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# Measuring Duration in a Life Cycle Analysis of U.S. Agricultural Cooperatives

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# Background on the topic

- A number of authors have hypothesized the presence of a life cycle in cooperatives (LeVay, 1983; Cook 1995; Fulton, 1995; Valentinov, 2007; Ortmann and King, 2007; Francesconi and Ruben, 2008).
  - So far, no empirical evidence that it actually exists
- Some theses / essays but no complete look like you would find in Miller and Friesen (1984)
- I believe it exists; but it has never been looked at beyond theory
  - Penrose (1952) and Haire (1959) used evolutionary science model
- Many of these empirical studies are linked with corporate strategic orientation (Chandler, 1962), organizational effectiveness (Hanks et al., 1993), management priorities (Miller and Friesen, 1984), organizational behavior (Mitzenberg, 1984) and executive compensation (DeAngelo, DeAngelo, and Stulz; 2006, 2010).

# Objective

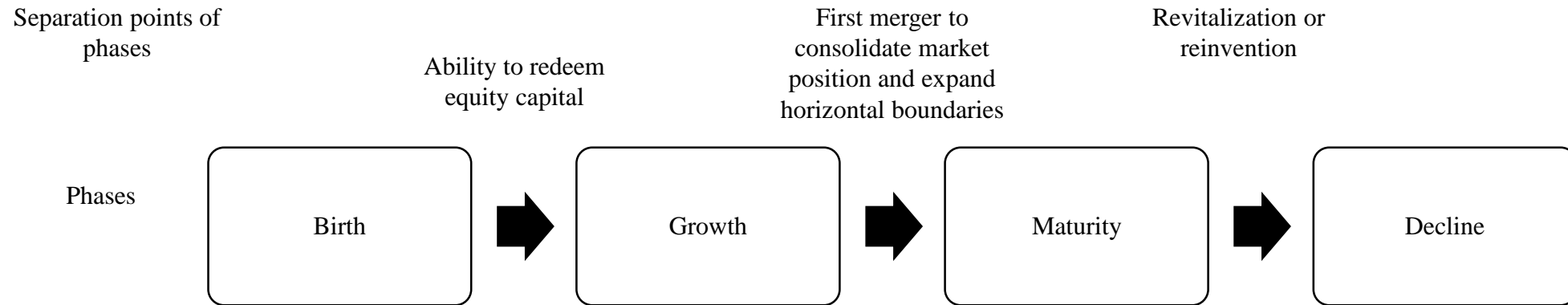
- The objective is to provide evidence for a classic four phase life cycle in U.S. agricultural cooperatives and determine the duration of the first three phases.
- Why? Some EU colleagues would suggest that they thought US cooperatives were all demutualizing or changing to a different structure. I did not believe that but decided to see for myself what the data said

# Industrial Organization Literature: empirical

- Risch, Boland, and Crespi (2014) note that three methods have been used in the empirical industrial organization literature on entry and exit
  - Case studies
  - Descriptive analysis of entry and exit using longitudinal firm and plant specific data
- Greiner (1972) described five phases of growth and suggests that organizations may pursue strategies that proved effective in the past but may become inappropriate or ineffective as the firm evolves over time.
- Lester, Parnell, and Menefee (2008) summarize the literature on the number of phases found in a life cycle and find research suggesting three, four, five, and ten phases with four being by far the most common.



# How am I measuring duration?



Not concerned with Decline since my data are all survivors. Marketing and Mixed (Purchasing/Marketing) in this data

# How am I measuring duration

- Corporate reports include articles of incorporation, bylaws, board meeting minutes, audits, and similar type information were some of the sources. Published histories are written books.
- Digital content includes any information found digitally in the internet.
- Other written information includes written reports, theses or dissertations, case studies, or other published research. Personal interviews include phone calls and electronic communications with employees or directors.
- Personal relationships matter!



