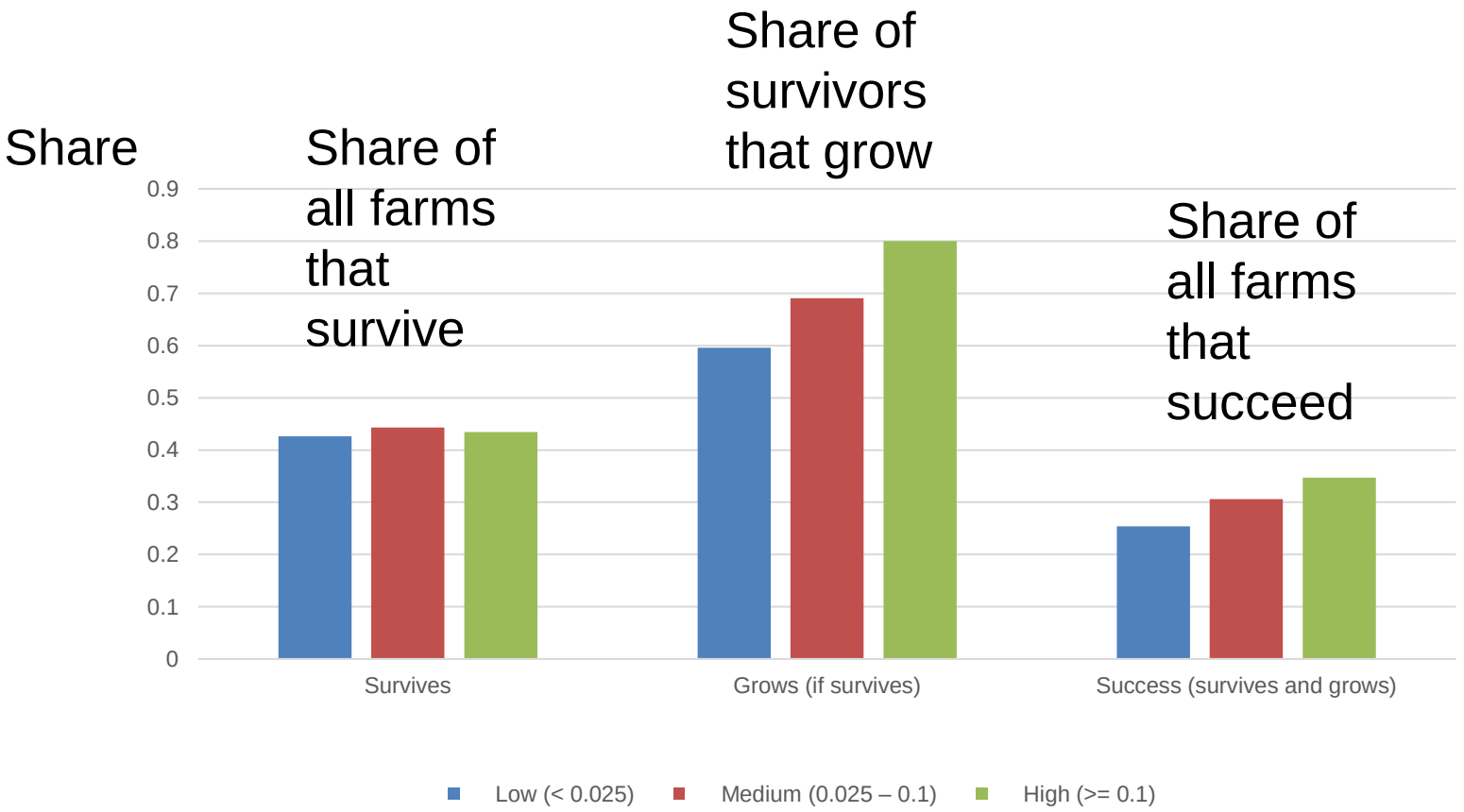
- Survival rate = Share of all farms with principal operator who responded in following Census
- Positive growth rate = Share of surviving farms that had non-negative asset growth between Censuses
- Success rate = Share of all farms that survived and had non-negative growth
- Small farms
  - Less than $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



