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Ratios and benchmarks as tools for local food hub decision-making: a comparative case study

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**Ratios and benchmarks as tools for local food hub decision-making:
A comparative case study**

by

Savanna Lyons

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Economics and Sustainable Agriculture

Program of Study Committee:
Georganne Artz, Major Professor
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Iowa State University

Ames, Iowa

2016

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boxes into trucks, wake up in the middle of the night thinking about logistics, and spend their personal savings on pallet jacks. They juggle financial stress, strong personalities, and occasional public criticism, yet remain kind and hopeful. Their passion has been a great inspiration.

ABSTRACT

Food hubs, or local food aggregation and distribution businesses, are triple-bottom-line firms that play an increasingly important role in connecting small and mid-sized farmers to wholesale and retail markets. This paper explores how food hubs can use their financial data to identify and address strengths and challenges in their operations. We propose a “dashboard” of key metrics and benchmarks for food hub managers, and apply it a comparative case study of four food hubs over three years of operations. We compare and contrast the liquidity, cash flow, efficiency, solvency and repayment capacity of the four cases, and analyze cross-cutting themes.

We find that although the food hubs varied in their business structure and composition of sales outlets, they all faced the challenges of limited working capital, labor inefficiencies, high debt-asset ratios, and limited profitability. Some firms were able to break even below the \$1 million sales level typically cited as a food hub breakeven point, but still struggled to maintain positive profits, suggesting that they remained in a “breakeven” phase even as they grew. All of the food hubs owned relatively few fixed assets and used relatively little term debt from outside sources. Modest net worth and small total asset size left each firm vulnerable to insolvency in years of negative profit. However, with bootstrapping techniques such as renting or sharing equipment and collecting payments quickly, in general they used their assets efficiently.

We evaluate the usefulness of our metrics and benchmarks in analyzing food hubs, and offer suggestions on how recordkeeping could be improved to make financial analysis easier. Finally, we return to the literature to make recommendations for managers on resolving challenges seen in the metrics, including problems with cash flow, solvency, labor efficiency and turnover, inventory management, and pricing.

CHAPTER 1

INTRODUCTION

1.1 Background & Problem to be Addressed

Over 260 food hubs, or local food aggregation and distribution businesses, have been documented in the U.S (USDA Agricultural Marketing Service, 2014). According to the USDA, “a regional food hub is a business or organization that actively manages the aggregation, distribution and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand.” These values-based businesses provide important services for small and mid-sized farmers by marketing local products to new consumer bases, brokering volume sales, coordinating distribution logistics, and helping producers meet industry requirements in areas such as food safety and packaging (Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly, 2012). However, given the narrow margins and the economies of scale that are typical of the food wholesale and distribution industries, food hubs often struggle with the long-term financial viability of their operations. Key challenges include accessing capital, managing cash flow and working capital, using labor and other resources efficiently, and obtaining sufficient prices to sustain and grow the business (Barham et al. 2012; Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013).

Within the past five years, much progress has been made in providing business assessment guidance to food hubs and to the community of their potential funders and lenders. The national Food Hub Benchmarking Study, conducted through a collaboration of Farm Credit, Morse Marketing Connections and the Wallace Center at Winrock International, represented the first national effort at establishing financial benchmarks for the local food aggregation and distribution sectors (NGFN Food Hub Collaboration, 2015). The 2014 study offers a list of

appropriate benchmarking measures, calculates average and “top 25%” figures based on data from nearly 50 hubs nationwide, and provides some suggestions for how hubs can utilize the benchmarks. These data and the accompanying webinars provide a blueprint for hubs to compare their financial measures to those of their peers. Additionally, Wholesome Wave’s Food Hub Business Assessment Toolkit, revised in 2014, offers a qualitative but carefully structured framework for evaluating food hubs’ readiness for investment (Vanderburgh-Wertz & Ram Moraghan, 2014). This toolkit focuses on aspects such as strength of the business model, social and environmental impact potential, positioning within the market, and more.

Even with such resources at hand, many hub managers still struggle at evaluating their own businesses. Food hub outreach efforts by the Leopold Center for Sustainable Agriculture and Iowa State University Extension and Outreach have suggested that managers still harbor uncertainty regarding how to interpret their financial measures, which measures to focus upon and, most importantly, how to utilize those measures in making decisions. The benchmarks in the Food Hub Benchmarking Study were drawn from entities that have a very wide range of business models and vary in scale. We have observed food hub managers trying to place their own data into the context of these benchmarks, but some have expressed confusion about how the numbers usefully apply to them. There appears to be a need for further guidance to help food hub managers interpret their own data in the context of the benchmarks that are available.

Food hub managers often come from the nonprofit sector or lack a formal background in the business of food marketing beyond the farm level. For example, the National Food Hub Survey in 2013 showed that 36% of food hub managers had 2 years or less of experience in warehousing and distribution of food and 41% had 2 years or less of experience in food retail

(Fischer et al. 2013). Many managers have expressed a need for training in financial analysis and in how to structure recordkeeping so that it leads towards analysis.

In informal interviews with ten food hubs prior to the beginning of our formal study, we asked food hub managers from across the country what training or technical assistance they needed, and what information they wished they'd known when they launched their business. The following are examples of their questions:

“Which benchmarks should we be the most concerned with? Are we focusing too much on sales and not enough on profits?”

“How do large conventional wholesalers manage their finances and keep records?”

“What are typical Costs of Goods Sold and prices paid to farmers?”

“What are typical gross margins – overall and for different product types?”

“How do we decide whether to charge a larger gross margin for certain products?”

“Should gross margins be higher or lower for frozen items?”

“How do we know what staff salaries and laborer wages are reasonable?”

“How should our pricing reflect the type and distance of delivery that we offer?”

To address such questions, the present study was completed to explore how food hubs can use their own financial data to evaluate their businesses and to make better managerial decisions. To our knowledge, no comparative case study has been conducted that actually explores how food hub managers could use available metrics to evaluate their operations. The present study compiles a range of tools for food hub evaluation and tests them on real cases. To the extent possible, we try to address the questions that food hub managers posed to us in our early interviews.

One advantage of doing this research specifically with food hubs, rather than referring to research on other types of supply chain intermediaries, is the opportunity to address financial management within a values-based or “triple bottom line” paradigm. First described in the 1990’s by John Elkington, the triple bottom line approach suggests evaluating businesses’ success based on three different “bottom lines:” their impacts on people, their impacts on the environment, and their monetary profit (Elkington, 1998). A variety of authors such as Willard (2002) and Savitz & Weber (2006) have documented the triple bottom line approach and the resulting benefits, both for firms’ own success and for society. The missions and values of food hubs generally emphasize all three bottom lines, as we will see later, and so we refer to them as “triple bottom line businesses.” A food hub’s commitment to such values as paying a farmer a fair price or paying workers a living wage will necessarily affect its management decisions, leading managers to look for sources of increased profitability other than reducing COGS or wages. Therefore, recommendations for management of a food hub must take into consideration the hub’s stated mission, goals and values. Our recommendations also incorporate a discussion of how to evaluate salary and wage competitiveness, which is tied to the social responsibility objectives shared by many food hubs.

As evidenced by over 400 attendees at the biannual National Food Hub Conference, there exists a national audience of food hub practitioners and supporters who are actively engaged in understanding and improving food hub business models. To reach this broader audience, some findings of our analysis have also been incorporated into a guide for food hub managers, *The Managers Guide to Food Hub Financial Metrics*, which employs both fictionalized and actual examples to illustrate how financial measures can be used to make management decisions.

1.2 Objectives

The present paper provides a comparative case study, incorporating quantitative and qualitative elements, of four food hub businesses. We calculate key measures of liquidity and cash flow, profitability, efficiency, repayment capacity and solvency for each food hub over a period of three years, compare them to industry benchmarks, and analyze them in the context of the narrative history of each food hub. To place each hub's performance within the context of the broader food system, the hubs' financial and operational measures are compared to benchmark data selected from (1) the produce wholesale and broad-line food wholesale industries, (2) the cooperative and conventional retail grocery industries and (3) the 2014 Food Hub Benchmarking Study. These data are used to determine how each food hub could have used (and could use) its own available information to make better managerial decisions about issues such as pricing, staffing structure, composition of sales outlets, billing practices and financing.

The particular objectives of the study are to explore how food hubs can use their own financial data to identify and address the strengths and challenges in their operation. Using data that most food hubs already have available in their financial records, we show how financial metrics can be used by managers to identify problems and risks and to make decisions. This research enables us to evaluate various benchmarks and indicators for food hubs, including those proposed in the Food Hub Benchmarking Study, as well as benchmarks from closely related industries. We also seek to offer a deeper understanding of common food hub challenges and, where possible, to provide solutions from the literature.

1.3 Research Questions and Propositions

Yin (2003) suggests that a case study research design should identify the study's questions, its propositions and its units of analysis. The research questions that we sought to address are as follows.

1. How can a set of financial metrics be used to evaluate the performance of a particular food hub and to direct managerial decision-making in the future?
2. To what extent are benchmarks from other types of food businesses, such as wholesale distributors and retail grocers, useful for evaluation of individual food hubs?
3. How do the financial histories of individual food hubs reflect characteristics documented in the food hub and small business literature, including:
 - Constrained working capital;
 - Limited access to capital and/or disproportionate use of internal over external financing;
 - Difficulties with labor efficiency and staff retention;
 - Difficulties with pricing and price negotiation;
 - Grant dependence; and
 - Difficulties achieving profitability, especially below annual sales of \$1 million for wholesale and "hybrid" hubs.
4. What financial characteristics and challenges seem to be shared in common among food hubs of different sizes, ages, structures, business models and geographic locations?

In this study we use literature on food hubs and from other industries to propose a common “dashboard” of key metrics as a starting place for food hub financial evaluation. We then apply the metrics in that dashboard to four detailed food hub case studies. The following propositions are explored in the studies:

- Our proposed set of key metrics and evaluation methods reveal challenges and opportunities in a way that can be used by managers to make decisions and improve food hub financial viability.
- A combination of internal and external benchmarks are needed to provide a useful evaluation of a food hub. External benchmarks (from retail, and wholesale food businesses and other food hubs) provide context for interpretation of key metrics, but internal benchmarks (comparing the firm’s current performance to its own goals and past performance) are necessary for useful evaluation.

The units of analysis in the comparative case study are the four food hub firms whom we have interviewed and whose metrics we have calculated. The cases of these four businesses offer a lens through which to understand food hub challenges in general, a chance to experiment with financial evaluation methods, and a “jumping-off” point for making recommendations that may benefit other food hub managers.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter begins with an overview of the financial state of food hubs, including measures of their economic viability, benchmarking data collected from existing hubs, and efforts to model breakeven sales levels for a “typical” food hub. We review the challenges that food hub managers report facing as they pursue viability. We then turn to a broader review of the characteristics of small and start-up enterprises, including how they access capital and how this affects their financial statements. Finally, we review how the concept of financial evaluation has already been applied to food hubs. This literature review contributes to our effort to create a financial evaluation tool for food hub managers.

2.2 The Financial State of Food Hubs

Triple bottom line businesses that aggregate and distribute local food have existed for some time, but the invention of the term “food hub” is relatively recent. Up until 2010, there was a fairly well-developed literature referring to “food value chains,” “aggregators,” and values-based supply chains,” but not much of an effort had been made to document the business models, financial characteristics and operations of local food aggregator-distributors in the United States (Lerman, Feenstra, & Visher, 2012). In 2010 the National Good Food Network (NGFN), a program of the Wallace Center at Winrock International, hosted the first of a long series of webinars explicitly addressing the topic of food hubs. The following year NGFN partnered with USDA on the first National Food Hub Survey, which received responses from 45 food hubs (Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013). In 2011, USDA’s

Agricultural Marketing Service launched a resource page for food hubs (Neal, 2011) and thereafter released several publications on food hub business models. These primarily described the characteristics of existing processors, aggregators and distributors of local food and documented their lessons learned (Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly, 2012; Matson, Sullins, & Cook, 2013; Matson, Thayer, & Shaw, 2015).

In the first of its major food hub publications, USDA defined a “regional food hub” as “a business or organization that actively manages the aggregation, distribution and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand.” (Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly, 2012, p. 4) Authors also noted that “regional food hubs are defined less by a particular business or legal structure, and more by how their functions and outcomes affect producers and the wider communities they serve.” Other defining characteristics given for regional food hubs included considering producers as valued business partners, working closely with producers to help them meet buyer requirements, using product differentiation to help farmers obtain good prices, and working towards financial viability while delivering positive economic, social, and environmental impacts for communities. In the years following 2012, there emerged a more robust literature that continued grouping businesses under the heading of “food hub” because of the similarity of their missions. USDA’s definition has been cited by many others, and is consistent with subsequent literature in identifying food hubs as values-based or triple bottom line businesses (see for example Vanderburgh-Wertz & Ram Moraghan, 2014; Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013).

As suggested by USDA’s definition, the term “food hub” has been applied to a variety of business models, from online retail farmers markets to regional wholesale distributors, and a

variety of legal structures, including nonprofits, cooperatives and for-profits. The commitment to work closely with farmers and to pay them a “fair” price has often meant sacrificing profitability, especially in wholesale markets where margins are already razor-thin (Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly, 2012). So in spite of their diverse approaches, food hubs as a group have faced common challenges that distinguish them from their conventional counterparts in food wholesale or retail. However, the tremendous variation among food hubs also makes it difficult to generalize about them or to aggregate and interpret their data. For example, gross margins for a food hub that sells directly to consumers are very different from gross margins in a food hub that sells exclusively wholesale (NGFN Food Hub Collaboration, 2015). The differences among hubs remain a challenge for the authors of all the literature we reviewed, and help explain why a combination of statistical analyses and case studies may be necessary to better understand food hubs.

Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly (2012) were among the first to explore the conditions necessary for food hubs to be economically viable. In the authors’ definition, a food hub was “viable” if “revenue generated from sales covers core operational costs of aggregating, distributing, and marketing food products.” They interviewed twenty food hubs about their viability, the challenges they were facing, and the opportunities they saw for business growth. Seventeen of the interviewees self-reported that their businesses were economically viable or were “well on their way to achieving this.” The researchers did not see a link between viability and geographic location or legal structure, but they did observe that the median age of so-called viable food hubs was 9.5 years, compared to 5 years for food hubs that said they were not yet viable. Barham et al. also observed that all of the economically viable hubs reported gross annual sales of at least \$1 million. The publication became the first of

several to identify \$1 million or \$1.5 million as the apparent breakeven sales level for food hubs, followed by Vanderberg-Wertz & Ram Moraghan (2014) and Matson & Barham in reference to wholesale hubs (2015).

The National Food Hub Survey in 2013 collected a larger data set via an online survey of 107 food hubs (Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013). The survey received responses from food hubs of a variety of business models, geographic locations and sizes. While the food hubs responding to the survey reported overall average 2012 sales of \$3,747,044 per hub, 58% of them had earned \$500,000 or less in 2012. About 51% indicated that they were not at all dependent on outside funding, while 32% said they were somewhat dependent and 17% said they were highly dependent. The researchers found no significant relationship between reported degree of reliance on outside funding and location, total sales, types of products sold, number of full-time employees, number of producers, percentages of small and midsized producers and percentage of sales from products of small and mid-sized farmers. Operating structure, however, was significantly related to reported funding dependence ($R_s = .45, p < .01$). Nonprofit food hubs were more likely than for-profits and co-ops to report that they were reliant on outside funding, with 38% of the nonprofits reporting this. 64% of co-ops and 69% of for-profits reported being not at all reliant. Certain community services, including paid employment opportunities for youth, acceptance of SNAP benefits, provision of SNAP matching funds, nutrition or cooking education and mobile markets, had what the authors deemed a “slightly significant” association with reported dependence on grant funding, at a significance level of 0.1. The study also reported that “food hubs that participated in packaging or repackaging of products were far less likely to have indicated they were highly dependent on grant funding. On the other

hand, food hubs that offered brokering services were much more likely to have indicated that they were highly dependent on grant funding.”