# Duration

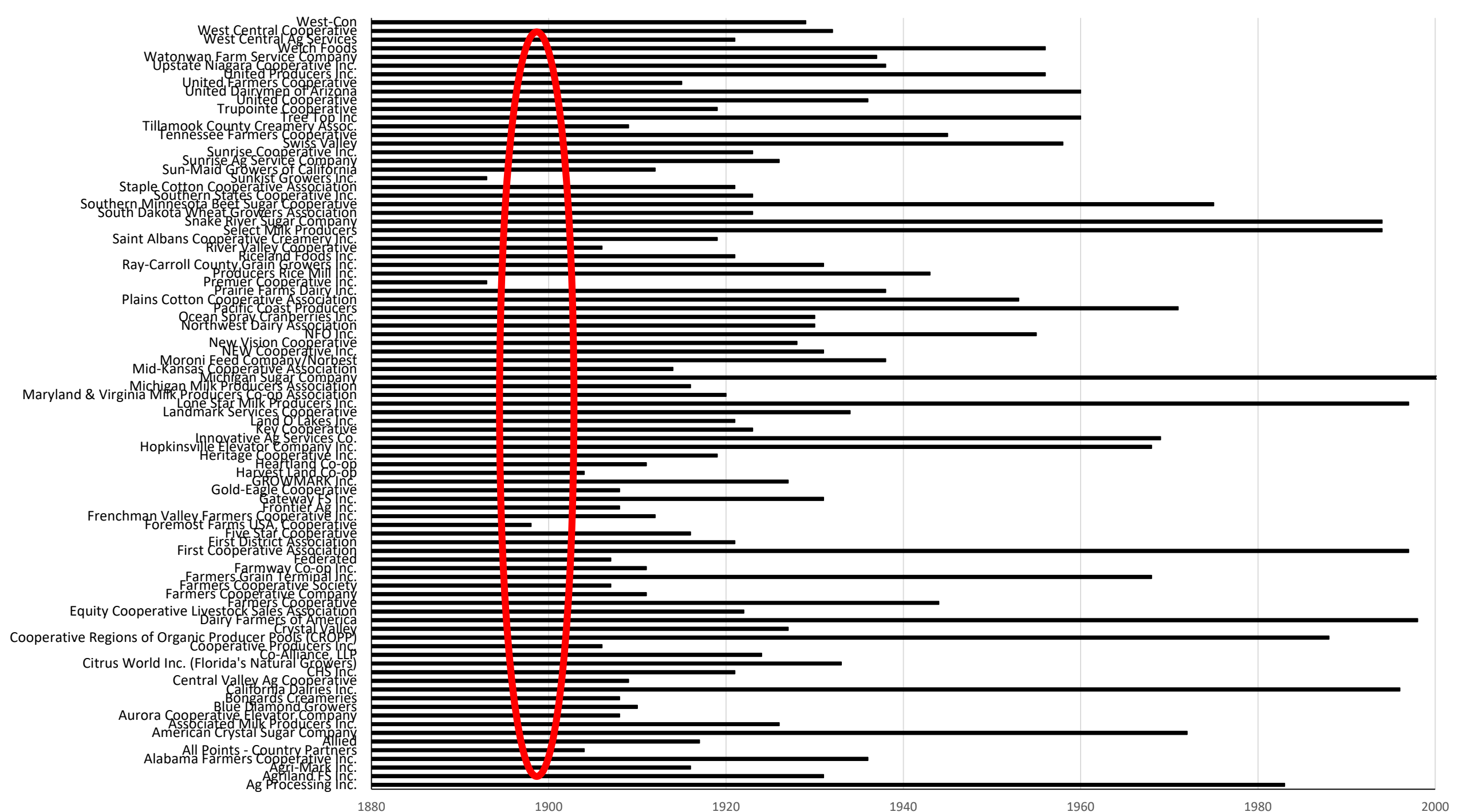
- The beginning of the birth phase is chosen to be the year in which the cooperative was formed. The conclusion of that phase is chosen to be the year when the cooperative first redeemed equity or formalized a policy in writing regarding equity redemption to its members.
- The duration of the growth phase is chosen to end at a point where the cooperative entered into a merger with a neighboring cooperative that consolidated market share and significantly expanded the horizontal boundaries of the cooperative. Significant is defined as the year of the first merger or acquisition where the asset size and sales volume of the cooperative grew by more than 25%; the cooperative did not undergo a dramatic name change; and the cooperative expanded beyond its original geographical boundaries.
- The end of the maturity phase was defined as the time when significant changes to its patronage policy or equity redemption policies that happened two years in a row or three out of five years. Generally speaking, the decline point was reached shortly thereafter where a merger that changed the name (in most cases), portfolio of businesses, or resulted in significant changes to its governance documents. The midpoint of these years was chosen as the end of the maturity phase.