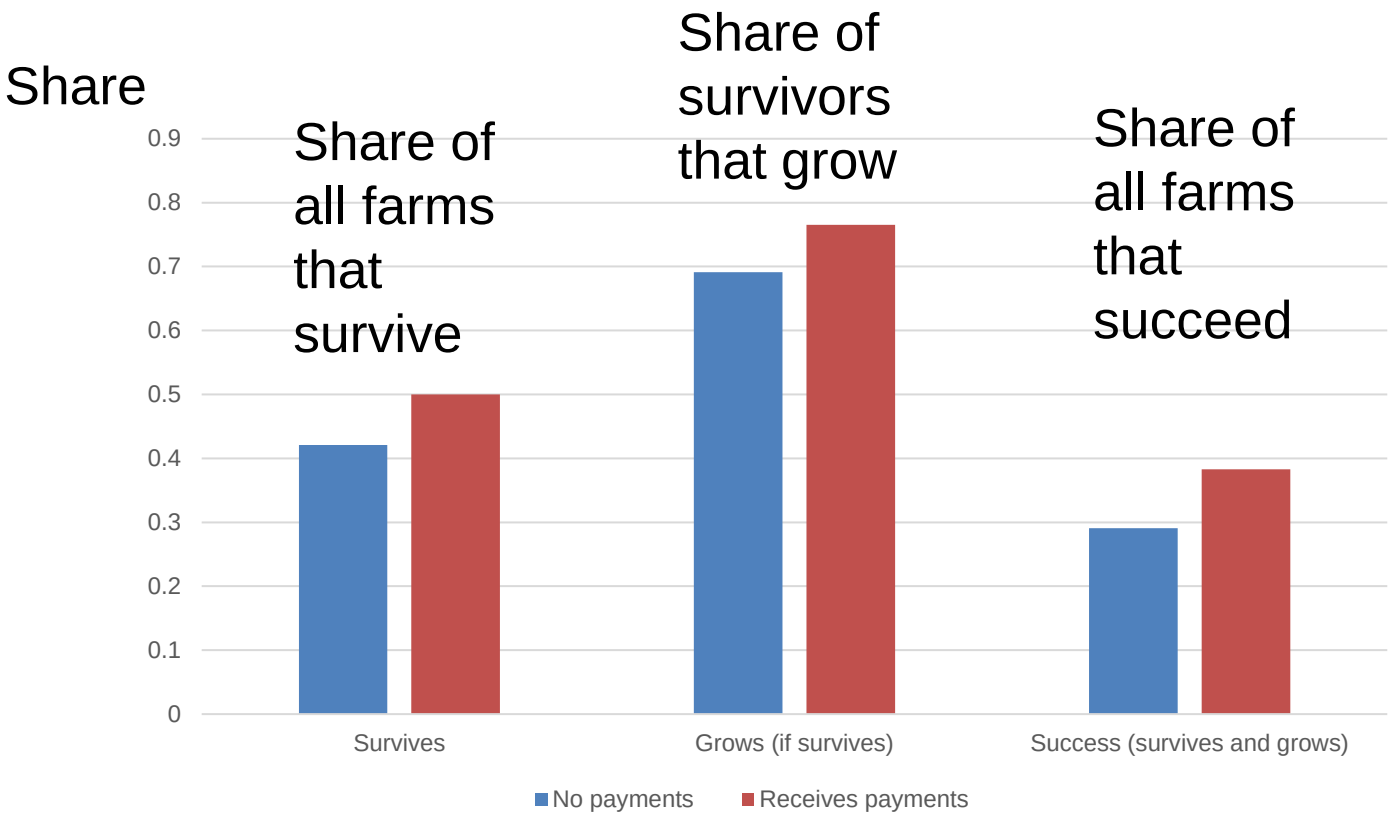
Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