The authors sought to measure the financial condition of respondents in more quantitative terms by calculating a “business efficiency ratio” of total expenses divided by total revenue. For the whole population of respondents, they found an average business efficiency ratio of 1.09 (indicating that average expenses exceeded average revenues), and a median of 1.00.

Cooperatives were reportedly the most self-sufficient, with an average ratio of 0.94, while nonprofits had the highest ratio of 1.2. Consistent with the findings of Barham et al. in 2012, ratios were lower for older food hubs. Several factors in the data collection may have added confusion to these results. First, the authors point out that brokerage-model firms may have counted only brokerage fees and not total sales as part of their revenues, while firms that took ownership of product may have counted all sales as revenue. Second, when reporting the revenue that was used to calculate the business efficiency ratios, food hubs who took the survey were not asked to differentiate between business and charitable revenue. So, the ratios themselves may not be a reliable indicator of the degree to which food hubs could sustain themselves without grants. In any case, the data suggest that many respondents were having trouble covering their expenses using their own revenue.

To date, probably the most comprehensive study on food hub finances has been the Food Hub Benchmarking Study conducted by The National Good Food Network’s Food Hub Collaboration (NGFN Food Hub Collaboration, 2015). This study, whose second round of results was published in 2015, compiles financial and operational performance benchmarks based on income statements, balance sheets, statements of cash flows and survey data voluntarily submitted by food hubs. The 2015 iteration of the study utilized data from 48 U.S.-based hubs.

The participating hubs had various sizes, ages, and sales channels, which the authors categorized as Mostly Retail (>80% of product sold directly to end consumers), Mostly Wholesale (>95% sold to wholesale outlets), and Hybrid (significant quantities of both direct-to-consumer and wholesale channels).

The Benchmarking Study found that a typical food hub operates at close to a break-even level, with average profits of -2%. The highest-performing 25% of food hubs reported a profit of 4%. “Mostly Retail” hubs reported a positive profit of 6%, while “Mostly Wholesale” and “Hybrid” hubs saw small average losses. Calculated average profits for for-profit food hubs were 1%, compared with nonprofit food hubs, which saw -7% profit before grant income and charitable contributions.

According to the authors, greater labor productivity may have contributed to the profitability of the top 25%. They speculated that this greater productivity might have been related to staff compensation. The top hubs were paying workers 39% more per full-time equivalent than the average. The 25% most profitable food hubs also had a Costs of Goods Sold (COGS) that was three percentage points lower than the average COGS as a percent of total revenue. This means that farmers and food producers selling to the most profitable hubs were, on average, receiving a smaller share of each sales dollar. It does not necessarily mean that those farmers received lower prices; it could rather mean that profitable food hubs were charging a larger markup for their services than other food hubs.

Building upon the conclusions of Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly (2012), the Benchmarking Study authors found that average firm profits shifted from negative in the \$750,000-\$1.5 million sales bracket to positive in the >\$1.5 million sales bracket.

Confirming the importance of years in operation, they also saw profits shift from large average

losses in the first 0-5 years of operation to small positive profits in the 5-10 year age range. In addition to benchmarking profitability, the Benchmarking Study calculated benchmarks for gross margin, costs of sales, net worth, Current Ratio, blended debt term, blended effective interest rate, customer and vendor concentration, labor as a % of sales and revenue, sales and revenue per worker equivalent, and labor expenses per FTE. Some of these figures are reflected in the benchmarks that we chose for our own case studies (see Chapter 3).

After the release of the first Food Hub Benchmarking Study, an unpublished work by Matson and Barham attempted to model food hub financial growth in order to determine a “viable” scale for food hub business models (2015). The authors developed a set of assumptions about “typical” food hubs and created a framework dividing food hub development into four stages: startup, breakeven (covering operating expenses but not necessarily interest or depreciation), growth (becoming “cash flow neutral” with no money set aside for growth or unexpected events) and viability (yielding a 5.5% return for investors or for reinvestment in the food hub). Arguing that the best way to categorize food hubs is by the markets they serve, the authors structured their analysis to address three distinct operational models: a wholesale operational model, a direct-to-consumer operational model, and a “hybrid” model serving both wholesale and consumer markets. Projections of fixed and variable expenses were drawn from the authors’ previous food hub research and from the Food Hub Benchmarking Study. These were used to conduct a breakeven analysis of each model and to create pro forma financial statements. Based on this process the authors proposed sales levels for breakeven and viability, shown in Table 1.

Table 1: Operational Model & Period Comparisons
(from Matson & Barham, 2015)

Operational Model	Staff Levels at Viability (FTE)	Breakeven Sales	Viability Sales
Wholesale	6.3	\$1.21 Million	\$2.4 Million
Direct to Consumer	1.8*	\$314,000	\$567,000
Hybrid	6.3*	\$1.19 Million	\$2.36 Million

*Additional volunteer labor not included.

The authors point out that small amounts of outside funding, such as charitable dollars, would dramatically reduce breakeven sales levels due to decreased costs of capital. They also point out that small changes in Costs of Goods Sold or costs of sales (such as greater-than-expected variable labor costs) can dramatically increase breakeven. While based on a highly stylized set of assumptions, this study supports the idea that breakeven for hybrid and wholesale food hubs could occur in the \$1-1.5 million range. However, it challenges the idea that breakeven sales are sufficient to sustain a food hub in the long run, and demonstrates the vulnerability of profits to small variations in variable costs. The study was presented on a National Good Food Network webinar in April 2015 and was said to be slated for publication, but has yet to appear in print.

In summary, the available data on food hub finances confirms that food hubs as a whole are struggling with profitability, especially in their early years. This suggests that, like most startup businesses, they are at a high risk for insolvency during their startup phase unless they are highly capitalized at the outset. However, business model matters. There are large differences in gross margins and possibly in breakeven levels for food hubs focusing on direct-to-consumer vs. wholesale sales. So, any analysis of a food hub must take place in the context of its business model. Furthermore, since food hubs are triple-bottom-line businesses, expectations for their financial performance must take into consideration their social and environmental objectives.

A number of single-case and comparative case studies have delved into questions about food hub viability and sustainability, sometimes providing basic data about annual sales, gross margins, or solvency from active hubs (Stevenson, 2009; Feenstra, Visser, & Hardesty, 2011; Diamond & Barham, 2012; Brislen, Woods, Meyer, & Routt, 2015). To our knowledge, however, none of these studies have provided a comparative analysis of food hub financial documents in tandem with narrative information about the history and context of each operation. In particular, no prior study has used a set of financial metrics to highlight and understand challenges and opportunities faced by particular food hub businesses. Our study attempts to do this.

2.3 Challenges in Achieving Food Hub Viability

In developing research questions for food hub case studies, it has been helpful to review how other authors have documented the challenges faced by food hubs. Persistent challenges cited in the 17 food hub manager interviews by Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly (2012) included:

- **Balancing supply and demand** in the face of limited local production, fluctuating seasonal supply, and product supply mismatched to demand;
- **Price sensitivity of customers**, which makes it difficult to cover operating costs and makes customers less likely to make long-term purchasing commitments;
- **Managing growth** to keep pace with market demand, which includes knowing when to make timely investments in infrastructure;
- **Access to capital** for infrastructure investments and short-term credit needed for adequate cash flow; and

- **Other issues** including reliance on volunteer labor and in-kind contributions, finding reliable seasonal and part-time staff, meeting buyer specifications, managing inventory, maintaining farm identity along the supply chain, meeting food safety requirements with smaller producers, and investing in additional infrastructure and IT platforms without external funding support. Managers also cited the precarious nature of being in the low-margin food distribution business, where weather factors and perishability introduce a large amount of uncertainty.

The National Food Hub Survey findings closely mirrored those of Barham et al.

Respondents were presented with a list of potential operational challenges and asked to indicate their greatest, second-greatest and third-greatest operational challenge. The six challenges identified by at least 10 food hubs (in a sample of 107 hubs) were: managing growth, balancing supply and demand, accessing capital, finding appropriate technology to manage operations, negotiating prices with producers and/or customers, and finding reliable seasonal and/or part-time staff. The eight other possible challenges in the list were selected by fewer than ten respondents. These included inventory management, dependence on volunteer labor, meeting food safety and regulator requirements, meeting buyer specifications and maintaining product source identification (Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013).

A University of Kentucky case study on the failure and shutdown of Grasshoppers Distribution LLC gives another perspective on food hub challenges (Brislen, Woods, Meyer, & Routt, 2015). While no study has looked broadly at the reasons for food hub shutdowns in the United States, this case gives a specific example of what can go wrong. Grasshoppers Distribution was founded in 2006 by a group of Kentucky farmers. It served over 70 food producers and saw annual sales of nearly \$1 million before it ultimately went out of business in

2013. The business received substantial state, national and federal funding, as well as private investments, but experienced negative profits throughout its lifetime. It struggled with constant transition and went through five different general managers. An analysis of the business' financial records, together with interviews with staff and affiliates of the food hub, was used by the authors to identify causal factors in the business' collapse. These included staff inexperience and staff turnover, running too many different enterprises (wholesale, aggregated CSA etc.) without enough focus, policies that disallowed the food hub from competing with farmers, growth in debt and grant obligations that led to loss of control over the firm, and inflexible pricing schemes that did not enable competitive or strategic pricing. After reviewing financial statements of Grasshoppers Distribution, authors urged other food hubs to keep separate records for their charitable or business development activities and their aggregation/distribution activities so that managers could more easily track business performance.

Clearly the challenges experienced by each food hub are various, and dependent to a large extent on its structure and business model. However, the issues of pricing, balancing supply with demand, staffing, and startup capital (including managing the expectations of charitable and non-charitable capital providers) appear to be shared across many hubs. Food hubs are also likely to share the challenges of other types of small businesses. Next we will turn to a broader discussion of the characteristics of small and startup businesses, since these describe the majority of food hubs in the National Food Hub survey (Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013).

2.4 Capital Structures of Small and Startup Enterprises

A large body of literature has sought to shed light on the challenges and characteristics of small and startup enterprises. In this section we focus on literature about their capital structure, which is relevant because of how it affects both financial metrics and available options for managers. Undercapitalization is often given as a reason for small business failure, consistent with the food hub challenges mentioned in the previous section. For example, in a review of 300 official reports of involuntary business liquidations in England, undercapitalization was the most frequently cited reason for business failure, ranking above staffing issues, poor accounting management, rising costs, and numerous other factors (Hall & Young, 1991). Thus, understanding factors affecting capital structure has been a focus of small business scholars.

Unlike larger firms, small firms and new ventures are likely to encounter imperfect capital markets with high transaction costs that discourage them from seeking outside financing (Ang, 1991; Stouder & Kirchoff, 2004). This phenomenon is said to result in a “finance gap” for small enterprises. Small business owners may have limited information about available financing (a “knowledge gap”), and may also encounter difficulties with finding lenders willing to deal with small businesses (a “supply gap”) (Groves & Harrison, 1974; Garvin, 1971). Furthermore, the costs of providing information to outside stakeholders can be high relative to the size of the transactions themselves (Holmes, Dunstan, & Dwyer, 1994; Ang, 1991). Functionally, the information requirements of private lenders are equivalent to small businesses paying a premium to obtain external funds, so the cost of capital from internal sources may be less than the cost of capital from external sources such as banks. Perhaps for these reasons, empirical studies show that new and small enterprises tend to use internal sources of capital, for example from the owner or leadership team, more than external sources of funding from outside

investors and banking institutions (Landstrom & Winborg, 1995; Stouder & Kirchoff, 2004). In fact, in a survey of 74 small businesses, Stouder and Kirchoff (2004) found that 75% of their respondents did not use any external funding at all. In addition to explaining the use of internal capital, the “finance gap” could also explain why small firms sometimes rely on short-term loans to finance long-term assets, because finding banks who will give them long-term loans is too difficult (Levin & Travis, 1987; Welsh & White, 1981).

Providing a different perspective, Holmes & Kent (1991) argued that small businesses deliberately choose internal funding because it ensures that they maintain control over the assets and operations. These researchers referenced the “pecking order” framework described by Myers (1984), who suggested that business owners seek capital based on a “pecking order” of most- to least-preferred funding sources based on how “safe” they are perceived to be. In Myers’ pecking order framework, internal equity is expected to be at the top (safest) and external equity is at the bottom (least safe), with debt in between. Holmes & Kent expanded on this idea by suggesting that small business operators follow a somewhat different pecking order from large businesses, preferring short-term debt and owner contributions to a greater extent. The authors argued that small businesses choose short-term debt (including short-term bank loans and trade credit from Accounts Payable) because it carries fewer restrictive covenants than long-term debt. The small business pecking order framework contrasts with the idea that small firms use owner capital and short-term debt because lenders will not make long-term loans them.

The pecking order concept may be especially relevant to triple bottom line businesses that wish to protect their commitment to social and environmental responsibility. For example, some food hub managers in our screening interviews expressed unwillingness to pursue equity financing because they did not want investor control to endanger their mission. The case of

Grasshoppers Distribution suggests that even charitable external funders can influence food hubs in ways that divide focus and throw the business off course (Brislen, Woods, Meyer, & Routt, 2015). Thus, managers may have reason to be choosy about sources of capital, even when capital options are limited.

One way of avoiding outside financing is to engage in “bootstrapping.” Freear, Sohl, & Wetzel Jr. (1995) defined bootstrapping as “creative ways of acquiring the use of resources without borrowing money or raising equity financing from traditional sources.” Windborg and Landström (1997) distinguished between “bootstrapping measures used for capital minimization,” which make it possible to operate with less capital, and “bootstrapping measures to meet the need for capital”. Their survey of 262 small businesses found the most popular strategies for capital minimization to include buying used equipment (used by 78% of respondents), charging interest on overdue payments from customers (used by 41%), hiring personnel for shorter periods instead of employing them permanently (used by 40%) and leasing equipment instead of buying (used by 33%). The most popular bootstrapping measures to meet the need for capital included seeking the “best conditions possible with suppliers” (used by 74% of respondents), withholding managers’ payment for periods of time (used by 45%), deliberately delaying payment to suppliers (used by 44%), and obtaining payment in advance from customers (used by 33%). The authors also observed differences in bootstrapping techniques among several different types or “clusters” of small businesses. The “traditional trading business” cluster, which seems to most closely resemble food hubs and other wholesalers, was found to employ “relatively great use of minimizing cash management routines, focused on Accounts Receivable.” Most of these bootstrapping measures turn out to be relevant in the behaviors of food hubs, as we will see.

The strategy of seeking fast payment terms on receivables and longer terms on payables, as suggested in the Windborg & Landström results, has been discussed in food hub literature (McCann & Lyons, 2015). However, some food hubs choose to use short payment terms because of their mission-driven commitment to increasing farmers' cash flow. In fact, these hubs see paying farmers quickly as a part of what makes their services unique and important in the value chain (Rozyne & Hodges, 2012; Johnston, 2014). Compared with other small businesses, hubs that operate this way are constricted in their ability to generate net cash flow without obtaining a line of credit. However, they can still emphasize rapid collection of receivables in their strategy.

Capital structure is important in food hub financial analysis because it impacts measures of liquidity and solvency as well as the potential growth trajectory of the business in general. In accessing capital, we might expect food hubs to face a two-fold challenge. First, they likely face the same capitalization challenges as other small businesses, including limited information about financing sources, high transaction costs for external financing, disinterested lenders, and the risk involved in trading control for financing. Second, they have restrictions of their own, such as the commitment to pay growers quickly, the need to maintain control over their mission, and thin profit margins that are unappealing to most investors.

Anecdotally, service providers and some food hub managers have suggested food hubs need to capitalize themselves more generously and make infrastructure investments earlier in their growth than they are currently doing. The factors outlined in this section help explain why food hubs might tend to put off seeking outside capital beyond what is absolutely necessary. Furthermore, given their constraints, it is not surprising that many food hub managers turn to charitable funding as an alternative source of capital and cash, even though charitable funding

comes with obligations of its own. Recall that in the National Food Hub Survey, 40% of food hubs reported using grant funding for startup and 49% said they were still at least somewhat reliant on “outside” funding (Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013).