# Data

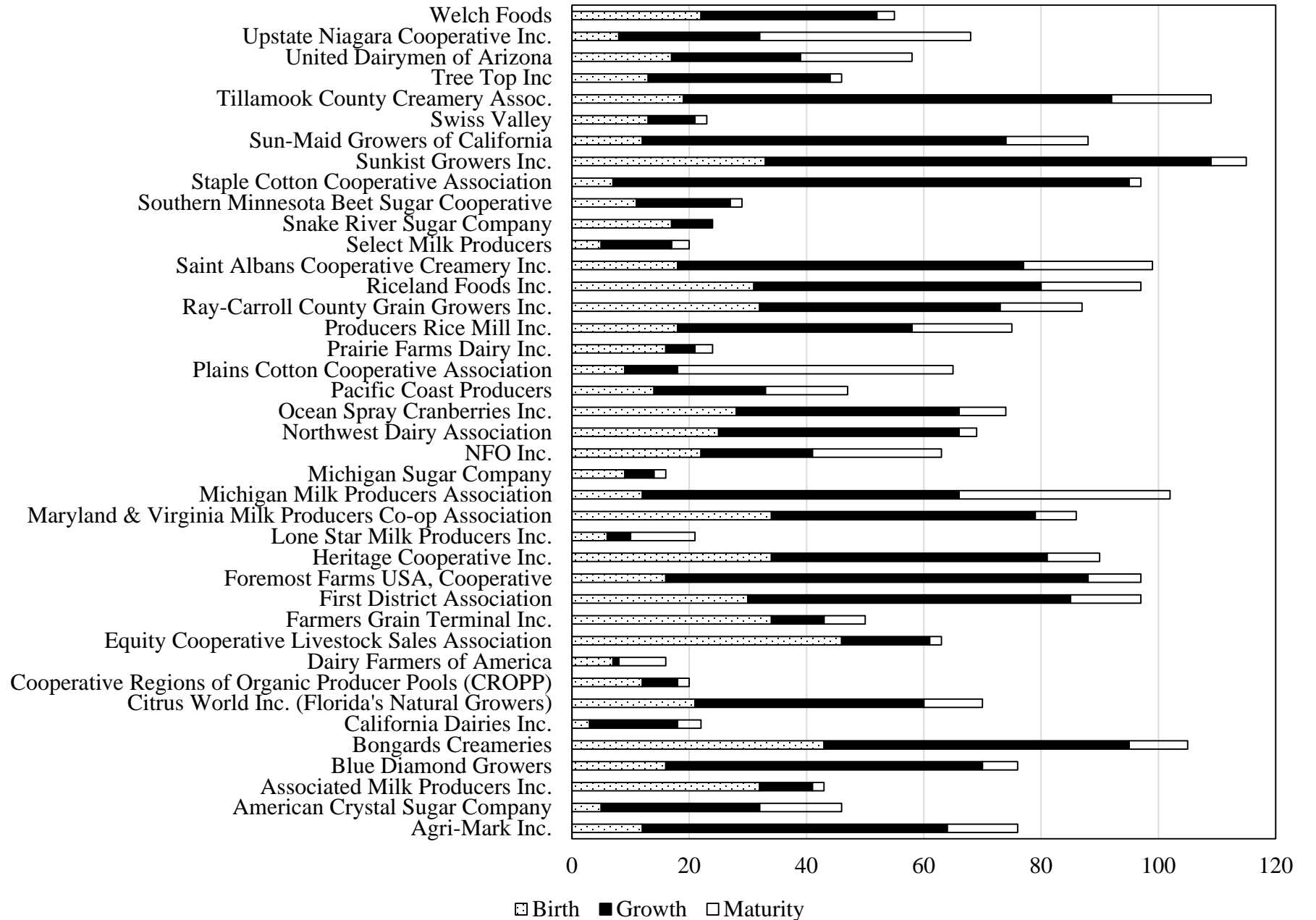
- The U.S. Department of Agriculture (USDA) Rural Development (2014) reports that there were 2,106 agricultural cooperatives in 2014 with almost 2 million memberships in the United States.
- In 2014, the top 100 agricultural cooperatives based on sales volume comprise 72% of the total number of agricultural cooperative sales volume and 67% of all assets.
- USDA lists the top 100 cooperatives that have the majority of cooperative memberships, sales, and assets.

