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A Measure of Duration in a Life Cycle Analysis of U.S. Agricultural Cooperatives

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A Measure of Duration in a Life Cycle Analysis of U.S. Agricultural Cooperatives

The issue of a life cycle has been discussed in the literature but no formal analysis has been shown regarding its duration in agricultural cooperatives, which are a key organizational structure in the United States. The objective is to provide evidence for a life cycle in U.S. agricultural cooperatives and measure the duration of the first three phases. A life cycle analysis is used to categorize historical data on 88 of the top 100 agricultural cooperatives comprising 71% of sales in 2014. The data suggests that marketing cooperatives have a much different life cycle relative to mixed cooperatives who have undergone significant changes since the year 2000.

JEL Codes: D79, L66, Q13

Key Words: agribusiness, agricultural cooperatives, agricultural economics, institutional economics, life cycle

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

Agricultural cooperatives are a form of a closely-held organization which is common in the food economy as noted by Fulton (1995), Hendrickse and Bijman (2002), and Karantininis and Nilsson (2007). King et al. (2010) report that agricultural cooperatives have been widely studied by agribusiness economists. The use of agricultural producers to use collective action to form purchasing cooperatives, bargaining cooperatives or marketing orders is well known (Sexton 1986a, 1986b). In general, organizational or firm life cycle models suggest firms such as cooperatives go through a process of change over time. The literature does not suggest that firms have a deterministic life cycle as analytical studies tend to be backwards looking and built around case studies and industry analyses. 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; Cook 2019). While the issue of a life cycle has been raised in the literature, no formal analysis has been shown whether it exists or the length of its duration in U.S. agricultural cooperatives. 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.

Background Information

Faculty at the Harvard Business School were the early thought leaders in articulating the concept of an organizational life cycle. The concept was first described by Penrose (1952) within the context of biology or evolution. Haire (1959) followed with a book chapter describing organizations within the context of an evolutionary system whereby organizations grew and then underwent change. This was the first formal description of a life cycle. Over time, this has

developed into a broad stream of literature, which finds that there is a consistent pattern of development in organizations in many different industries (Quinn and Cameron, 1983; Miller and Friesen, 1984). The basic concept is that organizations proceed through a series of phases before they are forced to reinvent themselves, exit, or somehow change what they are doing (Kimberly and Miles, 1980). The four classic phases are often called birth, growth, maturity, and decline. Many of these studies are linked with corporate strategic orientation (Chandler, 1962), organizational effectiveness (Hanks et al., 1993), management priorities (Miller and Friesen, 1984), or organizational behavior (Mitzenberg, 1984). More recently, a number of studies have looked at executive compensation and life cycle analysis (DeAngelo, DeAngelo, and Stulz; 2006, 2010).

Economic theory suggests that a firm builds an asset such as a manufacturing plant and optimally uses inputs in a production process. Over time, the prices of inputs change or a change in technology occurs such that the plant is not as profitable as before and its average costs begin to increase. If the firm does not change its technology because of inelastic demand, asset fixity may arise which is characteristic of many U.S. agricultural cooperatives (Williamson, 2002; Williamson, 2005). Thus, life cycle theory suggests multiple phases of change as firms enter, live, restructure, or exit an industry.

The industrial organization literature has studied the issue of firm life cycles through analysis of patterns of entry and exit as described by Caves (1998). Risch, Boland, and Crespi (2014) note that three methods have been used in the empirical industrial organization literature on entry and exit: 1) case studies, 2) descriptive analysis of entry and exit using longitudinal firm and plant specific data and 3) econometric methods using longitudinal firm and plant specific data. The management literature contains firm life cycle studies within the context of industry

studies on the rise and decline of organizations. A great deal of research has focused on the number of stages in an organizational life cycle. 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. This was followed by Miller and Friesen (1984) who looked at life cycles in 36 firms. 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. The literature has found that these phases are sequential in nature, occur as a hierarchical progression, and become increasingly complex over time. Agarwal and Gort (1996, 2002) note that industry variables are needed to account for the changes in hazard rates over time in an industry when doing econometric analysis of life cycles. A classic four phase life cycle includes birth, growth, maturity, and decline.