2.5 Interpreting Financial Measures for Small Firms

Partly for the reasons explored in the previous section, scholars of small businesses warn against interpreting small business financial statements in the same way that one would for large businesses. Such caveats are clearly relevant for the present study.

Small firms may exhibit blurry distinctions between debt and equity (Ang, 1991) or between personally-owned and company-owned assets (Levin & Travis, 1987). This ambiguity can cause confusion in interpreting financial statements. For example, small business owners may make a strategic decision to make loans to their firms rather than equity investments (Stouder & Kirchoff, 2004; Levin & Travis, 1987). Levin and Travis explain,

Sometimes what appears as a loan is really an easy-to-retrieve equity investment.

Consider the individual who wants ready access to his or her investment in the business. He or she could hold stock, but the bank might restrict the repurchase of shares. And if the company goes under, he may come up empty handed. If he lends the funds to the corporation instead, management can free the money by simply paying the debt. (1987)

Additionally, the authors point out, owners of start-up firms are likely to pledge personal assets as collateral if they wish to obtain debt from lenders. Or, in order to avoid taxes, owners may choose to personally own fixed assets and rent them to their company, which hides the fact

that those assets functionally belong to the company. To accommodate for this, Levin and Travis suggest including personal financial records in the evaluation of how the company is doing. This makes it possible to see changes in the equity of both the company and the individual, to measure the after-tax income of both, and to consider company plus personal assets in calculations of ROA. While this advice may only apply directly to the ~47% of food hubs that are privately owned (Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013), other food hubs often have unusual arrangements such as rent-free borrowed equipment, private loans made without expectation of timely repayment, or equipment that belongs to a parent organization. Looking closely at unusual loans, borrowed assets, and the role of parent companies or organizations would make it possible to better understand these hubs' financials.

Levin & Travis also argue for relaxing the conventional expectation that the sources and uses of capital should be matched, i.e. that short-term debt should not be used to finance fixed assets. A “mismatch” may be acceptable, the authors suggest, so long as managers are doing cash flow budgeting that will warn them of potential cash shortfalls. Relatedly, Welsh and White (1981) discourage a strict interpretation of the Current Ratio in small businesses because small businesses rarely have the same choice of financing that large businesses do. Debts that appear to be short-term may sometimes be long-term loans from banks that wish to check up on the status of their small creditor every few months. If the firm negotiates long Accounts Payable terms, which is one way of bootstrapping to increase cash flow without loans, it makes the Current Ratio worse. The authors urge readers to remember that a Current Ratio of less than 1 does not necessarily mean a business cannot service its debts, and that small, profitable, rapidly growing businesses often have poor Current Ratios because of the investments that they make in order to grow. This logic is consistent with the observations of RSF Social Finance, a lender that

finances food hubs, which reports that even financially strong food hubs tend to have negative working capital (Vanderburgh-Wertz & Ram Moraghan, 2014). Negative working capital is mathematically equivalent to a Current Ratio of less than one.

2.6 Approaches to Measuring and Evaluating Food Hubs

In general, managers have two options when evaluating their business (Duffy, Edwards, & Kay, 2011, pp. 103-104). They can:

- **Compare themselves to others**, using individual or averaged benchmarks from other firms in related industries; and
- **Compare themselves to themselves**, specifically by:
 - **Trend analysis:** Comparing present performance to past performance, e.g. comparing the current month to the same month in the previous year, and
 - **Budget analysis:** comparing present performance to budgeted goals and objectives in the business plan.

In practice, managers are advised to use some combination of these two methods, which is what we will do in our analysis. In the next chapter, we assemble benchmarks from various food-related sectors so that food hubs can compare themselves to whichever sectors are the most relevant to their business model. However, the benchmarks require care in interpretation.

Evaluation against benchmarks may be less important than looking at the food hub in the context of its own business model and history, as well as its social responsibility objectives. The evaluation should also be done in a way that is practical and useful. Fortunately, several authors provide guidance on the practical evaluation of food hubs.

Wholesome Wave, a socially responsible investor that works closely with food hubs, has created a comprehensive toolkit to help other lenders, investors and funders evaluate hubs. Wholesome Wave's framework provides specific measures within all of the following categories: business plan & strategy, market overview, marketing and sales, operations, organization & management, risk mitigation, technology & systems, and finance (Vanderburgh-Wertz & Ram Moraghan, 2014). Because food hubs are triple bottom line businesses, the authors also include a framework for impact potential, including social, environmental, and community economic impacts. With the exception of some business plan and financial metrics, which are cited in Chapter 3, the majority of measures identified by Wholesome Wave are not incorporated into the present case study. However, Wholesome Wave's framework remains extremely useful for a full evaluation that considers a food hub's growth potential and community impact.

Another useful framework for food hub evaluation comes from Robin Morris of Mad River Food Hub, who teaches the finance curriculum for the Food Hub Manager Certificate Program at the University of Vermont. Mr. Morris highlights the importance of using metrics "to drive improvements and help businesses focus their people and resources on what's important." He recommends that managers create a dashboard of easy-to-understand metrics that reflect the various strategies and priorities of the organization. Good metrics, he says, should "drive strategy and direction, provide focus for all parts of an organization, help make decisions, drive performance, change and evolve with the organization, and produce good internal and external PR" (Morris, 2014). Morris (2015) shares a framework for organizing data and reporting, shown in Figure 1.



How Much Data and When? The Reporting Pyramid

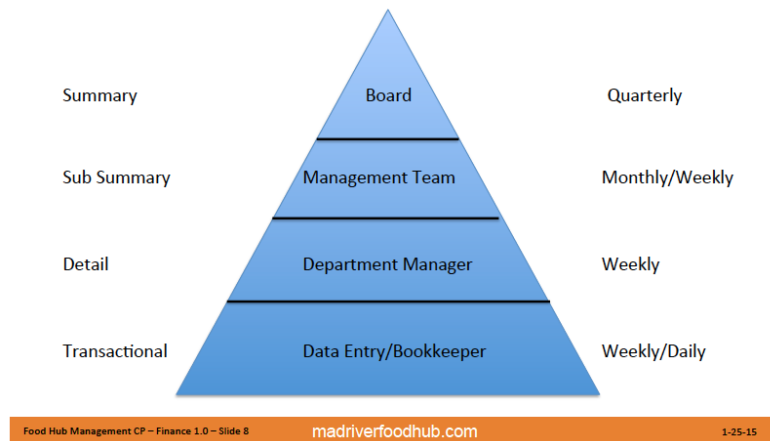


Figure 1: The Reporting Pyramid (from Morris, 2015)

Note: This image was created as part of a presentation for the University of Vermont's Food Hub Manager Certificate Program.

This framework invites food hub managers to think about a hierarchy of metrics that will be reviewed quarterly, monthly, weekly, and daily. The example given by Morris illustrates the tracking of sales revenue. Individual invoices showing sales per order are reviewed daily or weekly by a bookkeeper. Total customer orders are reviewed weekly by a department manager. Revenue per program, for example distribution vs. processing revenue, is reviewed weekly or monthly by the whole management team. Total revenue is reviewed quarterly by the board of directors. Thus, each level of data review corresponds to a level of decision-making in the business, and is matched to the appropriate personnel for that decision-making. This framework has been helpful in thinking about the frequency and process with which food hubs should use each of the proposed key metrics in our own “dashboard.”

2.7 Summary

Food hubs are triple bottom line businesses that serve as valuable marketing intermediaries for local and regional producers, whether by brokering, aggregating, processing, and/or distributing local food. As we have seen, the variation in food hub business structures makes it difficult to generalize from available data, but a growing literature shows that food hubs struggle to make a profit, especially in their early years. Nonetheless, a number of food hubs have successfully passed their breakeven point while continuing to deliver valuable community services. Food hubs share some difficulties with other types of small businesses; in particular, they tend to be undercapitalized. Capital structures of food hubs may bear similarities to other small businesses that practice “bootstrapping,” rely on short-term borrowing and source much of their capital internally. Hubs face some additional constraints to their freedom in accessing capital, but can also access charitable capital not available to other types of small businesses.

All of these factors affect how we might interpret and use a food hub’s financial data. As described in small business literature, we should expect working capital to be limited, look carefully at assets and liabilities on the balance sheet, and try to understand how the business is using other resources beyond those it owns. We should also place our analysis in a broader context of the business’ strategy, positioning, and social responsibility objectives, and try to design metrics accordingly. Finally, metrics should be measured with the appropriate frequency and reviewed by the appropriate people in order to be useful for operational decision-making.

In the next chapter we will utilize our findings from the literature to propose a specific set of metrics for managers to assess their own food hubs, and a methodology for doing so.

CHAPTER 3

METHODS AND PROCEDURES

3.1 Introduction

Case study designs must be carefully structured in order to deliver rigorous results. To structure our comparative study, we conducted a review of metrics used by industries similar to food hubs, consulted with food hub experts on our proposed “dashboard” of metrics, and compiled numerical benchmarks from various sources including the wholesale, retail and food hub sectors. We developed an interview process for food hub managers and used face-to-face visits to screen 10 possible study participants, ultimately identifying four food hubs that could provide the necessary data and diversity for our case analysis. Finally, we conducted individual three-year analyses of each food hub using their financial and interview data, returned the analyses to the food hub managers for feedback, and analyzed themes across the results. This chapter describes our methods in detail.

3.2 Multiple Case Study Research Design

Yin (2003, p. 9) recommends conducting case studies as a means of answering “how” or “why” questions about a contemporary set of events over which the investigator has little control. Many researchers have found case studies suitable for understanding the historical development and characteristics of agents, such as businesses or organizations, that cannot be controlled experimentally.

Multiple or comparative case study research designs provide the opportunity to compare and contrast several units of analysis. While a single case study might be useful in understanding a business that has an exceptional or unusual story, a comparative case study

allows us to look for patterns and processes that might be more generalizable across multiple businesses. Yin points out that multiple case study designs can produce more powerful analytic conclusions than single case studies. This is particularly true when common conclusions arise from cases in differing contexts. Multiple case studies also offer a means to explore difference by comparing results from contrasting situations (p. 53-54).

Yin cautions against using case studies to make “statistical generalizations” about characteristics of a particular population. Rather, case studies should point toward “analytic generalization” that explores the theoretical or policy implications of case study observations (p. 32). In the present study, analytic generalization enables us to use specific cases to identify processes, policies or decisions that may be helping or hurting food hubs’ financial sustainability in general. We use a common dashboard of key metrics as the starting point and framework for each analysis, which makes our methodology more easily replicable. Not only does the analysis uncover financial similarities and differences between food hubs, but it also illustrates a method that food hub managers can replicate to calculate their own key metrics, making a “case study” of their own businesses.

We have chosen a comparative case study research design using four cases. Each case provides a financial evaluation of a local food aggregation and distribution enterprise. Three of our cases look at businesses that engaged only in local food aggregation and distribution activities, so the unit of analysis for those cases is the entire business. One of the cases dealt with a business that conducted other activities in addition to aggregation and distribution, and in that case, our unit of analysis was the aggregator-distributor part of the business only. Although the two types of units of analysis differ somewhat, we treat them as being sufficiently comparable that both can be included in the same comparative case study.

3.3 Compiling Metrics from Related Firm Types and Industries

Before analyzing any food hub financial data, a review was conducted to identify financial metrics appropriate for local food hubs. We sought to answer two questions: (1) which performance metrics should food hub managers be using to evaluate their business and make decisions, and (2) which benchmarking data from other industries can be usefully compared to metrics from a food hub?

A variety of sources for financial metrics and benchmarking data were consulted, including the conventional grocery wholesale industry (Troy, 2013; First Research, 2015; United Fresh Produce Association, 2014), the conventional retail grocery industry (Troy, 2013), the cooperative retail grocery industry (National Cooperative Grocers Association, 2006), the farming industry (Center for Farm Financial Management, 2009), and other reports on food hubs (Vanderburgh-Wertz & Ram Moraghan, 2014; NGFN Food Hub Collaboration, 2015).

Additionally we interviewed Erin Pirro of Farm Credit East, a lead author of the Food Hub Benchmarking Study, about how the benchmarks in the study were chosen and the methodology used to calculate them.

Based on our research we drafted a “dashboard” of key financial metrics to use for our case studies, and a template with some guidance on how to interpret the metrics. We received reviewer comments on the dashboard and template from three service providers who work frequently with food hubs and their financial data: Kate Danaher of RSF Social Finance, Jesse Singerman of Prairie Ventures Consulting, and Robin Morris of Mad River Food Hub, who teaches workshops on food hub financial measures for the University of Vermont’s Food Hub Management Professional Certificate Program. These reviewers were recommended by staff at the Wallace Center at Winrock International, which organizes the national Food Hub

Table 2. Measures of Liquidity and Cash Flow

Measure	Calculation	Meaning	Interpretation	Ways to Improve	Sources
Days Receivable	$\frac{\text{Accounts Receivable}}{\text{Total Sales in week or month}} \times \text{days in week or month}$	Avg. number of days the business takes to collect payment owed by customers. If low, sales turn into cash quickly. If high, business is slow to collect on bills.	For cash flow, lower DR is better. Look at DR relative to Days Payable Outstanding. It is ideal to have DR shorter than Days Payable, but this may not always be possible. Set a goal for DR based on industry standards for customer type, and measure against this goal.	IF HIGH: Negotiate and actively enforce shorter payment terms with customers. Monitor aged receivables closely. If needed, it is appropriate to get a line of credit to fund receivables.	First Research, 2015; Vanderburgh-Wertz & Ram Moraghan, 2014; United Fresh Produce Association (UFPA), 2014
	$\frac{\text{Average inventory / COGS in week or month}}{\text{days in week or month}}$	Avg. number of days it takes for inventory to turn over completely. Businesses that sell more perishable product keep less inventory, so compare to benchmarks from companies with similar product mix.	IF LOW: Depending on business model, could indicate efficient inventory management and low stocking costs. But, could also mean facility is too small for product volume, which could be constraining sales or increasing the risk that stock runs out. IF HIGH: Inventory is taking longer to leave the facility. Is it constraining cash flow too much?	IF LOW: Ensure storage type is matched to storage needs; organize products efficiently; increase storage if needed. IF HIGH: To increase cash and reduce inventory costs, consider lower stocking positions. Pre-sell items when possible (e.g. process whole animal carcasses to order, instead of selling individual cuts.)	UFPA 2014; Vanderburgh-Wertz & Ram Moraghan, 2014
Days Payable Outstanding	$\frac{\text{Accounts Payable}}{\text{Total Sales in week or month}} \times \text{days in month}$	Avg. number of days the company takes to pay its bills. May be low if food hub pays its vendors upon receipt of product.	For cash flow, higher DPO is better. Look at DPO relative to Days Receivable as explained above. IF LOW: the business is paying vendors quickly and not asking them for much credit. Check if Current Ratio is strong and check the amount of available working capital, as DPO affects these.	IF LOW: Determine extent to which farmers / vendors need or demand short payment terms. If appropriate and necessary, lengthen payment terms to increase cash flow.	First Research, 2015; Vanderburgh-Wertz & Ram Moraghan, 2014
	$\frac{\text{Total current assets}}{\text{total current liabilities}}$	Ability to pay liabilities in the short run without disrupting operations. <1 means there are not enough current assets to pay off current liabilities.	Higher Current Ratios are needed if sales are less frequent or if Days in Inventory are high. IF LOW: there may be too much term debt or the business may be buying too much with cash. Look at dollar value of working capital too, to see actual size of available cash cushion.	IF LOW: Pay off short term debt if possible; restructure short-term debt into long-term debt; lower monthly bills; sell unproductive assets to increase cash; invest excess cash to earn interest; increase cash flow via favorable payment terms.	National Cooperative Grocers Association (NCGA), 2006; Troy, 2013; NGFN 2015