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



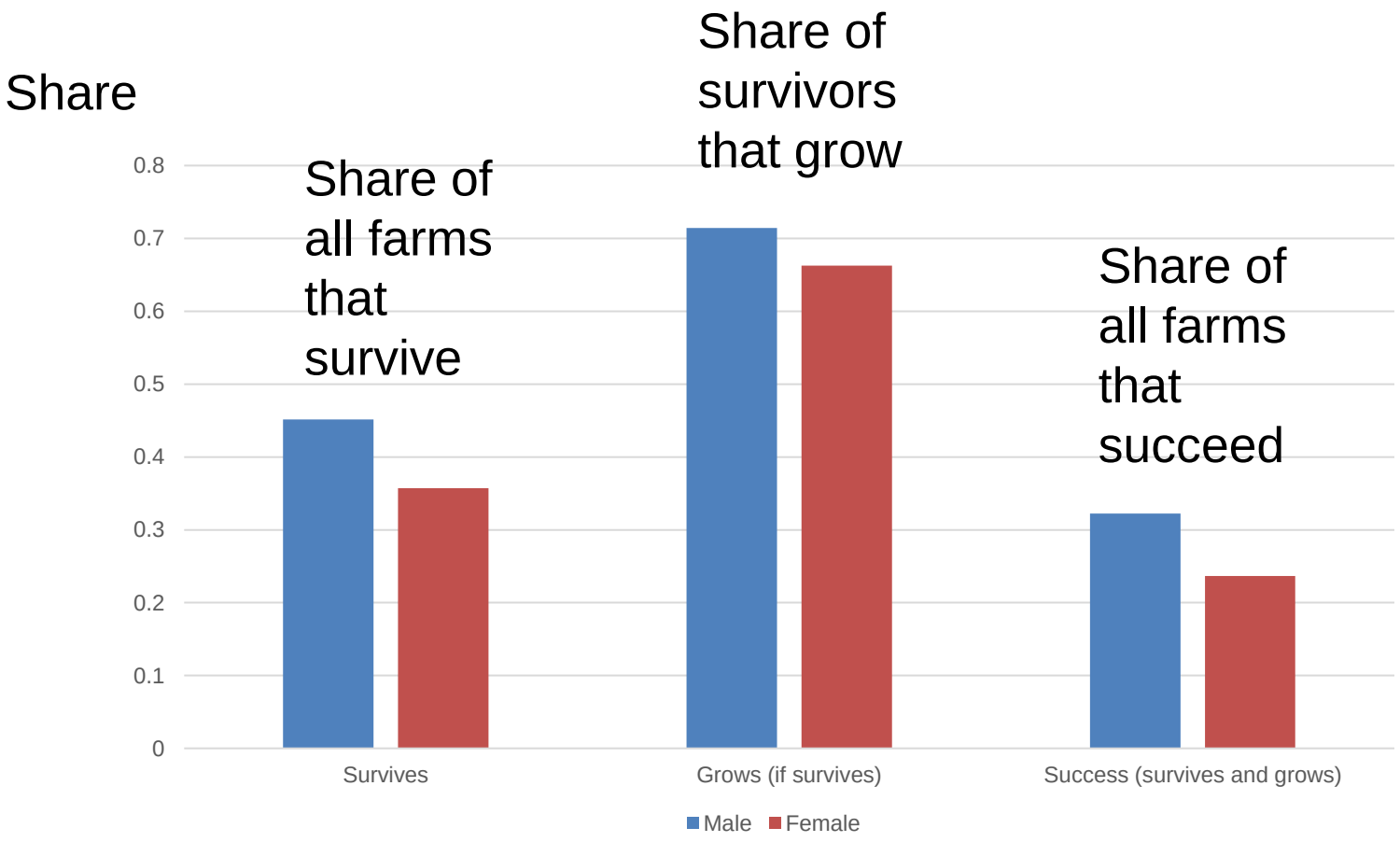
Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