Elements of Firm Life Cycle for Cooperatives: What Does the Literature Say?

Cook (1995) suggests that the economic health of a cooperative varies over time where economic refers to accounting ratios such as Return on Equity or Net Profit Margin. Other reasons include member satisfaction with the price received for their commodities marketed through the cooperative or prices paid for inputs purchased through the cooperative or satisfaction with the strategy that the cooperative is pursuing in its alignment on the vertical extension of its members' farming operation (Grossman and Hart, 1986). This relationship between economic health and time is commonly used in life cycle analyses.

Birth Phase of a Cooperative Firm

Economic motives that lead to cooperation between farmers are well defined (Sexton and Sexton, 1987). Origin or birth stories find that cooperatives emerge in an industry due to market failure and producers collectively organize for mutual benefit to reduce their costs of contracting to obtain volume premiums for marketing commodities and volume discounts for farm inputs and used defensive strategies (Cook, 1995). The early efforts are documented in many cooperative histories such as Land O'Lakes (Ruble, 1947). Most recently, Frenken (2013) shows how Dutch dairy cooperatives emerged because of their ability to reduce the transactions costs with their members who supplied milk to the factories and how this advantage has continued over time.

Many U.S. agricultural cooperatives began as social movements and their corporate governance documents such as articles of incorporation and bylaws reflect this as noted by Keillor (2000). Grabowski (2013) describes why agricultural sectors globally saw such formation. He uses governing coalitions which is another way to think about cooperative formation. Some financial service cooperatives still maintain social aspects within their structure as discussed by White and Boland (2016). In the birth phase, the economic purpose of the cooperative embedded the principles of cooperation. These included economic principles such as user-ownership, user-control, and user-benefit but also incorporated social principles such as duty to educate and cooperation among cooperatives. The organizational architecture reflects this dual purpose of the cooperative. Chaddad and Cook (2004a) note that cooperative economic principles impact residual claim and residual control distribution rights through proportional patronage features, limited return on risk capital constraints, equity capital acquisition policies, monitoring mechanisms and representation rules.

Growth Phase of a Cooperative Firm

During the birth phase of a cooperative, the firm requires capital to finance the assets needed by its members. This is often done through reinvestment of patronage earnings as allocated equity. However, at some point, the cooperative does not require as much capital and it may redeem that "excess" equity back to its members. This point inaugurates the growth point of the cooperative as it is able to generate income from the existing assets it has invested in for its member's use. The literature suggests that the growth phase in an asset intensive industry may be long. In the United States, it was common for purchasing cooperatives (that is, hardware, farm supply, etc.) to cooperate and create federated cooperative structures to acquire assets such as oil refineries, fertilizer mines, nitrogen fertilizer plants, and related distribution networks for such products. These assets have long lasting time horizons. At some point in time growth begins to slow down and the maturity phase of the life cycle begins.

Maturity Phase of a Cooperative Firm

The literature suggests that mergers within an industry that consolidate market shares, reduce excess capacity, and lower average costs of production are cited as evidence that a firm has entered into a mature phase of its life cycle. Cooperative member expectations may change during this process. Over time, individual members of a successful cooperative may experience a divergence of interests. This heterogeneity in preferences may threaten the viability of the cooperative organization as competing member-patron interests have the potential to increase collective decision-making costs (Hansmann, 1996). A cooperative possessing sufficient financial slack has an opportunity to attempt to appease multiple distributional coalitions in the short run. Research suggests that, historically, many cooperatives have minimized the use of

long-term debt relative to their investor-oriented counterparts, which leads to financial slack on the balance sheet. In the long run, this strategy can result in specific costs such as free-rider, horizon, portfolio, free cash flow, influence, and control that erode the competitive advantage of the organization (Fama and Jensen, 1983; Jensen, 1986; Cook, 1995).