Table 3. Measures of Profitability

Name of Measure	Calculation	Meaning	Interpretation	Ways to Improve	Sources
Sales vs. Forecast Budget	Actual Sales / Forecast Sales	Comparison of actual to forecasted sales	Meeting sales targets is critical to meeting cash flow needs and profitability goals.	IF LOW compared to targets: revisit marketing, sales and pricing strategies.	Morris, 2015
Gross Margin (before Costs of Sales) (%)	(Gross Revenue - COGS) / Gross Revenue	Portion of each sales dollar remaining after Cost of Goods Sold. This is what's left for other expenses and profit.	Gross margins are determined by pricing. Appropriate gross margins depend on the customer, the product line, the nature of packing and delivery, and what the market will bear. Set reasonable targets in line with market realities, operating expenses and the business plan.	IF LOW compared to targets: Seek markets and products that offer higher margins; negotiate on prices; work with vendors to reduce COGS to the extent appropriate within the hub's mission. Evaluate and update business plan projections. Are they realistic?	NCGA, 2006; Troy, 2013; Morris, 2015
Operating Profit Margin (%)	(Sales – COGS – operating expenses + interest + taxes)/sales	Measures profitability without considering debt payments or tax status. Equivalent to the gross margin (which reflects pricing) minus operating expenses (which reflect efficiency and depreciation).	Check gross margins and operating expenses relative to each other and to benchmarks. To understand operating expenses, look at labor costs and at trends in top 5 largest expenses over time. Were the largest expenses variable (increasing with sales volume) or fixed?	IF LOW compared to targets: Is the gross margin adequate? See strategies for increasing gross margin. Are operating expenses under control? See section on efficiency. Is depreciation unrealistically high? See section on improving solvency measures.	NCGA, 2006; Troy, 2013; First Research, 2015
Return on Assets	(Net income + interest) / total assets	Measures return on each dollar invested in the business, allowing comparison with other types of investments. <i>Note: This measure can be volatile for businesses holding few assets, and may not always be useful.</i>	Look at Asset Turnover (ability to turn assets into revenue) and factors affecting operating profit. If ROA is low and Asset Turnover is good, look at COGS and other expenses, including depreciation and interest. Small asset size (e.g. from renting equipment) can make ROA large; large asset size (e.g. from owning equipment) can make it small.	IF LOW: Improve operating profit, improve Asset Turnover, review interest and depreciation expenses. Conventional wisdom says to seek ROA greater than the interest rate, ideally by 2%.	NCGA, 2006; Troy, 2013; First Research, 2015

Table 4. Measures of Efficiency

Name of Measure	Calculation	Meaning	Interpretation	Ways to Improve	Sources
Revenue per Worker Equivalent (or Sales per Worker Equivalent)*	Revenue / Average FTE	Measures how efficiently <i>staff time</i> is generating sales.	IF LOW , may suggest labor inefficiencies, or that the food hub is focusing on activities that do not result in sales. (Note that for food hubs this measure is usually above conventional benchmarks.)	IF LOW: Increase efficiency with division of labor, clear responsibilities, investments in qualified staff, training, and reduced turnover. Consider mechanization options to improve staff productivity. Consider marketing, sales, and how staff activities lead to revenue.	NGFN, 2015
Labor to Income Ratio (%) (or Labor to Sales Ratio)*	Personnel expenses / revenues	Measure of how efficiently <i>payroll expenses</i> (wages, salaries benefits and other payroll costs) are generating revenue.	Calculate for each program if possible. A lower value may suggest greater efficiency but can also reflect low staff compensation.	IF HIGH: See recommendations on staff efficiency. IF LOW and if Revenue per Worker Equivalent is below benchmarks, staff wages may be below average. See section on compensation.	NCGA, 2006; Troy, 2013; NGFN, 2015
Vendor Concentration (%)	\$ COGS from top 10 vendors / total sales	Portion of sales derived from 10 vendors who sell the most to the food hub. High concentration can reduce expenses by lowering transaction costs of each purchase. But it may not align with the hub's mission, and poses risks.	IF LOW: Look at time and labor involved in working with many vendors. Are there ways to reduce these transaction costs? IF HIGH: Is the food hub at risk if it loses a vendor? Is there a back-up plan in place for filling orders if a large vendor leaves?	IF HIGH: Develop redundant product sources, or discuss effects of vendor concentration with key vendors to put alternatives in place. IF LOW , ask: Should you increase sales from existing vendors before seeking others? If the mission requires sourcing from many farmers, how can you interact efficiently with vendors?	NGFN, 2015
Customer Concentration (%)	\$ sales to top 10 customers / total sales	Portion of total sales made to the 10 customers who buy the most. High concentration can keep transaction and marketing costs low as sales grow. But it's risky if a big customer has too much negotiating power or stops buying.	IF LOW: Look at time and labor involved in selling and taking orders, starting with Margin Minus Labor and variable costs. Will increased concentration need to be part of the food hub's strategy for scaling up?	IF HIGH , ask: If a large customer stops buying, are there programs to absorb excess? IF LOW: Consider how to increase sales without adding customers, e.g via an intermediary such as a distributor or a grocery service. Develop a product line targeting large customers.	NGFN, 2015
Asset Turnover Ratio	Gross revenue / average assets	Measures how efficiently the business uses assets to generate revenues. Impacted by efficiency in using both physical assets and monetary assets. <i>Volatile for hubs owning few assets.</i>	IF LOW , sales are low compared to the hub's assets. IF HIGH , indicates efficient use of assets or that the hub is using rented / donated infrastructure.	IF LOW , may have a scale mismatch: unproductive assets, too much equipment capacity, equipment sized for peak rather than average volume, or mismatched equipment type. Or, sales may still be catching up to infrastructure size.	NCGA, 2006; Troy, 2013; First Research, 2015

Table 5. Measures of Repayment Capacity and Solvency

Name of Measure	Calculation	Meaning	Interpretation	Ways to Improve	Sources
Debt Service Coverage Ratio	$\frac{\text{EBITDA}}{\text{scheduled principal and interest payments for year, where EBITDA} = \text{net income} + \text{interest} + \text{taxes} + \text{depreciation} + \text{amortization}}$	<p># of times the business can cover scheduled debt payments (principal and interest) using income it generates before taxes, depreciation and interest. Shows degree to which the business can endure cash shortfalls and still pay its debts on time. <1 means negative cash flow. Rule of thumb: maintain debt service coverage of 1.25 to 1.3.</p>	<p>IF LOW: Look at structure of debt: interest rates on each loan, interest as a % of gross margin or revenue, and total principal owed. Food Hub may be carrying too much debt or paying too much interest; it may have loans for too many fixed assets, which now affects cash flow. Ask: are these assets yielding adequate returns? Look at changes in ROA and Asset Turnover. Monitor and anticipate possible cash flow shortfalls, especially in low-volume months.</p>	<p>IF LOW: Refinance or pay off long-term debt to reduce interest payments. Increase Operating Profit Margins through operational efficiencies and/or increases in gross margin.</p>	<p>Center for Farm Financial Management, 2009; Vanderburgh-Wertz & Ram Moraghan, 2014</p>
Debt to Assets (%)	$\frac{\text{Total liabilities}}{\text{total assets}}$	<p>Portion of total assets that would need to be liquidated in order to pay off all liabilities, i.e. the portion of the business owned by lenders, creditors and other entities that are not the owners. Over 100% means the business is insolvent and would be unable to pay off all of its liabilities at one time. Below 50% is recommended.</p>	<p>IF HIGH, there may be a solvency issue. If most liabilities are current liabilities, there may also be a liquidity problem – check Current Ratio. If most debt carries interest, may lead to a debt repayment issue and a cash issue – check debt service coverage ratio. If operating profit is high enough, a hub with a high Debt-Asset Ratio will still be able to cover debts.</p>	<p>IF HIGH: Increase profits; build equity; pay off debts. Consider seeking charitable dollars that can be used for long-term assets that improve profitability. Consider raising equity from co-op members or shareholders. IF LOW compared to industry standards, and if profitability is good, the hub might consider more debt financing to take advantage of growth opportunities.</p>	<p>NCGA, 2006; Troy, 2013; First Research, 2015</p>

Collaboration (see <http://www.wallacecenter.org/foodhubcollaboration/>) and has worked closely with food hub experts all over the United States. In addition to providing comments regarding the dashboard, reviewers responded to questions about common financial challenges for food hubs, and which other metrics they found important. Since the analytic framework for our case study is based upon our dashboard of key metrics, an external review of the metrics was critical to establishing construct validity, as recommended by Yin (2003, p. 34).

Tables 2-5 give a detailed description of each metric, including its meaning, interpretation, and examples of publications that use it.

3.4 Compiling Benchmarks into a “Dashboard”

Once the list of key metrics were compiled, we collected benchmarks for each metric from various industries. Some of our benchmarks had to be manually calculated from published benchmarks so that they matched the format of our chosen metrics. The following benchmarks were manually calculated from published benchmarks:

- Days Receivable: Benchmarks from Cooperative Retail Grocers (NCGA 2006), and Broadline Wholesale and Conventional Retail Grocers (Troy 2013) were originally in “Receivables Turnover” format. To convert these to Days Receivable we made the assumption that the benchmarked businesses used a fiscal year of 365 days. We made the calculation:

$$\text{Days Receivable} = \text{Receivables Turnover} / 365 \text{ days}$$

- Days in Inventory: Similar to Days Receivable, benchmarks from Cooperative Retail Grocers (NCGA, 2006), Produce Wholesale (First Research, 2014) and Broadline

Wholesale and Conventional Retail Grocers (Troy 2013) were originally in “Inventory Turnover” format. We made the calculation:

$$\text{Days in Inventory} = \text{Inventory Turnover} / 365 \text{ days}$$

- Days Payable: Benchmarks from Produce Wholesale (First Research 2014) were originally in “Payables as % of Sales” format. Again we assumed a 365 day fiscal year. We used:

$$\text{Days Payable} = \text{Payables as \% of Sales} * 365 \text{ days}$$

- Asset Turnover: The Produce Wholesale benchmark (First Research, 2014) was given as the ratio of Total Assets to Sales. We calculated:

$$\text{Asset Turnover} = 1 / (\text{Total Assets to Sales})$$

- Gross Margin: The food hub benchmark given for Gross Margin (NGFN 2015) was Gross Margin After Costs of Sales, meaning Sales minus COGS minus variable costs of packing and delivery. Because we found it difficult to consistently replicate the methodology used in the food hub benchmarking study, and because other Gross Margin benchmarks use the more traditional format of $(\text{Sales} - \text{COGS}) / \text{Sales}$, we chose to adopt the traditional format. The benchmarking study also gave Costs of Goods Sold as a percent of total business revenue (sales, fees, etc.). To calculate Gross Margin Before Costs of Sales from the food hub benchmark, we used the following:

$$\text{Gross Margin Before Costs of Sales} = 1 - \text{Costs of Goods Sold (\% of Business Revenue)}$$

- Debt-Asset Ratio: The food hub benchmark (NGFN, 2014) was shown as “% Net Worth,” or equity as a percent of total assets. To find the Debt-Asset Ratio we calculated:

$$\text{Debt-Asset Ratio} = 1 - \% \text{ Net Worth}$$

A produce wholesale benchmark was not given for Debt-Asset Ratio, but current and long-term liabilities were given as percentages of total assets (First Research, 2014).

We used:

$$\text{Debt-Asset Ratio} = \text{Current liabilities (\% of assets)} + \text{long-term liabilities (\% of assets)}$$

When compiling benchmarks, we chose to include some food hub benchmarks that were variations on conventional metrics, reflecting charitable income. Specifically, we used both a Labor to Sales Ratio benchmark (reflecting the ratio of labor expenses to business revenue) and a Labor to Income Ratio benchmark (reflecting the ratio of labor expenses to business *and* charitable income) in calculating labor efficiency. We also used both a Sales per Worker Equivalent benchmark (reflecting business revenue per worker) and a Revenue per Worker Equivalent benchmark (reflecting business *and* charitable revenue per worker). Including both types of benchmarks made it possible to evaluate how labor dollars were used to generate sales, but also how they were used to generate dollars associated with charitable activities.

Table 6 shows the resulting “dashboard” of key metrics, including the external benchmarks (in the “To compare to others” column), and notes about interpreting each metric in the food hub’s own context (in the “To compare to self” column). Benchmarking data from the conventional wholesale, conventional retail, and food hub industries are included in the template, including benchmarks manually recalculated from published data. Cells in the “To compare to

Table 6: Proposed “Dashboard” of Food Hub Key Metrics

	Name of Measure	Calculation	Measure how often?	To compare to others		To compare to self
				Benchmarks from other businesses (see color key below for sources)		Suggested measurement
CASH FLOW & LIQUIDITY	Days Receivable	$(\text{Accounts Receivable} / \text{Total Annual Sales}) \times \text{days in fiscal year}$	Weekly	Broadline Wholesale	22.0	Increase/decrease against goal
				Produce Wholesale	30.0	
				Food Hub	Recommended <45 days	
	Days in Inventory	$(\text{Average inventory} / \text{Annual COGS}) \times \text{days in fiscal year}$	Weekly / Monthly	Broadline Wholesale	11.3	Increase/decrease against goal
				Produce Wholesale	6	
				Conventional Retail Grocer	29.2	
	Days Payable Outstanding	$(\text{Accounts Payable} / \text{Total Annual Sales}) \times \text{days in fiscal year}$	Monthly	Produce Wholesale	47.8	Increase/decrease against goal
				Food Hub	Recommended <30 days	
	Current Ratio	Total current assets / total current liabilities	Quarterly	Broadline Wholesale	1.7	Increase/decrease
				Conventional Retail Grocer	3.8	
				Cooperative Retail Grocer	3.34	
				Food Hub	2.39	
EFFICIENCY	Labor to Sales Ratio	Total personnel expenses / total sales	Monthly / Quarterly	Broadline Wholesale	3.00%	Increase/decrease against goal
				Conventional Retail Grocer	6.30%	
				Cooperative Retail Grocer	22.86	
				Food Hub	18.30%	
	Labor to Income Ratio	Total personnel expenses / total revenue	Monthly / Quarterly	Food Hub	16.40%	Increase/decrease against goal
	Sales per Worker Equivalent	Total Sales / Average FTE	Monthly / Quarterly	Food Hub	\$387,204.00	Increase/decrease
	Revenue Per Worker Equivalent	Total Revenue / Average FTE	Monthly / Quarterly	Food Hub	\$431,872.00	Increase/decrease
	Vendor Concentration	\$ COGS from top 10 vendors / total sales	Quarterly	Food Hub	29%	Intuitive based on business
	Customer Concentration	\$ sales to top 10 customers / total sales	Quarterly	Food Hub	35%	Intuitive based on business
Asset Turnover ratio	Gross revenue / average assets	Annually	Broadline Wholesale	5.4	Increase/decrease	
			Conventional Retail Grocer	5.8		
			Cooperative Retail Grocer	4.3		

Table 6: Proposed “Dashboard” of Food Hub Key Metrics (continued)

PROFITABILITY	Sales vs. Forecast Budget	Actual Sales / Projected Sales	Weekly	<i>Refer to food hub's own business plan</i>		% of target for business plan	
	Gross Margin before Costs of Sales (%)	(Sales - COGS) / Sales	Weekly / Monthly	Broadline Wholesale	16.3%	% of target for business plan, break down by program (wholesale, retail,	
				Cooperative Retail Grocer	36.0%		
				Food Hub	28.1%		
	Operating profit margin (%)	Return on Assets / Gross Revenue, where Return on Assets = net income + interest + taxes	Monthly	Broadline Wholesale	2.70%	% of target for business plan	
				Conventional Retail Grocer	2.40%		
				Cooperative Retail Grocer	0.98%		
	Return on Assets (%)	(Net income + interest) / total assets	Annually	Broadline Wholesale	18.90%	Increase/decrease	
				Conventional Retail Grocer	24.20%		
				Cooperative Retail Grocer	8.44%		
	SOLVENCY & REPAYMENT CAPACITY	Debt Service Coverage Ratio	EBITDA / scheduled principal and interest payments for year, where EBITDA = net income + interest + taxes + depreciation + amortization	Quarterly	Food Hub	Recommended above 1.1-1.5	Loan covenants
		Debt to Assets (%)	Total liabilities / total assets	Quarterly	Broadline Wholesale	84.70%	Increase/decrease
Conventional Retail Grocer					55.70%		
Cooperative Retail Grocer					59.33%		
Food Hub					32%		

Color key for sources of benchmark data

Type of business benchmarked	Citation	Size of business benchmarked	# of firms submitting data	Source of data
Broadline Wholesale	Troy, 2013	\$500,000 - \$1 million in assets	13339	Tax returns
Conventional Retail Grocer	Troy, 2013	\$500,000 - \$1 million in assets	31,783	Tax returns
Cooperative Retail Grocer	NCGA, 2006	Under \$2 million in sales	102	Voluntary financial statement submission
Food Hub (Actual Data)	NGFN, 2014.	All responding food hubs	48	Voluntary surveys & submission of financial statements
Food Hub (Recommendations)	Vanderburgh-Wertz and Ram Moraghan, 2014	N/A	N/A	Recommendations from lending institutions familiar with food hubs
Food Hub (Recommendations)	Danaher, 2015	N/A	N/A	Recommendations from lending institutions familiar with food hubs
Produce Wholesale	First Research, 2015	Under \$5 million in sales	Unknown	Financial industry data provided by MicroBilt Corporation, from 32 different data sources
Produce Wholesale	UFPA, 2014	Under \$15 million in sales	50	Voluntary surveys

others” column are color coded according to the source of each benchmark, and additional information about each benchmark source is given at the end of the table.