# Example Calculation of Duration: CHS, Inc.

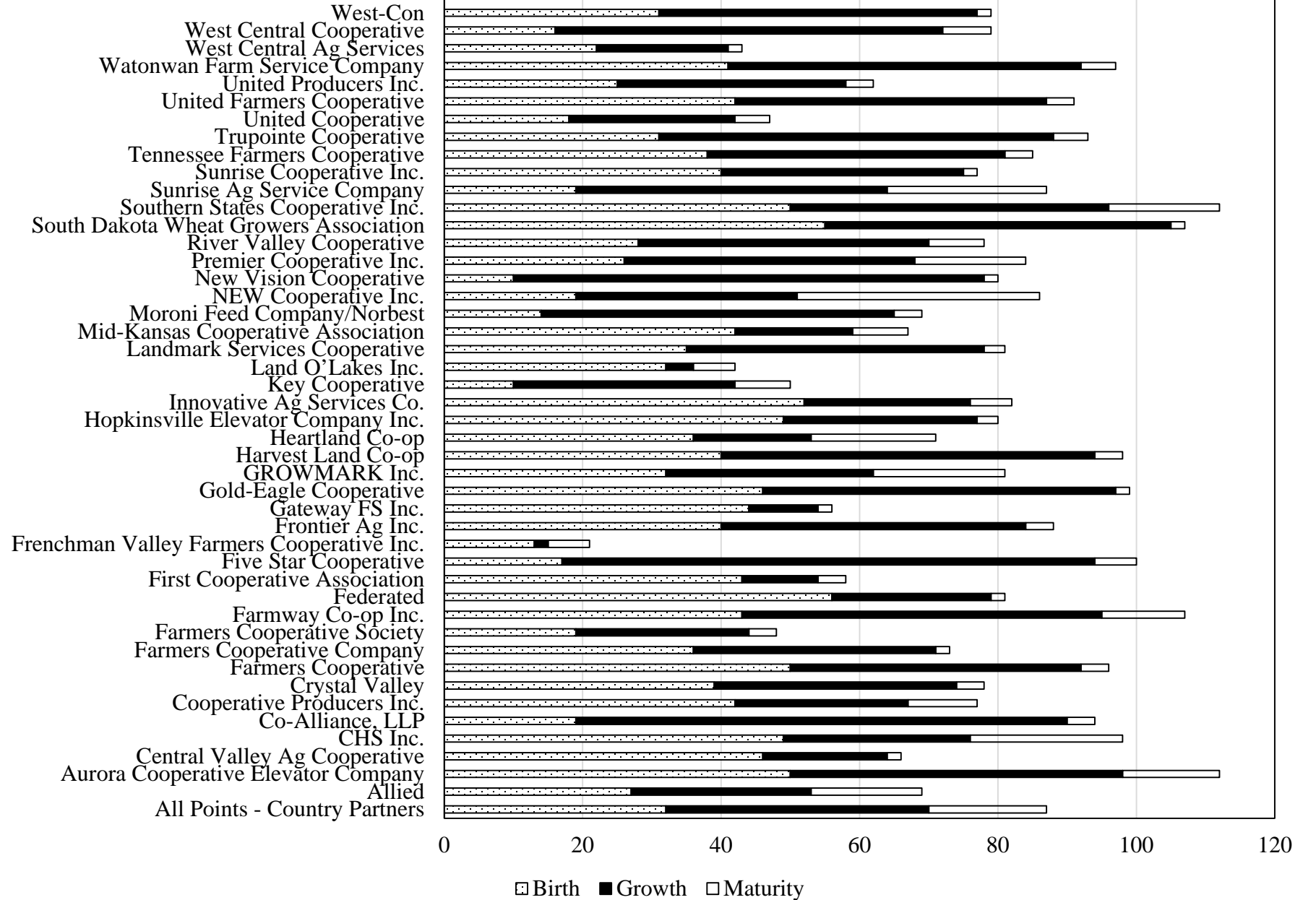
- Its organizational design date is 1931, the year of its formation under one of its original cooperatives, Cenex. However, its birth was chosen as 1921. In that year, Cottonwood Co-op Oil was created which was the world's first energy cooperative. Between 1921 and 1931, other energy cooperatives were formed and by 1931, they organized into Cenex which was a wholesale energy cooperative based in Minnesota whose patron, equity-holder, and voting members were other cooperatives like Cottonwood Co-op Oil. The duration of its birth phase was calculated as the difference between 1921 (birth year) and 1954 (first year of equity redemption) or 33 years.
- During its growth and maturity phases, it expanded operations to other states outside Minnesota; vertically integrated through ownership in two refiners, pipelines, oil lubricant manufacturing and oil wells; other farm store products such as tires, batteries, and accessories; and expanded into other farm inputs such as crop nutrients, chemicals, and agronomy products. In 1977, Cenex consolidated the farm supply business in the Pacific Northwest through an agreement with Pacific Supply Cooperatives, which expanded its geographic scope considerably. This was chosen as the end of its growth phase and its duration was the difference between 1977 and 1954 or 23 years.
- During the 1988 to 1998 time period, Cenex initiated at least four different merger discussions culminating in 1998 with a merger with Harvest States Cooperatives which ultimately became CHS. That merger was considered significant because it moved CHS into marketing of farm products and not just supplying inputs; allowed farmers to be direct members as opposed to only cooperative-members; and moved from a Midwestern, Great Plains, and Pacific Northwest Cooperative to a U.S. cooperative by 2005 and then with significant assets overseas shortly thereafter. Thus, 1998 represents the end of the maturity phase and beginning of the revitalization phase. The duration of the maturity phase is calculated as the difference between 1998 and 1977 or 21 years.