Internal factors that increase heterogeneity over time may also exist such as inability to meet member expectations on revolvement of patron equities on the balance sheet. Divergent interests expand among the members as the cooperative grows through multiple locations and expands the number of members and geography served. Furthermore, difficulty in communicating a cooperative's mission after the issue of market failure has been addressed and members can substitute goods and services produced by competitors can occur. Finally, growth or expansion in different lines of business impact the economic interests of patrons differently (Helmberger, 1966; Iliopoulos and Hendrikse, 2008). Members who cease transacting with the cooperative due to retirement may continue to possess allocated equity and voting rights in the cooperative. This contributes to the potential for a larger number of member-owners. Consequently, a decision is made that affects organizational survival, which suggests that the firm is entering its decline (or revitalization leading to a new life cycle) phase and decision about how to proceed.

Decline Phase of a Cooperative Firm

If the full range of options is available, Cook (2018) argues that the member will choose from the following: tinker, reinvent, spawn or exit. Tinkering redesigns constitutional or operational mechanisms to align preferences and incentives of the membership or a membership subset. In effect, this strategy necessitates diagnosis to align selective incentives. Choosing the "tinkering"

option suggests no significant change in ownership rights. It often entails a change in bylaws, operating practices or policy that reduces friction. This may also mean a merger, which would lead to a new life cycle. This is the most common form of cooperatives response to the decline phase.

The reinvention choice means ownership rights of the member-patron change. However, most cases of reinvention redistribute claimant and control rights among member-patrons. Examples of successful hybrids, which assign ownership rights to patrons and non-patrons remain relatively rare on the cooperative landscape. More common are cases of reinvention altering redeemability of shares or reassigning claimant rights to investors rather than patrons. Much of the literature investigating new forms of cooperatives describe this alternative strategy including Nilsson (2001), Brester and Boland (2004), Chaddad and Cook (2004a), Menard (2005), and Chaddad and Iliopoulos (2013).

Gompers, Lerner and Scharfstein (2005) introduced the word spawning to describe a process where individuals formerly affiliated with a 'parent' cooperative organize a separate entrepreneurial venture. These ventures are often interlocking in nature and utilize joint investor networks cultivated as a result of interaction within the parent organization. Exit means member patrons change the ownership rights of the entity so that ownership rights are no longer based on patronage. This might mean conversion to an investor-driven rather than patron-driven firm, conversion to a hybrid where the member patrons lose majority residual control rights, entrepreneurial harvesting, or total liquidation. Appendix A describes four types of activities used by cooperatives in this decline phase who chose not to proceed into a new life cycle.

Description of the 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. Because of confidentiality reasons, the USDA cannot disclose the names or addresses of these cooperatives. However, it does list the top 100 cooperatives that have the majority of cooperative memberships, sales, and assets.

Five were solely farm input purchasing cooperatives. Forty-four were marketing cooperatives operating in the corn-ethanol, sugar beet, citrus, fluid milk and related products, tree nuts, dried fruit, stone fruit, tree fruit, rice, cranberries, grapes, cherries, blueberries, and vegetable industries. Fifty-one were mixed cooperatives that sold members crop nutrients, chemicals, animal nutrition, energy, operating capital, seed, agronomic and energy services, and other inputs and marketed member food grains, feed grains, and oilseeds. These mixed cooperatives sell inputs to members and buy their outputs. Virtually all of these 100 cooperatives are surviving entities in the sense that they have seen business enterprise changes, expansion in geographic markets, legal entity name changes, and acquisitions or mergers over time. We were not able to find the necessary information on eight of the top 100 agricultural cooperatives based on sales in 2014 and thus, 92 are used in this study. Since there are only four purchasing cooperatives with data, these are also dropped to leave a final total of 88 agricultural cooperatives (42 marketing and 46 mixed). Appendix B summarizes the type and source of data for each of the cooperatives in our study.