3.5 Selection and Recruitment of Food Hub Participants

The food hubs profiled in the case studies were selected from a list of 263 businesses in USDA’s 2014 Working List of Food Hubs. (At the time when we began making our selections, this working list was posted on a USDA website and had last been updated April 3, 2014. It is no longer available on-line.) Using readily available information from the food hubs’ web sites and elsewhere, the list was narrowed based on the following criteria: age of hub 3-11 years, products limited to local food, direct handling and aggregation of product, involvement in at least some wholesale marketing, geographic diversity, and apparent profit motive or desire to break even. (See full list of criteria in Appendix B). From the narrowed list, we selected, visited and spoke with eleven food hubs all over the United States about their financial practices. This group was further narrowed based on each food hub’s ability to supply at least three years’ worth of detailed financial statements. Four food hubs were selected that would provide variation in business structure (nonprofit, cooperative, and for-profit) and geographic region within the United States. These food hubs were invited to the study and all four agreed to participate. The information shared with us by the other seven food hubs is not included in our results, but helped to frame our research questions and informed our search for solutions to commonly mentioned problems.

In the remainder of this paper, the case study hubs will be referred to consistently as Food Hubs 1, 2, 3 and 4. As mentioned previously, there are only a few hundred food hubs operating in the United States. For this reason, to protect the anonymity of the case study hubs, we have

chosen not to share their geographic location or other details that could associate their identity with their numerical identifier. Because the information we collected was about businesses, and not about individuals, our project was granted Exempt Study status by the Institutional Review Board (IRB) at Iowa State University. (See Appendix A for the memo from IRB.) However, anonymity remained important for our study participants because the results contain sensitive information about the liquidity, solvency and profitability of each firm. Thus, we developed an agreement with each participant in which we committed to protecting their anonymity.

The aggregate characteristics of all four hubs are summarized in Table 7. The table illustrates the variation in characteristics across the cases.

Table 7: Case Characteristics

Geographic regions are classified using USDA Sustainable Agriculture Research and Education (SARE) regions. See map at <http://www.sare.org/About-SARE/SARE-s-Four-Regions>.

Geographic Region	Business Structure	Age (in final year of study)	Annual Sales (in final year of study)
1 hub from North Central region	1 for-profit	1 hub 5 years old	\$430,000
2 hubs from Northeastern region	1 nonprofit	2 hubs 6 years old	\$1.30 million
1 hub from Western region	2 cooperatives	1 hub 10 years old	\$1.44 million
			\$2.26 million

3.6 Food Hub Contextual Interviews

To provide context for the financial analyses, food hub managers and staff at all four case study hubs were interviewed in person. A 5-7 hour visit at each site was used to gather details about each hub's operations and facilities. The interviews were semi-structured, following the list of questions shown in Appendix C. Topics included the history of the food hub's growth, sources of capital, gross margins for different product lines, staffing structure, profitability,

business goals, pricing strategy, supplier relationships, anticipated breakeven points, equipment ownership, and how the food hub was managing its information. While not all interview questions related directly to the key metrics, they made it possible to understand how the each hub's business model and managerial decisions had impacted its metrics. The interviews also made it easier to understand the impact of practical constraints and values-based commitments on each business' choices, which would inform our recommendations about how to interpret and improve their metrics.

Food hubs submitted their financial data after the face-to-face interviews. Once the data was received, phone calls and emails were used to clarify any confusing aspects of each food hub's history or financial recordkeeping. In total, each food hub contributed about 7-10 hours of interview and communication time to the project.

3.7 Collection, Treatment and Analysis of Financial Data

Each food hub provided 3-5 years' worth of annual income statements and balance sheets, as well as additional information about the company's history, business plan, budgets, loan terms, and staff compensation. Specifically, each food hub was asked to provide the following:

- Income or P&L Statements (annual, 3-5 years)
- Balance sheets (annual, 3-5 years)
- Total amount of principal paid per year - OR - terms of any loans: amount, start date, type of loan, % interest, # of years, payment due dates
- *List of items/infrastructure rented and the value of rent paid*
- *List of staff positions and wages or salaries (excluding names of individuals)*

- *Reports of aged payables and receivables (current and/or historical info)*
- *A balance sheet from midway through each fiscal year*

Items shown above in non-italics were required from all of the food hubs participating in the analysis. Items listed in italics were optional for food hubs to submit. The only italicized item submitted by more than one hub was the information on staff positions.

As part of the financial analysis, we made adjustments to the financial statement figures to achieve a consistent methodology for calculating metrics across the cases:

- **Accrual adjustments:** If the business was operating on a cash basis, accrual adjustments were made to the income statement so that revenues were recognized in the same period as the expenses that helped generate them. The following adjustments were made:

Adjustments to total revenue:

Total Revenue (cash basis)
 + Change in Accounts Receivable (beginning to end of current period)
 + Change in Inventory (beginning to end of current period)
 = Total Revenue (accrual basis)

Adjustments to total expenses:

Total Expenses (cash basis)
 + Change in Accounts Payable (beginning to end of current period)
 + Change in outstanding taxes and interest (beginning to end of current period)
 = Total Expenses (accrual basis)

- **Depreciation:** To be consistent with the methodology of the Food Hub Benchmarking Study, we used straight-line depreciation for all depreciable assets. The value of vehicles was depreciated over seven years:

$$\text{Annual depreciation} = \text{vehicle purchase price} \div 7 \text{ yrs}$$

$$\text{Vehicle value this year} = \text{Vehicle value last year} - \text{annual depreciation}$$

Similarly, facilities and infrastructure were depreciated over 15 years. This required adjustments to both the income statement (in the depreciation line item) and the balance sheet (in the values of each depreciable asset and the accumulated depreciation). It resulted in higher asset valuations and lower depreciation expenses than what most hubs reported in their financial statements. This is probably because the food hubs were using IRS depreciation schedules, which tend to over-depreciate assets relative to their actual market value in the first few years of ownership. (Note: In cases where the balance sheet showed accumulated depreciation from years prior to our study period, it was not possible to fully adjust the accumulated depreciation on the balance sheet to reflect the straight-line method. Doing so would have required a breakdown of the values of depreciable assets owned in each year prior to the study. As a result, total assets in our calculations are probably somewhat lower than if depreciation were fully adjusted, and the metrics that depend on total assets are probably skewed.)

- **Transforming brokerage-model data into ownership-model format:** If a food hub was using a brokerage model and not taking ownership of product, we treated the brokerage fee as a gross margin and treated the dollars passed directly to farmers as “Costs of Goods Sold.” This made it possible to compare metrics from brokerage-model hubs to those of ownership-model hubs in an “apples to apples” fashion.

- **Charitable income:** As will be explained later, we calculated most metrics with and without grant income. If a grant appeared only on the balance sheet, we moved it off the balance sheet and treated it as income. This made it possible to see the impact of charitable funding on the business' financial health. We did not try to remove items from the balance sheet that had been purchased with grant funding in years prior to the study.
- **Costs of Goods Sold:** Costs of Goods Sold includes the cost of actual products, processing for those products, inbound freight costs incurred by the food hub to pick up or process the products, and any costs of repackaging products into appropriate containers. Costs of putting items into a box or pallet to fill an order would not be included in Costs of Goods Sold, but costs of dividing a 5 lb. bag of spinach into individual ½ lb. bags would be included in COGS. Where necessary, we rearranged expenses in the income statement so that Costs of Goods Sold met this definition.
- **Non-food-hub activities:** If a business conducted activities not directly involved in local food aggregation and distribution, such as running a farm or a substantial educational program, we tried not to include the income and expenses associated with these activities in our financial analysis.

Once the data had been collected and adjustments had been made, each food hub's data was compiled and analyzed in several ways. First, a financial summary was created summarizing information about the food hub's revenues, gross margin, profitability, expenses and revenue sources over the three years of data collection. Second, the dashboard of Key Metrics was calculated for each food hub for all three years. Third, a report of the top five operating expenses was created for each year. Additionally, in the three cases where detailed information about staff

FTE and compensation per position title was available, a more detailed analysis of staffing was conducted.

3.8 Case Studies and Case Reports

Yin (2003, p. 79) recommends beginning comparative case studies by conducting a study on a pilot case. Before finalizing the list of key metrics that would be applied to all of the food hubs, we conducted a pilot case on Food Hub 1 using a draft list of metrics. The results and food hub manager feedback from the pilot, as well as feedback from reviewers of our list of key metrics, were used to revise the list of metrics. The revised set of metrics was then used for the case studies of the remaining three hubs.

To complete the case studies, interview data was used to place each food hub's financial analysis in the context of its history of growth and to determine how the numerical data aligned or did not align with concerns and challenges expressed by the food hub managers. Each food hub was given a detailed report including its financial summary, table of key metrics, tables of top 5 operating expenses, staff wage comparisons, and a narrative discussing the results. The narrative also made recommendations for improvement of problem areas, based on the literature. Food hubs were asked to provide feedback on their report.

One challenge in analyzing food hubs is that they often rely on a combination of charitable and business revenue for their operations. During the completion of the pilot case, a manager of Food Hub 1 pointed out the use of grant revenue does not necessarily mean that a food hub would have been incapable of covering its expenses if grants had not been received. The receipt of a grant typically impacts a food hub's decisions about how to spend its money. At the same time, it can be valuable to look at a food hub's financial performance without taking

grant contributions into account, because this may give a better sense of the hub's actual profit and long-term financial sustainability. Therefore, we analyzed each food hub's financial status both *with* and *without* the inclusion of grant income.

Taken together, the four case study reports revealed both themes and differences across the food hubs. After completing the individual reports, we reviewed all four cases to identify and document these themes and differences. We then returned to the literature in search of solutions to commonly identified challenges. Findings from that second literature search are offered in the Recommendations chapter.

CHAPTER 4

RESULTS & DISCUSSION

4.1 Introduction

This chapter presents results and analysis from our comparative case studies of four food hubs. It begins by providing a financial overview of each of the firms in the study, then an analysis of key metrics across the four cases. We touch on themes among the firms, linking our findings back to our research questions and to literature on the unique challenges of food hubs and small businesses. Finally, we offer an evaluation of the usefulness of the proposed key metrics and benchmarks, and point out how recordkeeping choices can lead to difficulty in food hub financial analysis.

4.2 Descriptions of Cases

4.2.1 Overview of Case 1

Food Hub 1 is a cooperative that sells to both wholesale customers and direct-to-consumer (retail) markets. Products are aggregated from farmers in a single location and then distributed to buyers, using the food hub's own trucks and drivers as well as those of a partner company. For the wholesale component of the business, customers include grocery stores, restaurants, health food stores, farm to school, and institutional buyers. The direct-to-consumer retail portion of the business consists of a "food box" program similar to a Community Supported Agriculture (CSA) program, delivering prepaid, pre-packed food boxes directly to consumers on a regular basis. As with a CSA program, customers "subscribe" to the food box service and pay in advance to receive a series of food box deliveries, which are designed to meet

a household's various weekly food needs. Wholesale sales comprise about 90% of the food hub's sales, while retail food box sales comprise about 10%.

Both the wholesale and the retail program have advantages, according to the food hub's managers. Wholesale makes it possible to move a large volume of product and to scale up quickly. Retail sales require more packing time and more organization, but they help raise the profile of the food hub in the community. They also receive a higher gross margin than wholesale sales, and the prepayments for food boxes provide the hub with substantial cash (\$70,000-\$80,000) at the beginning of the season.

The food hub purchases and owns products before reselling them. Its policy is to add a fixed markup to the purchase price it pays to farmers. In reality, each product line fetches a slightly different markup; frozen goods are sold at a higher markup while other products such as eggs are sold at lower margins in order to be price-competitive. Having a flexible markup percentage allows the hub to negotiate more sales with customers, allowing higher-margin products to offset lower ones.

Table 8 shows a general financial summary for Food Hub 1 in 2011-2013. Table 9 shows Key Metrics for the food hub, compared with industry benchmarks.

Even without counting charitable income as income, Food Hub 1 showed a net margin greater than or equal to zero in 2011-2013, which was above the average net margin for food hubs from the 2014 Food Hub Benchmarking Study. The reason for this seems to stem from Food Hub 1's low operating costs (21-23%), which are smaller than the benchmark for food hubs (26.26%). The food hub had a lower gross margin than other food hubs, about 22-23% compared with 28.05%. These findings suggest that the food hub is efficient in its operations and effective at returning a large portion of sales dollars back to local farmers.

Table 8: Financial Summary for Food Hub 1

Business size

	Case Study Hub: 2011	Case Study Hub: 2012	Case Study Hub: 2013
Business Revenue	\$ 719,264.72	\$ 906,702.30	\$ 1,406,251.81
% Revenue Growth from Previous Year		21%	55.10%
Average Total Assets	\$ 45,839.66	\$ 76,993.20	\$ 144,181.60
Average Total Equity	\$ (13,961.61)	\$ 6,427.63	\$ 45,764.51
Number of FTE	no data	no data	no data

Abbreviated Profit & Loss (no grant revenue included)

	Wholesale Benchmark (Troy 2014)	Retail Benchmark (Troy 2014)	Food Hub Benchmark 2014	Case Study Hub: 2011	Case Study Hub: 2012	Case Study Hub: 2013
Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
- Cost of Goods	83.7%	75.4%	72.0%	77.3%	76.8%	77.0%
= Gross Margin before Costs of Sales	16.3%	24.6%	28.1%	22.7%	23.2%	23.0%
- Operating Expenses	13.2%	21.8%	26.3%	21.2%	21.7%	23.0%
= Net Margin	3.1%	2.8%	1.8%	1.5%	1.5%	0.0%

Sources of Revenue - % of total revenue*

	Food Hub Benchmark 2014	Case Study Hub: 2011	Case Study Hub: 2012	Case Study Hub: 2013
Net Product Sales	89.0%	100.0%	99.3%	97.0%
Delivery / Brokering Fees	0.6%	0.0%	0.0%	0.0%
Grants & Contributions	6.1%	0.0%	0.7%	3.0%
Membership Fees	0.6%	0.0%	0.0%	0.0%
Other Enterprise Income	2.6%	0.0%	0.0%	0.0%
Misc. Income	1.1%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

*breakdown of revenue types is drawn from the Food Hub Benchmarking Study.