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



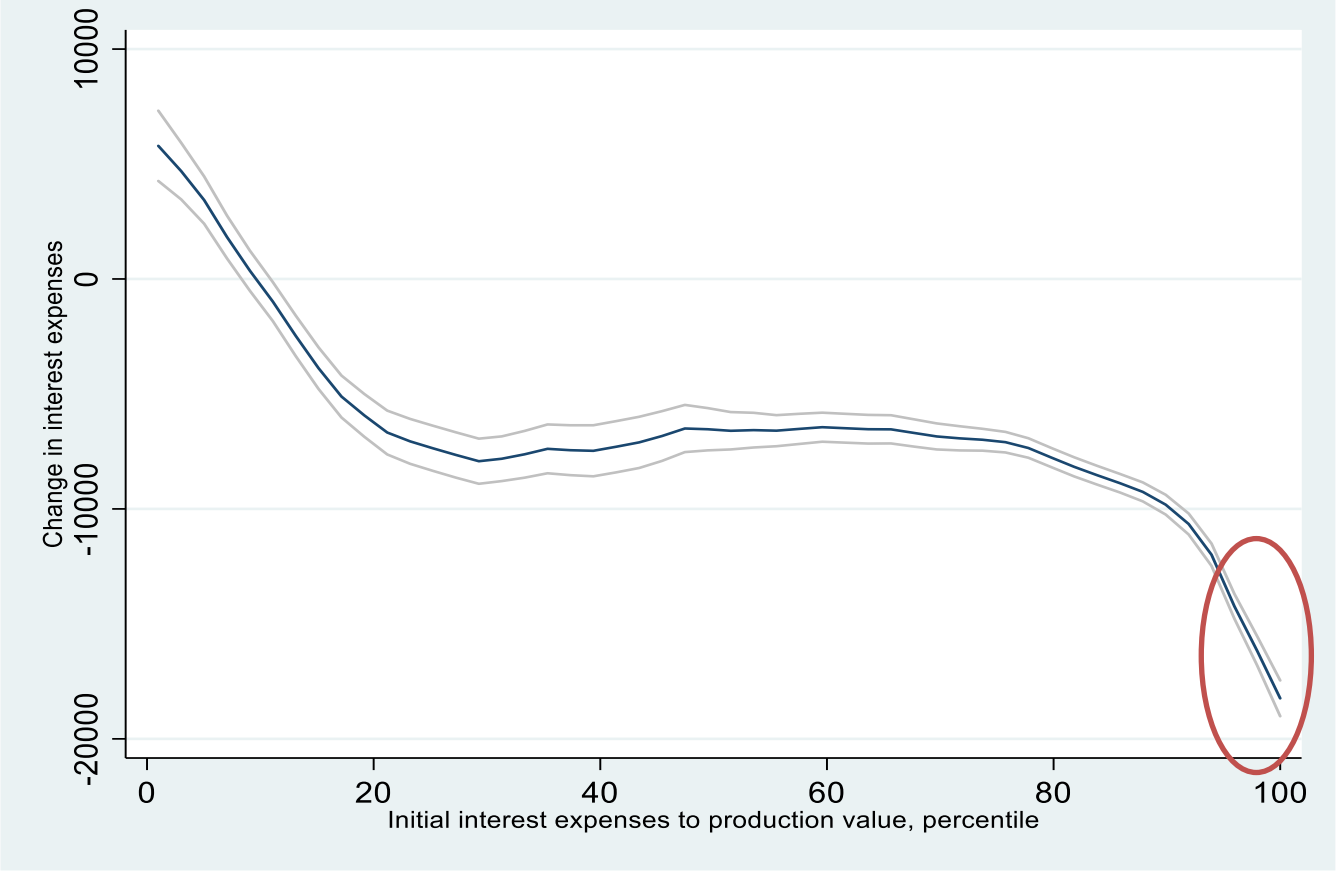
Source: Author's calculations using data from the 2007, 2012, 2017 Census of Agriculture