Approach

The history of these 88 cooperatives are extensively studied to determine significant moments in their history when the firms underwent a sequential change moving through the four classic life cycle phases. Because the cooperatives in this study are survivors, we do not consider the decline phase in measuring duration. The cooperatives in this data would have undertaken some strategy to revitalize themselves rather than exit or evolve into a non-cooperative form of business. In cases where a cooperative went through a merger, we use the data for the predecessor cooperative that had the highest value of assets and sales volume. Figure 1 presents the four phase firm life cycle used in this study and shows the calculation for the duration of the time period for the birth, growth, and maturity phases.

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. This is chosen because it represented a point in time when the cooperative would have begun growing but did not need the "excess" equity for growth, which suggests sufficient profitability was occurring to finance future growth. 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.[2] Every cooperative in our study had undergone more than one merger but not all were significant. The end of the maturity phase was defined as the time when significant changes

[2] We chose 25 percent somewhat arbitrarily but similar cutoffs at 10% and 40% do not change our results.

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.

An Example Calculation of the Duration of Phases

For example, CHS is the world's largest cooperative based on sales. 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. We did not consider Harvest States Cooperatives because it was a predecessor cooperative of smaller size with regard to assets and sales. A similar process was used for the 87 other cooperatives.

Results

Figure 2 shows the duration in years of the 42 marketing cooperatives with an average birth phase of 18.81 years (standard deviation of 10.86 years); a growth phase of 32.52 years (23.41 years); and a maturity phase of 12.02 years (10.86 years). Eight marketing cooperatives were determined to have gone through at least one life cycle. The onset of the growth phase was prior to the year 1960 for 20 cooperatives with half of those beginning this phase in the decades of the 1950s. The completion of the growth phase was first determined in the year 1968 for one cooperative with an additional 17 completing this phase by the year 2000 and 24 after the year 2000. Eight marketing cooperatives had completed the maturity phase by the year 2000 and begun a new life cycle after that year, while ten more cooperatives had completed the maturity phase by 2010 and begun a new life cycle. Nineteen cooperatives were found to be in the

maturity phase. Thus, the average maturity phase of 12.02 years understates the actual years because it ignores what might happen in the future.

Figure 3 shows the duration in years of the 46 mixed cooperatives. 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). All of these 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. 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.

Discussion

Several items are evident with regard to these findings. 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. The corporate documents that were examined bear this out. It is not surprising to see the

results for that decade. 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. There have been significant changes in many of these 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.

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 since 2000 and half of the marketing cooperatives have done so.

Implications

A detailed analysis of 88 U.S. agricultural cooperatives that comprise the majority of assets and sales shows evidence of a firm life cycle. The data were disaggregated into marketing and mixed cooperatives. There is clearly a difference in the duration between the marketing and mixed cooperatives with the latter undergoing significant change since 2000 and many leaving one life cycle and beginning a new life cycle. Reasons for this change for mixed cooperatives appear to be linked with the increase in crop yields, especially that of corn, which requires greater amounts of crop nutrients, and soybeans. The storage and agronomic services needed to handle such crops in the United States have required new investment. Perennial crops owned by members of marketing cooperatives have also undergone change with new production systems, which could include mechanical harvesting, advanced irrigation techniques, and pruning practices which have increased yields. In addition, an increase in the acreage of land per farm it stands to reason that with farm consolidation there has been a consolidation in the cooperatives owned by farmers.