Expenses - % of total revenue

	Wholesale Benchmark: (Troy 2014)	Retail Benchmark: (Troy 2014)	Food Hub Benchmark 2014	Case Study Hub: 2011 (no grants)	Case Study Hub: 2012 (no grants)	Case Study Hub: 2013 (no grants)
Cost of Good Sold	75.2%	73.4%	72.0%	77.3%	76.8%	76.98%
Advertising and promotional materials	0.1%	0.3%		0.1%	0.3%	0.2%
Bank Service Charges				0.3%	0.2%	0.3%
Consulting Services				0.0%	0.1%	0.1%
Data and Computer Services				0.1%	0.2%	0.3%
Depreciation (adjusted)				0.2%	0.1%	0.7%
Facility Rental				0.5%	0.2%	0.2%
Insurance (non-vehicle)				0.1%	0.2%	0.2%
Infrastructure Repairs & Maintenance				0.1%	0.7%	0.2%
Interest and Amortization	0.6%	1.2%		0.1%	0.1%	0.1%
Labor and Employment Costs	4.7%	6.5%	18.3%	12.6%	12.2%	11.4%
Packaging Equipment and Supplies				0.1%	0.5%	0.6%
Shipping and Delivery (3rd party)				3.0%	2.4%	2.9%
Truck expenses (rent, maintenance, repairs, fuel)				3.1%	3.3%	2.6%
Utilities				0.6%	0.6%	0.4%
Taxes	1.2%	2.3%	Not available	0.0%	0.0%	0.0%
Other expenses	9.6%	10.9%	Not available	0.4%	0.8%	2.6%
TOTAL EXPENSES (% of revenue)				98.5%	98.5%	100.0%
Net Margin	3.1%	2.8%		1.5%	1.5%	0.0%
TOTAL				100.0%	100.0%	100.0%

Table 9: Key Metrics for Food Hub 1

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)		Metrics for hub			Metrics for Hub 1 if grants are included in total revenue		
					2011	2012	2013	2011	2012	2013
CASH FLOW & LIQUIDITY	Days Receivable	(Avg Accounts Receivable / Total Annual Sales) x days in fiscal year	Broadline Wholesale	22.0	12.8	15.6	15.5	No difference when grants are included in revenue		
			Produce Wholesale	30.0						
			Food Hub	Recommended <45 days						
	Days in Inventory	(Avg inventory / Annual COGS) x days in fiscal year	Broadline Wholesale	11.3	7.8	9.4	11.4	No difference when grants are included in revenue		
			Produce Wholesale	6						
			Conventional Retail Grocer	29.2						
	Days Payable Outstanding	(Avg Accounts Payable / Annual COGS) x days in fiscal year	Produce Wholesale	47.8	27.4	26.3	17.6	No difference when grants are included in revenue		
			Food Hub	Recommended <30 days						
	Current Ratio	Total current assets / total current liabilities	Broadline Wholesale	1.7	0.68	0.86	1.22	No difference when grants are included in revenue		
			Conventional Retail Grocer	3.8						
			Cooperative Retail Grocer	3.34						
			Food Hub	2.39						
EFFICIENCY	Labor to Sales Ratio	Total personnel expenses / total sales	Broadline Wholesale	3.00%	12.6%	12.2%	11.8%	No difference when grants are included in revenue		
			Conventional Retail Grocer	6.30%						
			Cooperative Retail Grocer	22.86						
			Food Hub	18.30%						
	Labor to Income Ratio	Total personnel expenses / total revenue	Food Hub	16.40%				12.6%	12.1%	11.4%
	Sales per Worker Equivalent	Total Sales / Average FTE	Food Hub	\$387,204.00	Not available	Not available	Not available			
Revenue Per Worker Equivalent	Total Revenue / Average FTE	Food Hub	\$431,872.00				Not available	Not available	Not available	
Asset Turnover ratio	Gross revenue / average assets	Broadline Wholesale	5.4	15.7	11.8	23.6	28.6	23.5	23.6	
		Conventional Retail Grocer	5.8							
		Cooperative Retail Grocer	4.3							

Table 9: Key Metrics for Food Hub 1 (continued)

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)		Metrics for hub			Metrics for Hub 1 if grants are included in total revenue					
					2011	2012	2013	2011	2012	2013			
PROFITABILITY	Gross Margin before Costs of Sales (%)	(Gross Revenue - COGS) / Gross Revenue	Broadline Wholesale	16.3%	Wholesale: 22.0%	21.9%	21.8%						
			Cooperative Retail Grocer	36.0%							Retail: 28.6%	35.1%	33.0%
			Food Hub	28.1%							Overall: 22.7%	23.2%	23.0%
	Operating profit margin (%)	(Net income + Interest + Taxes) / Gross Revenue	Broadline Wholesale	2.70%	1.6%	1.6%	0.1%	1.6%	2.3%	3.2%			
			Conventional Retail Grocer	2.40%									
			Cooperative Retail Grocer	0.98%									
	Return on Assets (%)	Return on assets (\$) / total assets, where Return on Assets (\$) = net income + interest	Broadline Wholesale	18.90%	24.5%	18.3%	1.2%	24.5%	26.9%	31.9%			
			Conventional Retail Grocer	24.20%									
			Cooperative Retail Grocer	8.44%									
SOLVENCY & REPAYMENT CAPACITY	Debt Service Coverage Ratio	EBITDA / scheduled principal and interest payments for year, where EBITDA = net income + interest + taxes + depreciation + amortization	Food Hub	Recommended above 1.1-1.5	27.6	36.2	1.3	27.6	49.6	6.0			
	Debt to Assets (%)	Total liabilities / total assets	Broadline Wholesale	84.70%	130.5%	91.7%	68.3%	No difference when grants are included in revenue					
			Conventional Retail Grocer	55.70%									
			Cooperative Retail Grocer	59.33%									
Food Hub	32%												

Color key for sources of benchmark data

Type of business benchmarked	Citation
Broadline Wholesale	Troy, 2013
Conventional Retail Grocer	Troy, 2014
Cooperative Retail Grocer	NGC, 2006
Food Hub (Actual Data)	NGFN Food Hub Collaboration, 2014
Food Hub (Recommendations)	Vanderburgh-Wertz & Ram Moraghan, 2014; K. Danaher, personal communication, Dec., 4, 2015
Produce Wholesale	First Research, 2015
Produce Wholesale	UFPA, 2014

This food hub earned the majority of its income through business activities, but had on occasion accepted grants for specific projects. During the study period, Food Hub 1 received no more than 3% of its total revenue from grants or donations, suggesting that it was less dependent on outside funding than its food hub peers in the Benchmarking Study (who received over 6% from charitable sources, on average).

The food hub also capitalized itself with fees from co-op members, but apparently did not require a contribution of equity from members as they entered the co-op. Balance sheet records did not make it clear what portion of the co-op's equity was in individual member equity accounts as opposed to unallocated equity. Managers did mention that they had never paid a patronage refund to members, but that they might need to start doing so.

A breakdown of top expenses is shown in Table 10. Labor costs represented the Food Hub 1's largest operating expense, which is typical for food hubs. Trucking and delivery expenses were the next-largest expenses, with various overhead costs trailing behind. Shipping and delivery by a third party comprised a large portion of costs – larger than the food hub's own trucking costs in 2013. In interviews, food hub managers expressed concern about the cost of third party trucking, which allowed them to deliver geographic regions beyond the reach of their own routes. Because the food hub had a policy of maintaining the same gross margin for all of its wholesale sales, managers were concerned that the deliveries requiring the third party were costing them more without bringing them a higher margin. Without knowing what portion of total sales came from products delivered by the third party, though, it is difficult for us to say whether or not the third party was more expensive than the hub doing its own delivery.

Table 10: Food Hub 1: Top 5 Operating Expense Categories, Largest to Smallest

2011		
	% of total operating expenses	Expense
Labor and Employment Costs	59.4%	\$90,429.82
Truck expenses (rent, maintenance, repairs, fuel)	14.8%	\$22,464.12
Shipping and Delivery (3rd party)	14.4%	\$21,868.65
Utilities	2.6%	\$3,963.74
Facility Rental	2.3%	\$3,501.52

2012		
	% of total operating expenses	Expense
Labor and Employment Costs	56.2%	\$110,344.13
Truck expenses (rent, maintenance, repairs, fuel)	15.0%	\$29,541.27
Shipping and Delivery (3rd party)	11.3%	\$22,127.50
Infrastructure Repairs & Maintenance	3.1%	\$5,994.59
Utilities	2.5%	\$5,008.83

2013		
	% of total operating expenses	Expense
Labor and Employment Costs	51.3%	\$166,025.60
Shipping and Delivery (3rd party)	13.2%	\$42,668.70
Truck expenses (rent, maintenance, repairs, fuel)	11.5%	\$37,353.54
Depreciation (adjusted)	3.3%	\$10,731.88
Packaging Equipment and Supplies	2.8%	\$8,905.20

In 2013, a large depreciation expense resulted from the acquisition of a capital lease on a new truck. Since a capital lease involves placing the leased asset on the balance sheet, it is associated with a depreciation expense. In this case, the food hub originally depreciated the entire value of the truck in the first year. Without adjustments for straight-line depreciation, the depreciation expense would have been the second-largest expense in 2013. This illustrates the large impact that depreciation can have on measures of expense and profitability.

The appearance of packaging supplies in the top five expenses in 2013 suggests that after labor and trucking, packaging supplies were the food hub's largest variable cost. High

packaging costs often seem to be associated with food box programs, since they typically require repacking products into individual containers for each delivery. It makes sense that variable costs such as packaging would start to surpass overhead costs as the food hub's sales grew.

Overall, this food hub had the strongest financial position of the four cases. After struggling with prior losses which had left it with a Debt-Asset Ratio over 100% in the years before the study period, it was finally enjoying consistently positive profit. It had relatively high efficiency as measured by labor costs as well as overall operating costs. It was also continuing to grow its business revenue at a fast rate comparable to that of the younger hubs, with 55% growth in the final year of the study. However, managers still experienced challenges with farmers selling "around the hub" to customers cultivated by the hub. They also struggled with the apparently higher costs of longer-distance delivery services, and how to price these services appropriately. Negotiating pricing policy changes with farmer-members remained a difficult prospect for managers.

Notes on adjustments for Case 1: The set of standard adjustments described in the Methods chapter were made to Food Hub 1's figures. Depreciation was adjusted to reflect straight-line depreciation over seven years for vehicles and depreciation over 15 years for facilities and equipment. Accrual adjustments were not necessary because the food hub was already operating on an accrual basis. Grants and some grant expenses were monitored in separate accounts from business expenses, so it was not difficult to calculate key metrics both with and without grants.

4.2.2 Overview of Case 2

Food Hub 2 has a for-profit structure and, like Food Hub 1, utilizes two main sales outlets: a direct-to-consumer food box program and a wholesale program. In contrast to Food Hub 1, however, this food hub made 90% of its sales in 2014 through the food box program and the remainder through its new (but rapidly growing) wholesale program. Food box prepayments arrive at several times throughout the year, based on seasonal subscriptions, and managers report that the prepayments are beneficial for cash flow. The food hub takes ownership of all products. It rents its facilities but mainly owns its trucks. A financial summary and comparison of key metrics for Food Hub 2 are shown in Tables 11 and 12.

This food hub grew steadily from 2012 to 2014 in terms of gross revenues and number of staff. Net margin (profit) was close to zero in 2012, negative in 2013, and moderately large in 2014, showing some volatility in the food hub's profitability. (The volatility was much larger before adjustments for straight-line depreciation were made; the food hub originally showed a loss of more than 9% in 2013.) Grant and charitable income only had a noticeable impact on the food hub in 2014, when it constituted 3.8% of total income. In that final year, the hub received a grant which it converted immediately into a fixed asset, improving its solvency position.

Before adjustments were made to this food hub's balance sheet data, it appeared to have become insolvent when it incurred losses in 2013, and stayed insolvent in 2014. After we adjusted the balance sheet data (reflecting straight-line depreciation and no grant liability) the food hub was shown to have become highly leveraged in 2013, but never insolvent. During the study period this food hub enjoyed very high average gross margins compared to other food hubs, and certainly compared to conventional industries. In 2014 these came largely from its

Table 11: Financial Summary for Food Hub 2**Business size**

	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Business Revenue	\$ 583,199.52	\$ 931,888.64	\$ 1,304,132.47
% Growth from Previous Year	88%	60%	40%
Average Total Assets	\$ 56,100.22	\$ 126,985.47	\$ 211,301.47
Average Total Equity	\$ 26,919.79	\$ 44,172.11	\$ 47,334.41
Number of FTE	3.2	5.6	7.2

Abbreviated Profit & Loss (no grant revenue included)

	Wholesale Benchmark (Troy 2014)	Retail Benchmark (Troy 2014)	Food Hub Benchmarking Study 2014	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
- Cost of Goods	83.7%	75.4%	72.0%	66.7%	57.8%	55.7%
= Gross Margin before Costs of Sales	16.3%	24.6%	28.1%	33.3%	42.2%	44.3%
- Operating Expenses	13.2%	21.8%	26.3%	32.9%	43.5%	36.6%
= Net Margin	3.1%	2.8%	1.8%	0.5%	-1.4%	7.7%

Sources of Revenue - % of total revenue

	Food Hub Benchmarking Study 2014	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Net Product Sales	89.0%	100.0%	99.5%	95.6%
Delivery / Brokering Fees	0.6%	0.0%	0.0%	0.0%
Grants & Contributions	6.1%	0.0%	0.0%	3.8%
Membership Fees	0.6%	0.0%	0.0%	0.0%
Other Enterprise Income	2.6%	0.0%	0.5%	0.5%
Misc. Income	1.1%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

Breakdown of revenue types is drawn from the Food Hub Benchmarking Study.

Expenses - % of total revenue

	Wholesale Benchmark (Troy 2014)	Retail Benchmark (Troy 2014)	Food Hub Benchmarking Study 2014	Case Study Hub: 2012 (w/ grants)	Case Study Hub: 2012 (w/ grants)	Case Study Hub: 2012 (w/ grants)
Cost of Goods Sold	75.2%	73.4%	72.0%	66.7%	57.8%	55.7%
Advertising and promotional materials	0.1%	0.3%		0.3%	1.1%	1.0%
Bank Service Charges				1.4%	1.3%	1.4%
Consulting Services				1.5%	9.8%	3.9%
Data and Computer Services				0.0%	0.0%	0.0%
Depreciation (adjusted)	0.3%	0.5%		1.4%	1.6%	1.1%
Facility Rental				0.0%	0.0%	0.0%
Insurance (non-vehicle)				0.9%	0.9%	1.0%
Infrastructure repair and maintenance				0.1%	1.6%	3.6%
Interest and Amortization	0.4%	0.2%		0.1%	0.2%	0.1%
Labor and Employment Costs	3.6%	8.4%	18.3%	18.9%	14.7%	15.4%
Packaging Equipment and Supplies				0.3%	1.5%	1.3%
Utilities				0.0%	0.0%	0.0%
Shipping and Delivery (3rd party)				0.1%	0.5%	0.4%
Truck expenses (rent, maintenance, fuel)				1.1%	2.6%	1.4%
Taxes	0.7%	1.3%		0.6%	0.0%	0.0%
Other expenses				6.0%	7.7%	6.0%
TOTAL EXPENSES (% of revenue)				99.5%	101.4%	92.3%
Net Margin	3.1%	2.8%		0.5%	-1.4%	7.7%
TOTAL				100.0%	100.0%	100.0%

Table 12: Key Metrics for Food Hub 2

Measures in blue are based on year-end rather than average data, in cases where data was not available from the previous year.