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

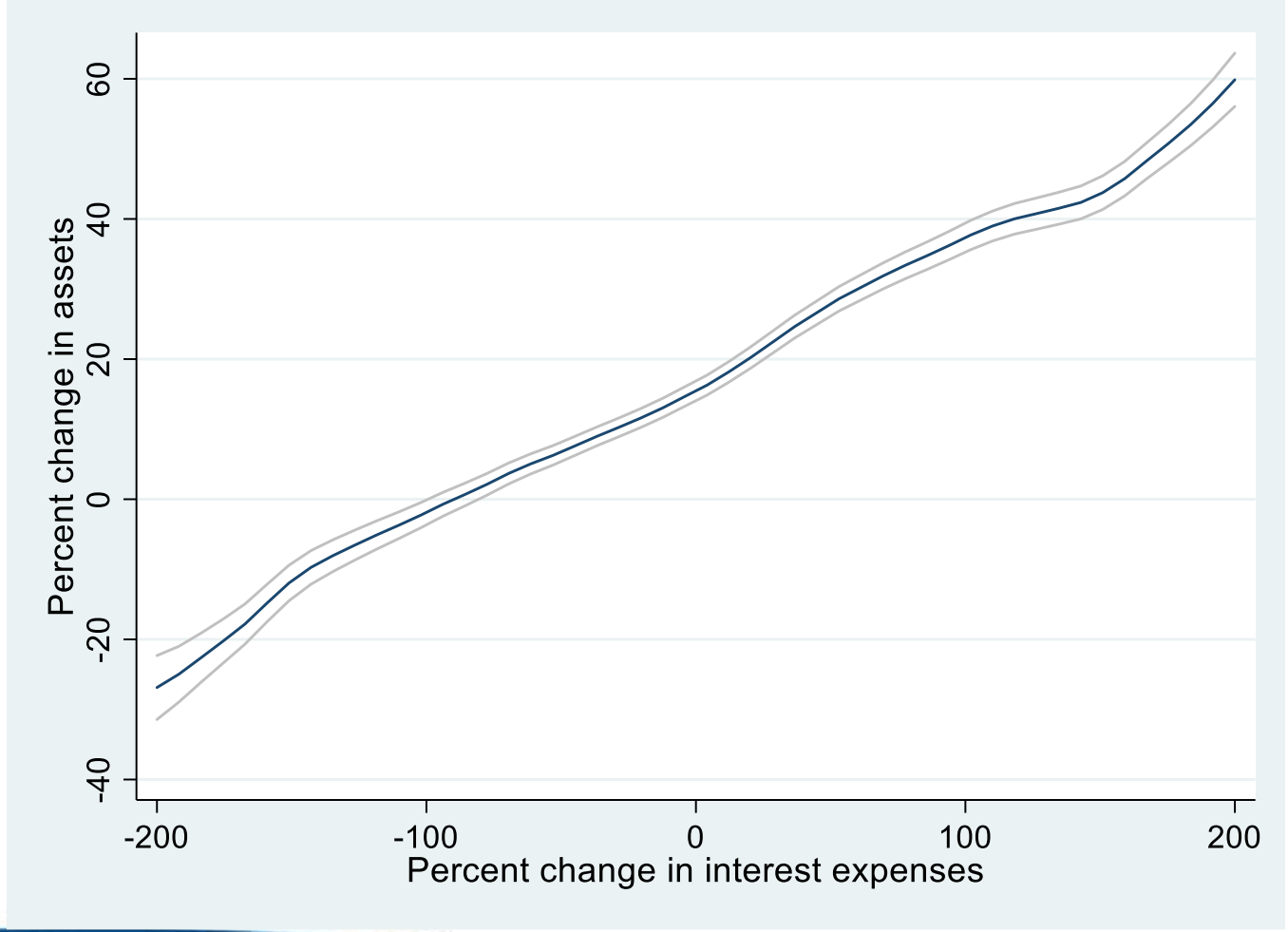
Conclusions

- 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