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Appendix A Summary of Activities undertaken by Cooperatives in Decline Phase

Eversull (2014) summarizes restructuring efforts of U.S. agricultural cooperatives for 2000 to 2013 updating an earlier study from 1988 to 2000. During the 2000 to 2013 time period the number of U.S. agricultural cooperatives declined from 3,346 to 2,106 and 1,181 cooperatives restructured. The most common form of restructuring was cooperatives merging with each other in 46% of the restructurings. The second most common form (42%) was bankruptcy and we identified cooperatives such as Rice Growers Association (Bond, Carter, and Sexton, 2009), Tri-Valley Growers (Hariyoga and Sexton, 2009), Farmland Industries, Agway, Humboldt Creamery, and Snokist in this category. Conversion to a different form of closely-held company was the third most common form (7%) and we identified examples including South Dakota Soybean Processors (Barton and Boland, 2007), Tall Corn Ethanol Cooperative, Dakota Ethanol, Illinois River Energy, US Premium Beef (Katz and Boland, 2000), Golden Oval Eggs, Dakota Growers Pasta Company (Boland and McKee, 2009), and Birds Eye Foods (Amanor-Boadu et al., 2003). The fourth most common change (4%) was acquisition by another public firm with examples including Minnesota Corn Processors and Cal West Seeds (Gigstad, Boland and Brester, 2009). Finally, the most rare form (1%) was demutualization or conversion to a public firm with examples including Diamond Walnut (Hardesty, 2009), California Avocado Cooperative (Stanford and Hogelund, 2004), FCStone (Barton, 2009), and Goldkist.

Appendix B Sources of Information for the Agricultural Cooperatives in this Study[a]

Cooperative	Corporate Reports	Published Histories	Digital Content	Other Written Information	Personal Interviews
Ag Processing Inc.	x				x
Agriland FS Inc.	x		x		x
Agri-Mark Inc.					x
Alabama Farmers Cooperative Inc.			x		x
All Points - Country Partners	x		x		x
Allied	x		x		x
American Crystal Sugar Company	x			x	x
Associated Milk Producers Inc.	x		x	x	x
Aurora Cooperative Elevator Company	x		x		x
Blue Diamond Growers		x	x	x	x
Bongards Creameries	x		x		x
California Dairies Inc.					x
Central Valley Ag Cooperative	x				x
CHS Inc.	x	x	x	x	x
Citrus World Inc. (Florida's Natural Growers)				x	
Co-Alliance, LLP	x		x		x
Cooperative Producers Inc.	x		x		x
Cooperative Regions of Organic Producer Pools (CROPP)			x		x
Crystal Valley	x		x		x
Dairy Farmers of America		x	x	x	x
Equity Cooperative Livestock Sales Association			x		x
Farmers Cooperative	x		x		x
Farmers Cooperative Company	x		x		x
Farmers Cooperative Society	x		x		x
Farmers Grain Terminal Inc.	x		x		x
Farmway Co-op Inc.	x		x		x
Federated	x		x		x
First Cooperative Association	x		x		x
First District Association	x		x		x
Five Star Cooperative	x		x		x
Foremost Farms USA, Cooperative	x	x	x		x
Frenchman Valley Farmers Cooperative Inc.	x		x		x
Frontier Ag Inc.	x		x		x
Gateway FS Inc.	x		x		x
Gold-Eagle Cooperative	x		x		x
GROWMARK Inc.	x		x		x
Harvest Land Co-op	x		x		x
Heartland Co-op	x		x		x
Heritage Cooperative Inc.	x		x		x
Hopkinsville Elevator Company Inc.	x		x		x
Innovative Ag Services Co.	x		x		x
Key Cooperative	x		x		x
Land O'Lakes Inc.	x	x	x	x	x
Landmark Services Cooperative	x		x		x
Lone Star Milk Producers Inc.			x		x
Maryland & Virginia Milk Producers Co-op Association			x		x
Michigan Milk Producers Association			x		x