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)	Metrics for Hub			Metrics for Hub 2 if grants are included in total revenue			
				2012	2013	2014	2012	2013	2014	
CASH FLOW & LIQUIDITY	Days Receivable	(Avg Accounts Receivable / Total Annual Sales) x days in fiscal year	Broadline Wholesale	22.0	Not available	Not available	6.6	No difference when grants are included in revenue		
			Produce Wholesale	30.0						
			Food Hub	Recommended <45 days						
	Days in Inventory	(Avg inventory / Annual COGS) x days in fiscal year	Broadline Wholesale	11.3	Not available	Not available	Not available	No difference when grants are included in revenue		
			Produce Wholesale	6						
			Conventional Retail Grocer	29.2						
	Days Payable Outstanding	(Avg Accounts Payable / Annual COGS) x days in fiscal year	Produce Wholesale	47.8	Not available	Not available	25.0	No difference when grants are included in revenue		
			Food Hub	Recommended <30 days						
	Current Ratio	Total current assets / total current liabilities	Broadline Wholesale	1.7	Not available	Not available	0.3	No difference when grants are included in revenue		
			Conventional Retail Grocer	3.8						
			Cooperative Retail Grocer	3.34						
			Food Hub	2.39						
EFFICIENCY	Labor to Sales Ratio	Total personnel expenses / total sales	Broadline Wholesale	3.00%	21.4%	16.8%	17.6%			
			Conventional Retail Grocer	6.30%						
			Cooperative Retail Grocer	22.86						
			Food Hub	18.30%						
	Labor to Income Ratio	Total personnel expenses / total revenue	Food Hub	16.40%				21.4%	16.8%	16.8%
	Sales per Worker Equivalent	Total Sales / Average FTE	Food Hub	\$387,204.00	\$179,559	\$165,299	\$179,535			
	Revenue Per Worker Equivalent	Total Revenue / Average FTE	Food Hub	\$431,872.00				\$179,559	\$166,159	\$187,739
Asset Turnover ratio	Gross revenue / average assets	Broadline Wholesale	5.4	10.4	7.3	6.2	10.4	7.3	6.4	
		Conventional Retail Grocer	5.8							
		Cooperative Retail Grocer	4.3							

Table 12: Key Metrics for Food Hub 2 (continued)

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)			Metrics for Hub			Metrics for Hub 2 if grants are included in total revenue				
			2012	2013	2014	2012	2013	2014	2012	2013	2014		
PROFITABILITY	Gross Margin before Costs of Sales (%)	(Gross Revenue - COGS) / Gross Revenue	Broadline Wholesale	16.3%	Wholesale: N/A	47.3%	20.9%						
			Cooperative Retail Grocer	36.0%				Retail: 33.3%	41.2%	46.5%			
			Food Hub	28.1%				Overall: 33.3%	42.2%	44.3%	Overall: 33.3%	42.2%	46.4%
	Operating profit margin (%)	(Net income + Interest + Taxes) / Gross Revenue	Broadline Wholesale	2.70%	1.2%	-1.0%	8.0%	1.2%	-1.0%	11.5%			
			Conventional Retail Grocer	2.40%									
			Cooperative Retail Grocer	0.98%									
	Return on Assets (%)	Return on assets (\$) / total assets, where Return on Assets (\$) = net income + interest	Broadline Wholesale	18.90%	5.8%	-8.3%	49.1%	5.8%	-8.3%	73.5%			
			Conventional Retail Grocer	24.20%									
			Cooperative Retail Grocer	8.44%									
SOLVENCY & REPAYMENT CAPACITY	Debt Service Coverage Ratio	EBITDA / scheduled principal and interest payments for year, where EBITDA = net income + interest + taxes + depreciation + amortization	Food Hub	Recommended above 1.1-1.5	4.8	0.5	6.2	4.8	0.5	8.9			
	Debt to Assets (%)	Total liabilities / total assets	Broadline Wholesale	84.70%	52.0%	65.2%	77.6%	No difference when grants are included in revenue					
			Conventional Retail Grocer	55.70%									
			Cooperative Retail Grocer	59.33%									
			Food Hub	32%									

Color key for sources of benchmark data

Type of business benchmarked	Citation
Broadline Wholesale	Troy, 2013
Conventional Retail Grocer	Troy, 2014
Cooperative Retail Grocer	NCG, 2006
Food Hub (Actual Data)	NGFN Food Hub Collaboration, 2014
Food Hub (Recommendations)	Vanderburgh-Wertz & Ram Moraghan, 2014; K. Danaher, personal communication, Dec., 4, 2015
Produce Wholesale	First Research, 2015
Produce Wholesale	UFPA, 2014

retail program as opposed to its newer wholesale program, which operated at a lower margin.

Keeping pace with the large margins, the food hub also had high operating costs.

These may be associated with its focus on resource- and labor-intensive retail sales. They may also reflect opportunities to improve operational efficiency.

Table 13 gives a breakdown of the food hub's top five operating expenses.

Table 13: Food Hub 2: Top 5 Operating Expense Categories, Largest to Smallest

Note: This table reflects straight-line depreciation of facilities and equipment over 15 years and vehicles over 7 years. This adjustment reduced depreciation from about \$98,000 to about \$15,000 in 2013. It dramatically decreased the apparent Operating Profit Margin losses in 2013.

2012	% of total operating expenses	Expense
Payroll	65.1%	\$124,793
Event Costs	4.6%	\$8,883
Depreciation (adjusted)	4.4%	\$8,338
Banking Fees	4.3%	\$8,216
Vehicle Expenses	3.3%	\$6,263

2013	% of total operating expenses	Expense
Payroll	38.3%	\$155,298
Professional Services	22.5%	\$91,215
Vehicle Expenses	5.9%	\$24,089
Depreciation (adjusted)	3.7%	\$14,999
Banking Fees	3.0%	\$12,267

2014	% of total operating expenses	Expense
Payroll	47.8%	\$228,099
Infrastructure Expenses	10.0%	\$47,486
Banking Fees	4.1%	\$19,698
Vehicle Expenses	3.9%	\$18,538
Packaging	3.5%	\$16,476
Depreciation (adjusted)	2.0%	\$9,581

Over time, variable costs (costs that increase as output increases) crept higher in the list of top operating expenses. Credit card processing fees (to receive online customer payments),

packaging, payroll and vehicle expenses are all largely variable costs. Their increase makes sense given that sales volume was increasing. As the food hub continues to grow its wholesale program, it will need to pay close attention to variable costs. Because working with larger customers will involve accepting a lower gross margin, by necessity it must also involve lower variable costs per sales dollar than the direct-to-consumer program.

Food Hub 2 ended the study period with high net income for a food hub (5.6%), 40% annual growth, a growing staff of enthusiastic, full-time individuals, and much lower labor costs than at the beginning of the study. While it had struggled with profitability and solvency, it appeared to be in a good position for continued growth.

Notes on adjustments for Case 2: For a food hub operating on a cash basis, we would ordinarily make accrual adjustments so that revenue, expenses and net income reflect business activities that were actually conducted in each fiscal year. However, no accrual adjustments were made to this hub's income statements, because during the years when the food hub was operating on a cash basis (2011 through most of 2014), the food hub lacked consistent year-end records of inventory, Accounts Payable or Accounts Receivable. The food hub switched to accrual accounting during 2014.

Depreciation, which accounted for a large portion of expenses in some years, was adjusted to reflect the straight-line method. These adjustments noticeably impacted the data from the income statements as well as the balance sheets. In the adjustments we also removed a grant that was listed as a current liability in 2014, so that it would not have a negative effect on the hub's financial position. With the adjustment, the grant funds appear similar to owner-contributed capital and add to the food hub's equity.

4.2.3 Overview of Case 3

Food Hub 3 is a non-profit organization that operates several different food-related programs. Like Food Hubs 1 and 2, it has a wholesale program and a direct-to-consumer retail food box program. These aggregate and deliver a variety of products to customers, including fresh produce and shelf-stable value-added items. The organization also conducts other activities beyond its food hub functions.

At the recommendation of the managers, we tried to focus our analysis only on the wholesale and direct-to-consumer food box parts of the business, because they were the activities that most resembled the activities of the other food hubs in our study. Wherever possible we calculated metrics using income and expense data solely from those two programs. Making things easier, the food hub tracked expenses and income separately for each of its programs in the last two years of the study. However, infrastructure used for food hub activities was shared with other programs, so it was sometimes difficult to determine which assets and expenses belonged to the food hub component of the organization.

Unlike the other hubs in our study, this food hub uses a brokerage model for the wholesale portion of its activities. It does not take ownership of products, but rather charges a fixed percentage brokerage fee, which is added to the price offered by farmers. For the retail food box program, it purchases products outright and packs them at its rented facility. For the most part, the food hub does its own delivery, using a truck that it also rents.

A financial summary and key metrics calculated for Food Hub 3 are shown in Tables 14 and 15. Note that because we only had two years of financial statements in which income statements were broken down by program, we could only show two years of data in the financial summaries. Also, because a program-by-program breakdown of expenses was available for this

Table 14: Financial Summary for Food Hub 3**Business size**

	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Business Revenue (including pass-through)	\$ 1,635,931.93	\$ 2,063,619.31	\$ 2,259,115.09
% Gross Revenue Growth from Previous Year	55%	26%	9%
Average Total Assets	\$ 141,551.52	\$ 364,566.33	\$ 491,133.69
Average Total Equity	\$ 36,970.09	\$ 193,385.18	\$ 229,227.61
Number of FTE	Not available	8.2	9.9

Note: 2012 is not included in the summaries below because total operating costs were not yet being allocated to the organization's individual programs in 2012.

RETAIL PROGRAM: Abbreviated Profit & Loss (no grant revenue included)

	Retail Benchmark (Troy 2014)	Food Hub Benchmark	Your Hub: 2013	Your Hub: 2014
Gross Revenue (Sales & Member Fees)	100.0%	100.0%	100.0%	100.0%
- Cost of Goods	75.4%	72.0%	64.7%	60.6%
= Gross Margin	24.6%	28.1%	35.3%	39.4%
- Operating Expenses	21.8%	26.3%	34.5%	42.1%
= Net Margin	2.8%	1.8%	0.8%	-2.7%

WHOLESALE PROGRAM: Abbreviated Profit & Loss (no grant revenue included)

	Wholesale Benchmark (Troy 2014)	Food Hub Benchmark	Your Hub: 2013	Your Hub: 2014
Gross Revenue (Sales & Fees including pass-through)	100.0%	100.0%	100.0%	100.0%
- Pass-through to farmers	83.7%	72.0%	81.9%	80.6%
= Commission & Brokerage Fees	16.3%	28.1%	18.1%	19.4%
- Operating Expenses	13.2%	26.3%	17.2%	19.6%
= Net Margin	3.1%	1.8%	1.0%	-0.3%

OVERALL FOOD HUB: Abbreviated Profit & Loss (no grant revenue included)

	Wholesale Benchmark (Troy 2014)	Retail Benchmark (Troy 2014)	Food Hub Benchmark	Your Hub: 2013	Your Hub: 2014
Total Gross Revenue	100.0%	100.0%	100.0%	100.0%	100.0%
- Cost of Goods and pass-through to farmers	83.7%	75.4%	72.0%	76.3%	75.2%
= Gross Margin	16.3%	24.6%	28.1%	23.7%	24.8%
- Operating Expenses	13.2%	21.8%	26.3%	22.7%	25.0%
= Net Margin	3.1%	2.8%	1.8%	1.1%	-0.2%

Table 14: Financial Summary for Food Hub 3 (continued)

Sources of Program Income - % of total*

	Food Hub Benchmarking Study 2014	Case Study Hub: 2013	Case Study Hub: 2014
Net Product Sales (<i>gross margin from retail</i>)	89.0%	26.2%	25.2%
Delivery / Brokering Fees (<i>incl. commission from wholesale</i>)	0.6%	69.3%	71.4%
Grants & Contributions	6.1%	2.6%	1.9%
Membership Fees	0.6%	1.9%	1.4%
Other Enterprise Income	2.6%	0.0%	0.1%
Misc. Income	1.1%	0.0%	0.0%
Total	100.0%	100.0%	100.0%

*breakdown of revenue types is drawn from the Food Hub Benchmarking Study.

Expenses - % of gross revenue**

Note: Grant and charitable income is not reflected in this table

	Wholesale Benchmark: (Troy 2014)	Retail Benchmark: (Troy 2014)	Food Hub Benchmarking Study 2014	Case Study Hub: 2013	Case Study Hub: 2014
"Cost of Goods Sold" (includes pass-through)				76.3%	75.2%
Advertising and marketing		0.1%		0.0%	0.0%
Bank Service Charges				0.4%	0.6%
Consulting Services				0.0%	0.0%
Data and Computer Services				0.4%	0.3%
Depreciation		0.3%		0.0%	0.4%
Facility Rental				1.5%	1.6%
Other facility expense				0.1%	0.2%
Insurance (non-vehicle)				0.0%	0.0%
Interest and Amortization		0.4%		0.0%	0.0%
Labor and Employment Costs		3.6%	18.3%	14.0%	15.8%
Packaging Equipment and Supplies				0.5%	0.3%
Shipping and Delivery (3rd party)				0.0%	0.0%
Truck expenses (rent, maintenance, repairs, fuel)				4.8%	5.2%
Utilities				0.0%	0.1%
Taxes		0.7%		0.0%	0.0%
Other expenses				1.0%	0.4%
TOTAL EXPENSES (% of revenue)				98.9%	100.2%
NET INCOME (% of revenue)				1.1%	-0.2%
				100.0%	100.0%

Table 15: Key Metrics for Food Hub 3

Measures in blue are based on year-end rather than average data, in cases where data was not available from the previous year.

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)		Metrics for hub			Metrics for Hub 3 if grants are included in total revenue		
					2012	2013	2014	2012	2013	2014
CASH FLOW & LIQUIDITY	Days Receivable	(Avg Accounts Receivable / Total Annual Sales) x days in fiscal year	Broadline Wholesale	22.0	Not available	Not available	2.7	No difference when grants are included in revenue		
			Produce Wholesale	30.0						
			Food Hub	Recommended <45 days						
	Days in Inventory	(Avg inventory / Annual COGS) x days in fiscal year	Broadline Wholesale	11.3	Not available	Not available	1.4	No difference when grants are included in revenue		
			Produce Wholesale	6						
			Conventional Retail Grocer	29.2						
	Days Payable Outstanding	(Avg Accounts Payable / Annual COGS) x days in fiscal year	Produce Wholesale	47.8	Not available	Not available	1.0	No difference when grants are included in revenue		
			Food Hub	Recommended <30 days						
	Current Ratio	Total current assets / total current liabilities	Broadline Wholesale	1.7	Not available	Not available	2.1	No difference when grants are included in revenue		
			Conventional Retail Grocer	3.8						
			Cooperative Retail Grocer	3.34						
			Food Hub	2.39						
EFFICIENCY	Labor to Sales Ratio	Total personnel expenses / total sales	Broadline Wholesale	3.00%	Not available	14.1%	17.3%	No difference when grants are included in revenue		
			Conventional Retail Grocer	6.30%						
			Cooperative Retail Grocer	22.86						
			Food Hub	18.30%						
	Labor to Income Ratio	Total personnel expenses / total revenue	Food Hub	16.40%				Not available	13.9%	15.7%
	Sales per Worker Equivalent	Total Sales / Average FTE	Food Hub	\$387,204.00	Not available	\$249,744	\$225,896			
Revenue Per Worker Equivalent	Total Revenue / Average FTE	Food Hub	\$431,872.00				Not available	\$253,178	\$228,472	
Asset Turnover ratio	Gross revenue / average assets	Broadline Wholesale	5.4	Not available	Not available	Not available				
		Conventional Retail Grocer	5.8							
		Cooperative Retail Grocer	4.3							

Table 15: Key Metrics for Food Hub 3 (continued)

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)		Metrics for hub			Metrics for Hub 3 if grants are included in total revenue				
					2012	2013	2014	2012	2013	2014		
PROFITABILITY	Gross Margin before Costs of Sales (%)	(Gross Revenue - COGS) / Gross Revenue	Broadline Wholesale	16.3%	Wholesale: 16.4%	18.1%	19.4%					
			Cooperative Retail Grocer	36.0%				Retail: 29.7%	35.3%	39.4%		
			Food Hub	28.1%				Overall: 20.5%	23.7%	24.8%	Not available	24.2%
	Operating profit margin (%)	(Net income + Interest + Taxes) / Gross Revenue	Broadline Wholesale	2.70%	Not available	1.1%	-0.2%	Not available	1.7%	0.3%		
			Conventional Retail Grocer	2.40%								
			Cooperative Retail Grocer	0.98%								
	Return on Assets (%)	Return on assets (\$) / total assets, where Return on Assets (\$) = net income + interest	Broadline Wholesale	18.90%	Not available	Not available	Not available	Not available	9.6%	1.3%		
			Conventional Retail Grocer	24.20%								
			Cooperative Retail Grocer	8.44%								
SOLVENCY & REPAYMENT CAPACITY	Debt Service Coverage Ratio	EBITDA / scheduled principal and interest payments for year, where EBITDA = net income + interest + taxes + depreciation + amortization	Food Hub	Recommended above 1.1-1.5	n/a (no loans)	n/a	n/a					
	Debt to Assets (%)	Total liabilities / total assets	Broadline Wholesale	84.70%	73.9%	47.0%	53.3%	No difference when grants are included in revenue				
			Conventional Retail Grocer	55.70%								
			Cooperative Retail Grocer	59.33%								
Food Hub	32%											

Color key for sources of benchmark data

Type of business benchmarked	Citation
Broadline Wholesale	Troy, 2013
Conventional Retail Grocer	Troy, 2014
Cooperative Retail Grocer	NCG, 2006
Food Hub (Actual Data)	NGFN Food Hub Collaboration, 2014
Food Hub (Recommendations)	Vanderburgh-Wertz & Ram Moraghan, 2014; K. Danaher, personal communication, Dec., 4, 2015
Produce Wholesale	First Research, 2015
Produce Wholesale	UFPA, 2014

food hub, we added separate summaries of the wholesale and retail programs to our standard financial summary template.