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

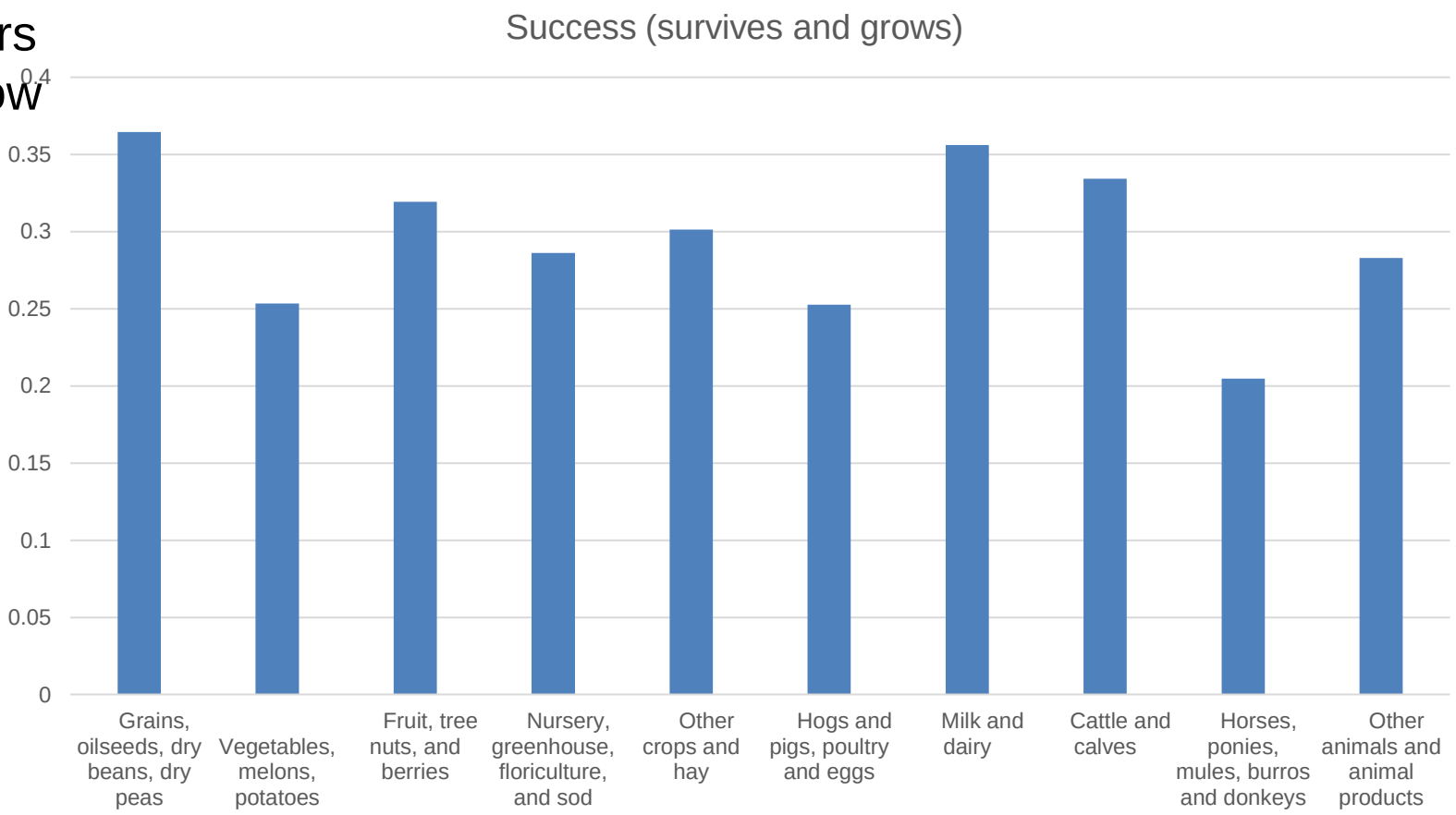
Estimated effect of credit constraint over 5 years by operator age, small beg. farms