Michigan Sugar Company	x		x	x	x
Mid-Kansas Cooperative Association	x		x		x
Moroni Feed Company/Norbest	x	x	x		x
NEW Cooperative Inc.	x				x
New Vision Cooperative	x		x		x
NFO Inc.			x		x
Northwest Dairy Association	x				x
Ocean Spray Cranberries Inc.			x	x	
Pacific Coast Producers	x		x	x	x
Plains Cotton Cooperative Association			x		x
Prairie Farms Dairy Inc.	x		x		
Premier Cooperative Inc.	x		x		x
Producers Rice Mill Inc.			x		x
Ray-Carroll County Grain Growers Inc.	x		x		x
Riceland Foods Inc.					x
River Valley Cooperative	x		x		x
Saint Albans Cooperative Creamery Inc.	x		x		x
Select Milk Producers			x		x
Snake River Sugar Company	x		x		x
South Dakota Wheat Growers Association	x	x	x	x	x
Southern Minnesota Beet Sugar Cooperative	x		x		x
Southern States Cooperative Inc.	x		x		x
Staple Cotton Cooperative Association			x		x
Sunkist Growers Inc.	x	x	x	x	x
Sun-Maid Growers of California	x	x	x	x	x
Sunrise Ag Service Company	x		x		x
Sunrise Cooperative Inc.	x		x		x
Swiss Valley	x		x		x
Tennessee Farmers Cooperative	x		x		x
Tillamook County Creamery Assoc.	x	x	x	x	x
Tree Top Inc	x		x	x	x
Trupointe Cooperative	x		x	x	x
United Cooperative	x		x		x
United Dairymen of Arizona			x		x
United Farmers Cooperative	x		x		x
United Producers Inc.	x		x		
Upstate Niagara Cooperative Inc.	x		x	x	x
Watonwan Farm Service Company	x		x		x
Welch Foods	x	x	x	x	x
West Central Ag Services	x		x		x
West Central Cooperative	x		x		x
West-Con	x		x		x

[a] Corporate reports include articles of incorporation, bylaws, board meeting minutes, audits, and similar type information. 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.

Figure 1. Agricultural Cooperative Firm Life Cycle Phases and Measurement of their Duration

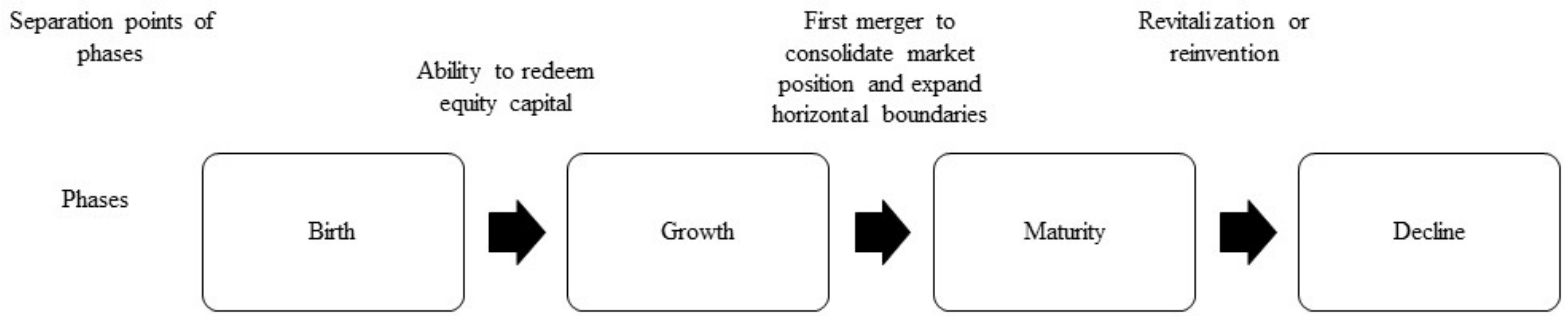

Figure 2. Length of Duration for Birth, Growth, and Maturity Phases in 46 U.S. Agricultural Marketing Cooperatives