# Duration phases as measured in years for marketing cooperatives



# Duration phases as measured in years for mixed cooperatives



# Duration Phase Discussion

- The average length of duration between the marketing and mixed cooperatives was significantly longer ( $P < 0.001$  for an equality of means test) for the birth phases and maturity phases but not the growth phases.
- The duration, measured in years, of the 42 marketing cooperatives had an average birth phase of 34.11 years (standard deviation of 12.70 years); a growth phase of 37.02 years (16.86 years); and a maturity phase of 7.49 years (6.57 years).
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- All of the mixed cooperatives were formed prior to 1970 with 42 beginning their birth year by the year 1940, which was much different than that of the marketing cooperatives for whom only 50 percent had begun their birth phase by the year 1940.

# Growth and Maturity Phases

- The onset of the growth phase found 27 (58 percent relative to 48 percent for marketing cooperatives) mixed cooperatives beginning this phase by the year 1960.
- Forty mixed cooperatives (86 percent relative to 42 percent for marketing cooperatives) had completed the growth phase by the year 2000.
- Only six mixed cooperatives (13 percent relative to 45 percent for marketing cooperatives) were found to still be in a maturity phase by the year 2014.
- More strikingly, 35 (76 percent) of the mixed cooperatives had begun a new life cycle since the year 2000 based on my criteria.



# Why the differences between marketing and mixed cooperatives?

- A key year for the completion of the growth phase was 1963 because the year previously, the tax courts had ruled that U.S. cooperatives should redeem allocated equity, which had been an uneven practice before that date.
- Many marketing cooperatives in the dairy and sugar beet industries remained in maturity phases for decades due to certain elements of U.S. farm policy and the nature of these products such as bulkiness and perishability, which lead to natural oligopolistic type structures.
- Many of the marketing cooperatives are in single agricultural commodities. They have strong market share and pattern of marketing behavior over time.