	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

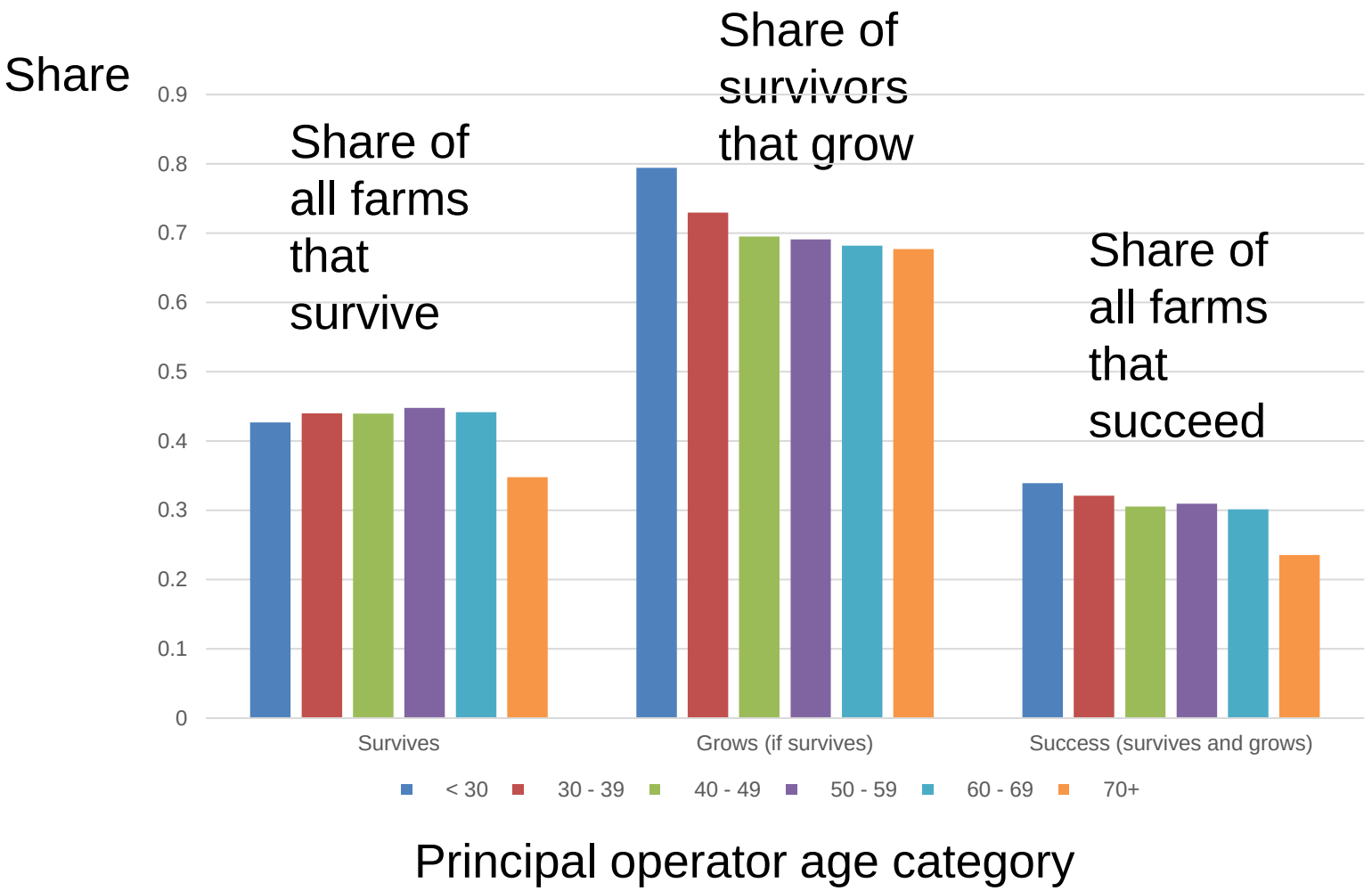
Small BF success rate highest for “grains and oilseeds”; lowest for “horses”