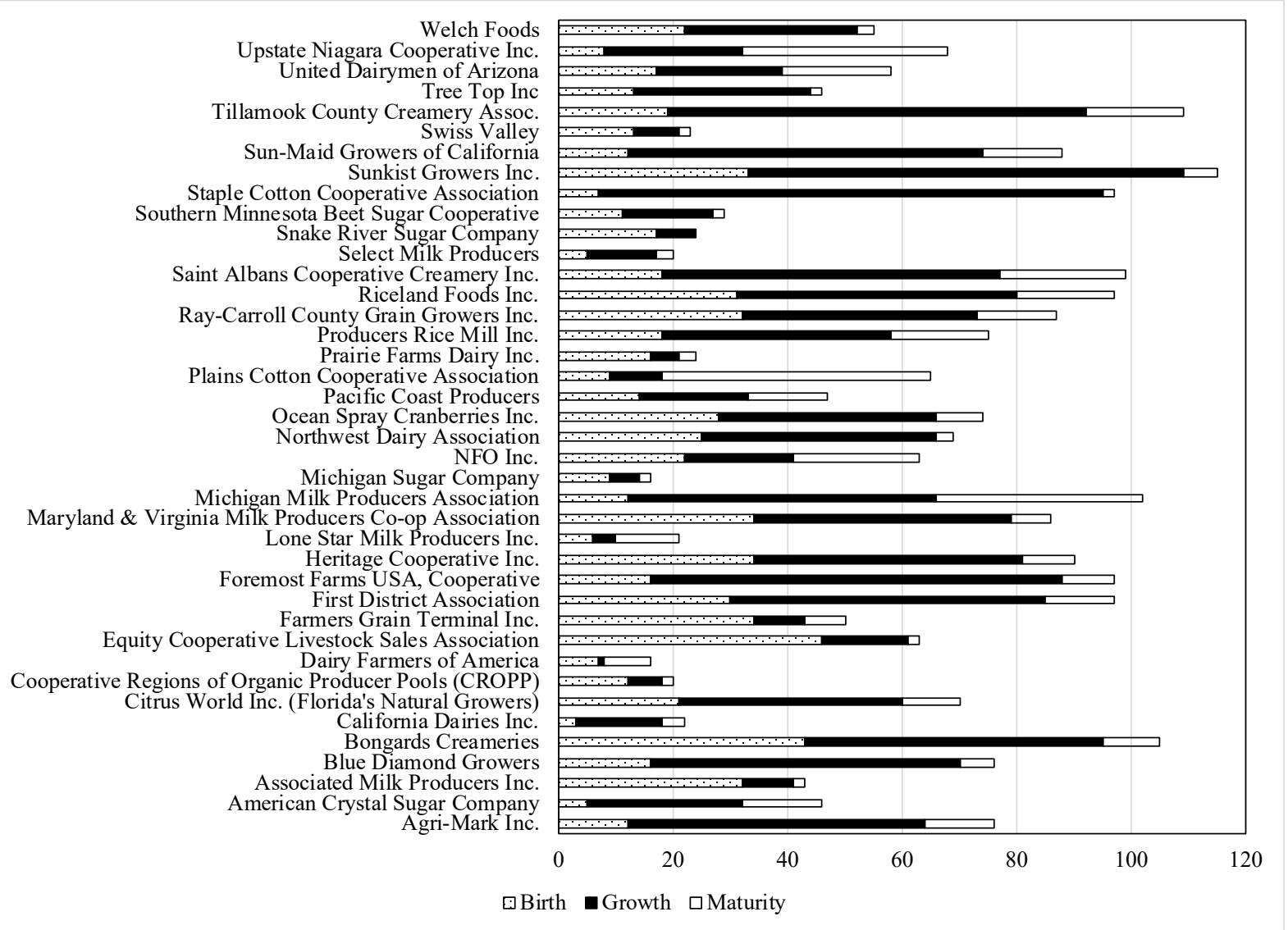

Figure 3. Length of Duration for Birth, Growth, and Maturity Phases in 42 U.S. Agricultural Mixed Cooperatives