# Why the differences between marketing and mixed cooperatives?

- There have been significant changes in many of the annual and perennial crops due to greater productivity as a result of drip irrigation techniques, mechanization of harvesting equipment, increased knowledge of growing techniques, and other production factors.
- The biggest changes are noted for the mixed cooperatives, which have seen dramatic changes in the last two decades. Risch et al. (2014) note that these mixed cooperatives are undergoing significant changes brought upon by increases in crop yields as noted in corn by Beddow and Pardey (2015).
- Bechdol, Gray, and Gloy (2010) note that the average planting and harvesting times have almost halved in the last decade meaning that these shorter time periods have placed a strain on logistics and asset investment has increased significantly.

# Why the differences between marketing and mixed cooperatives?

- A key factor appears to be the increase in global trade and value chains over the past twenty years for annual and perennial crops as most marketing cooperatives are marketing perennial crops (Boland, 2018).
- It is highly likely that the 1996 U.S. Farm Bill coupled with the formation and U.S. acceptance into the World Trade Organization and resulting free trade agreements have been an impetus for crop enterprise choices for annual crops that have affected mixed cooperatives and export opportunities for marketing cooperatives with perennial crops who took advantage of export enhancement programs.
- The results are striking in that since 2014, seven of the 46 mixed cooperatives have undergone mergers, which have resulted in new life cycles.
- Clearly, the overwhelming majority of U.S. mixed cooperatives have undergone rapid life cycles in USDA top 100 since 2000 and half of the marketing cooperatives have done so.

# What does it mean to me?

- Issue of what happens at end of Maturity and beginning of Decline clearly differs between Marketing and Mixed Cooperatives.
  - Few mixed cooperatives have entered Decline but revitalized themselves with some small changes in governance documents (mostly updating of bylaws and clarifying who a member (that is, who a farmer or producer is) and what happens to residual rights if it were to dissolve)
  - Importance to understand external, outside, and industry effects (farm policy changes, technology, etc.) vs internal, inside, and firm effects (strategy, slack, etc.) when thinking about his issue.
  - Next few slides have examples of marketing cooperatives who went into Decline phase and Tinker, Reinvent, Spawn or Exit (Cook and Burress, 2009)

# Some (but not many) cooperatives have changed ownership and control rights over time

- Cooperatives that have demutualized or converted to publicly held corporations include:
  - Goldkist (Atlanta, GA), Calavo Growers (Santa Ana CA), Diamond Walnut Growers (Stockton CA), FC Stone (Kansas City MO), Saskatchewan Wheat Pool (Calgary AB)
- Other cooperatives have converted to closely held companies. These include:
  - South Dakota Soybean Processors (Volga SD), Tall Corn Ethanol Cooperative (Coon Rapids IA), Dakota Ethanol (Wentworth SD), Illinois River Energy (Rochelle IL), US Premium Beef (Kansas City MO), Golden Oval Eggs (Renville MN), Dakota Growers Pasta Company (Carrington ND), Birds Eye Foods now owned by Pinnacle Foods (Rochester NY)
- Some cooperatives have been acquired or merged with investor-oriented firms.
  - Dakota Growers Pasta Company by Viterra (Carrington ND), FC Stone by International Assets Holdings Company (Kansas City MO), Minnesota Corn Processors by ADM (Marshall MN), Cal West Seeds (Woodland CA), Snokist (Yakima WA)

# Some (but not many) cooperatives have changed ownership and control rights over time

- Other have considered changing their cooperative status.
  - Ocean Spray Cranberries (Lakeville MA)
- Cooperatives that have entered bankruptcy and liquidated their assets include:
  - Rice Growers Association (Woodland CA), Tri-Valley Growers (San Ramon CA), Farmland Industries (Kansas City, MO), Agway (Syracuse NY), Humboldt Creamery (Fortuna CA), Snokist (Yakima WA)
- Cooperatives that have ended relations with other cooperatives
  - Sun Diamond Growers of California (Stockton CA), Land O'Lakes and Cenex Ag Services (Minneapolis MN)
- Cooperatives that have tried various methods to raise permanent equity capital
  - Country Lake Foods (Land O'Lakes), Harvest States equity certificates, CHS preferred stock, CoBank, Land O'Lakes preferred stock

# Things to Consider

- With some co-ops 'jumping' the USDA list because of mergers, etc., am I missing something with firms who may have dropped out in 2013 or several years before?
- Building a database beyond these top 100; have another 27 firms with similar data.