Share of survivors that grow



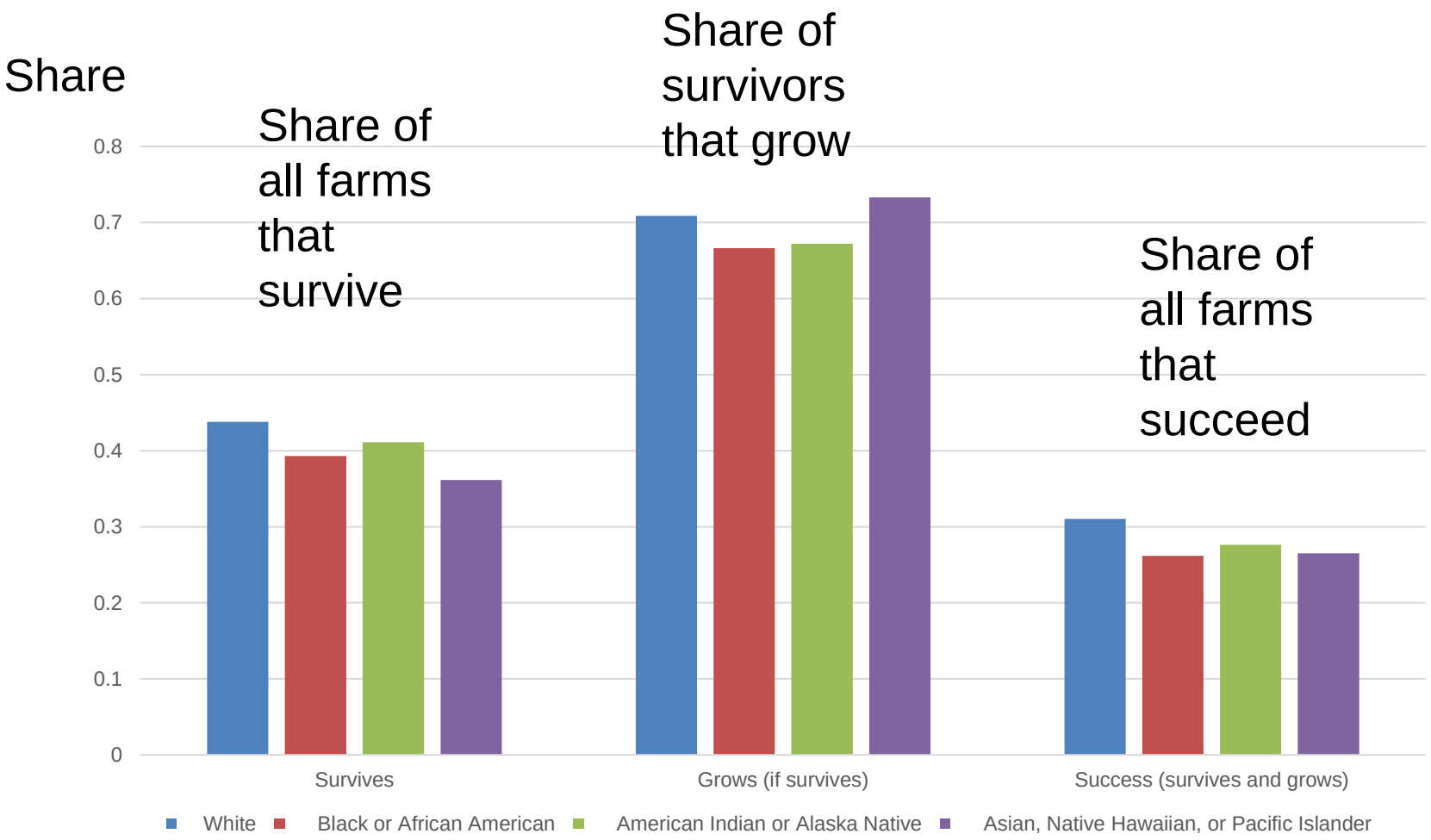
Source: Author’s calculations using data from the 2007, 2012, 2017 Census of Agriculture

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



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