As seen in the financial summary, Food Hub 3 grew its sales by 55% in 2012 and by 26% in 2013, 2013, but only grew 9% in 2014. Staff FTE did increase during this time, however, and so did operating costs, which contributed to negative profit in 2014. The relative contributions of the food box and wholesale programs to total sales did not vary greatly over the three years. If food-box food costs are not counted as part of wholesale sales, then wholesale comprised 84%, 80%, and 83% of food hub business income in 2012, 2013, and 2014, respectively. Retail (food box) sales comprised the remainder of sales.

Individually, both the wholesale and the food box programs saw positive profits in 2013 and small losses in 2014, not counting grant revenue. The total food hub activities (combining wholesale and food box sales) also produced small positive profits in 2013 (1.8%) and small losses in 2014 (-0.2%), again not counting grant revenue. If grant funding is considered, the food hub saw a positive profit from the two combined operations in both years. However, charitable funding comprised only a small portion of the total income for the two programs, 1.9-2.6%. This is less charitable funding than the “average” food hub used in the Food Hub Benchmarking Study.

A breakdown of the food hub’s top five expenses is shown in Table 16. The top three operating costs similar same in both years. Increases in labor costs (as seen also in the increased Labor to Sales Ratio) may have been the main contributor to the net loss in 2014. This may have been linked to a mission-driven effort by the food hub to move away from contracted labor and towards employee labor. The depreciation allocated to the wholesale and retail programs also

Table 16: Food Hub 3: Top 5 Expense Categories, Largest to Smallest

2013	% of total operating expenses	Expense
Labor and Employment Costs	61.5%	\$287,983.04
Truck expenses (rent, repairs, fuel, insurance)	21.1%	\$98,823.51
Facility Rental	6.6%	\$30,891.00
Production supplies	2.2%	\$10,174.10
Data and Computer Services	2.0%	\$9,282.81

2014	% of total operating expenses	Expense
Labor and Employment Costs	63.0%	\$355,903.36
Truck expenses (rent, maintenance, repairs, fuel)	20.9%	\$117,882.12
Facility Rental	6.4%	\$36,318.00
Bank Service Charges	2.5%	\$14,097.32
Depreciation (<i>adjusted</i>)	1.6%	\$9,260.28

increased in 2014 as the food hub made investments in new equipment. These cost increases occurred even with the slow sales growth from 2013 to 2014. As we will see, this food hub could probably look at ways to increase its staff's efficiency at generating sales, but its total operating costs were not unreasonable for a business that generates most of its revenue through wholesale. Like most food hubs, the nonprofit Food Hub 3 articulated a strong values-based commitment to the mission of serving farmers and of making local food more widely available to customers. Managers were not explicitly interested in making a profit, but said they sought to cover programmatic costs and some of the overhead shared with other initiatives. Taken together, the financial performance of the wholesale and food box programs seems consistent with the managers' stated objectives. If the food hub's sales growth continues to be small relative to its prior growth rate, the next challenge may be adjusting to this new phase of slower growth and/or finding new ways to expand.

This food hub showed a reasonably strong financial position overall. It compared well to its peers in terms of low operating costs, low staffing costs, good liquidity and a good solvency position. Not taking ownership of wholesale product means that the food hub faces few risks from product shrinkage and does not have its cash tied up in unsold inventory. Products flowing through the hub do not belong to the food hub and are usually already sold by the time they arrive. The smaller retail program complements the wholesale model by providing prepaid sales, which are also good for cash flow and for expanding the food hub's marketing presence in the community.

This food hub's business model illustrates how bundling multiple sets of services together may make it possible to do "more with less." The food hub's wholesale and retail programs may have benefitted from sharing administration, management and other overhead with other enterprises owned by the same firm. These functions may have been performed more efficiently because they were being performed at a larger scale than if they only existed for the wholesale and retail portions of the business. The business probably also benefitted from economies of scope in which its various marketing and sales activities complemented one another. It is worth noting that although Food Hub 3 was not the oldest hub in our study, it had by far the largest annual sales revenue, over \$2.2 million. It had been able to build a substantial customer base in a relatively short span of time. The diversity of Food Hub 3's set of services, each of which targeted a slightly different clientele, probably contributed to this by raising its overall profile and visibility.

Food Hub 3 also set a strong example with the setup of its financial statements. Because the organization sought to measure the net income (or losses) from each of its many programs, it separated its programs into different accounting classes in Quickbooks™. This made it easier to

compare operating expenses between the wholesale and retail programs and to see how each program was contributing to overall profit.

Notes on Adjustments and Calculations for Case 3: As noted, this food hub never allocated assets or liabilities on its balance sheet among programs. As a result, we could not calculate any metrics solely for two food hub programs in 2012, but we did calculate metrics for 2013 and 2014. Metrics that depended on balance sheet data could not be calculated exclusively for the two food hub programs. However, we could (and did) calculate them using balance sheet data for the whole business.

Days Payable and Days Receivable could only be calculated for the end of 2014, the year when the organization began to track receivables. For an outsider, these metrics were difficult to interpret for Food Hub 3 because the Accounts Receivable and Accounts Payable on the balance sheet were for all parts of the business, not just the retail food box and wholesale programs. Also, wholesale Receivables were being uploaded to Quickbooks™ from sales software, so it wasn't clear whether the receivables in Quickbooks™ were accurate or up-to-date at a given point in time. In an effort to measure only receivables from relevant business transactions, some receivables that were clearly not from wholesale or food box customers were removed from the Days Receivable calculation.

There may have been some relevant staffing, marketing and administrative costs that didn't appear in our analysis because they were allocated to the other enterprises (other P&L classes in Quickbooks™) that were outside of our analysis. For example, no accounting or general liability insurance expenses were allocated to the wholesale and retail programs of the food hub. In reality, the food hub was probably sharing some accounting and insurance costs

with other programs. If this is true, then the actual operating costs would be higher than what is reflected in our analysis.

Food Hub 3 also required special consideration because it operates partly on a brokerage basis, without taking ownership of product, and is therefore difficult to compare to businesses that do take ownership. In our analysis, we adjusted the food hub's figures to reflect what the food hub's income statements and metrics *would* look like if the hub were taking ownership. That is to say, total wholesale sales (including the portion that passes through to farmers) were treated as gross revenue, and pass-through to farmers was treated as Cost of Goods Sold (COGS). Gross margins for the wholesale program and for the overall business were calculated using this information, and so were the other metrics like the Labor to Sales Ratio. This made it possible to see how Food Hub 3 compares to food hubs in the Food Hub Benchmarking Study, and to other businesses that do not use a brokerage model.

The standard set of adjustments presented in Chapter 3 were also applied. These included making adjustments for straight line depreciation, and moving the cost of box materials from Costs of Goods Sold into the operating expenses.

4.2.4 Overview of Case 4

Food Hub 4 is a cooperative that sells a varied product line of produce, meats, dairy, and frozen goods to exclusively wholesale outlets. It does not operate any direct-to-consumer retail programs. Some unique aspects of this food hub's business model cause its expenses to look different from those of the other hubs in the study. It relies on partners for the majority of its hauling and owns no trucks. Partly as a result, its customer base is highly concentrated, meaning

that it does not have many direct customers. It also rents its facility, so overall its freight and infrastructure costs are relatively low. It is the youngest of the food hubs in our case study.

Tables 17 and 18 show a financial summary and key metrics for Food Hub 4. It experienced very rapid growth in 2012-2014, with a sales increase of 101% (or about \$210,000 in additional sales) in 2014. However, as a relatively new business, its total revenue (\$424,000 in 2014) remained very small compared to that of other firms in our case study. The food hub also experienced very narrow gross margins, which made finances challenging. This is partly explained, but not fully explained, by the fact that the food hub was competing in the landscape of wholesale prices and relying on partners to do the actual distribution of its products. The margins used by the hub were well below the benchmarks for broadline wholesale.

The food hub was able to subsidize its growth during its startup period with charitable funding; in any given year, 11-16% of revenues came from grants, and most of the remainder came from sales. The business also generated small revenues from other sources such as membership fees, rent, and interest. Still, the business faced large negative profits each year during 2012-2014. In the metrics, this is shown to be true even if grant income is considered to be revenue.

Food Hub 4 was capitalized by a combination of investor equity, grants and (to a lesser extent) co-op member equity. All of the business' equity was owned by investors and co-op members. Because it never made a profit, it had no retained earnings or unallocated member equity. Shareholder and member equity served to buffer each year's losses. Although the hub did not make a profit, a dividend was still paid in each year. (Note: in our calculations we counted the dividends as a deduction from net income and did not consider them to be expenses.)

Table 17: Financial Summary for Food Hub 4

Business size

	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Business Revenue	\$ 134,406.27	\$ 211,168.68	\$ 424,265.23
% Growth from Previous Year	236%	57%	101%
Average Total Assets	\$ 57,164.92	\$ 71,380.00	\$ 112,596.90
Average Total Equity	\$ 50,205.57	\$ 43,059.30	\$ 23,769.61
Number of FTE	1.3	1.3	2.5

Abbreviated Profit & Loss (no grant revenue included)

Note: Grant and charitable income is not reflected in this table

	Wholesale Benchmark (Troy 2014)	Retail Benchmark (Troy 2014)	Food Hub Benchmarking Study 2014	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost of Goods	83.7%	75.4%	72.0%	93.0%	89.7%	89.0%
Gross Margin before Costs of Sales	16.3%	24.6%	28.1%	7.0%	10.3%	11.0%
Operating Expenses	13.2%	21.8%	26.3%	74.6%	48.4%	50.7%
Net Margin	3.1%	2.8%	1.8%	-67.6%	-38.1%	-39.7%

Sources of Revenue - % of total revenue*

	Wholesale Benchmark (Troy 2014)	Retail Benchmark (Troy 2014)	Food Hub Benchmarking Study 2014	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Net Product Sales			89.0%	87.6%	82.8%	85.1%
Delivery / Brokering Fees			0.6%	0.0%	0.0%	0.0%
Grants & Contributions			6.1%	11.9%	15.9%	11.8%
Membership Fees			0.6%	0.3%	1.2%	2.0%
Other Enterprise Income			2.6%	0.3%	0.0%	0.2%
Misc. Income			1.1%	0.0%	0.1%	0.7%
Total			100.0%	100.0%	100.0%	100.0%

*breakdown of revenue types is drawn from the Food Hub Benchmarking Study.

Expenses - % of total revenue

Note: Grant and charitable income is not reflected in this table

	Wholesale Benchmark: (Troy 2014)	Retail Benchmark: (Troy 2014)	Food Hub Benchmarking Study 2014	Case Study Hub: 2012	Case Study Hub: 2013	Case Study Hub: 2014
Cost of Goods Sold	75.2%	73.4%	72.0%	93.0%	89.7%	89.0%
Advertising and promotional materials	0.1%	0.3%		9.0%	0.3%	1.7%
Bank Service Charges				0.1%	0.1%	0.1%
Consulting Services				3.0%	6.1%	16.6%
Data and Computer Services				0.1%	0.1%	0.3%
Depreciation (adjusted)	0.3%	0.5%		0.1%	0.1%	0.1%
Facility Rental				4.7%	3.4%	3.5%
Infrastructure repair and maintenance				0.0%	0.0%	0.0%
Insurance (non-vehicle)				7.9%	5.2%	2.9%
Interest and Amortization	0.4%	0.2%		0.0%	0.0%	0.5%
Labor and Employment Costs	3.6%	8.4%	18.3%	42.5%	27.3%	18.5%
Packaging Equipment and Supplies				0.0%	0.0%	0.0%
Shipping and Delivery (3rd party)				0.0%	2.5%	0.5%
Taxes	0.7%	1.3%		0.0%	0.0%	0.0%
Truck expenses (rent, maintenance, repairs, fuel)				0.0%	0.0%	0.0%
Utilities				1.1%	1.2%	0.8%
Other expenses				5.9%	2.0%	5.4%
TOTAL EXPENSES (% of revenue)				167.6%	138.1%	139.7%
Net Margin	3.1%	2.8%		-67.6%	-38.1%	-39.7%
TOTAL				100.0%	100.0%	100.0%

Table 18: Key Metrics for Food Hub 4

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)		Metrics for Hub 4 (no grants)			Metrics for Hub 4 if grants are included in total revenue		
					2012	2013	2014	2012	2013	2014
CASH FLOW & LIQUIDITY	Days Receivable	(Accounts Receivable / Total Annual Sales) x days in fiscal year	Broadline Wholesale	22.0	74.4	70.5	18.8	No difference when grants are included in revenue		
			Produce Wholesale	30.0						
			Food Hub	Recommended <45 days						
	Days in Inventory	(Average inventory / Annual COGS) x days in fiscal year	Broadline Wholesale	11.3	Not available	Not available	67.4	No difference when grants are included in revenue		
			Produce Wholesale	6						
			Conventional Retail Grocer	29.2						
	Days Payable Outstanding	(Accounts Payable / Total Annual Sales) x days in fiscal year	Produce Wholesale	47.8	16.3	10.5	64.2	No difference when grants are included in revenue		
			Food Hub	Recommended <45 days						
	Current Ratio	Total current assets / total current liabilities	Broadline Wholesale	1.7	8.1	1.2	1.3	No difference when grants are included in revenue		
			Conventional Retail Grocer	3.8						
			Cooperative Retail Grocer	3.34						
			Food Hub	2.39						
EFFICIENCY	Labor to Sales Ratio	Total personnel expenses / total sales	Broadline Wholesale	3.60%	42.8%	26.0%	19.2%			
			Conventional Retail Grocer	6.30%						
			Cooperative Retail Grocer	22.86						
			Food Hub	18.30%						
	Labor to Income Ratio	Total personnel expenses / total revenue	Food Hub	16.40%				37.5%	21.6%	16.4%
	Sales per Worker Equivalent	Total Sales / Average FTE	Food Hub	\$387,204.00	\$106,815	\$154,426	\$167,234			
	Revenue Per Worker Equivalent	Total Revenue / Average FTE	Food Hub	\$431,872.00				\$107,525.02	\$156,886.09	\$173,169.48
Asset Turnover ratio	Gross revenue / average assets	Broadline Wholesale	5.4	2.4	3.0	3.8	2.7	3.5	4.3	
		Conventional Retail Grocer	5.8							
		Cooperative Retail Grocer	4.3							

Table 18: Key Metrics for Food Hub 4 (continued)

Measure of...	Name of Measure	Calculation	Example benchmarks from other businesses (see color key below for sources)		Metrics for Hub 4 (no grants)			Metrics for Hub 4 if grants are included in total revenue					
					2012	2013	2014	2012	2013	2014			
PROFITABILITY	Gross Margin before Costs of Sales (%)	(Revenue - COGS) / Revenue (Note: Overall gross revenue reflects non-sales revenue such as member fees)	Broadline Wholesale	16.3%	Wholesale: 4.1%	8.8%	7.9%						
			Cooperative Retail Grocer	36.0%				Overall: 7.0%	10.3%	11.0%	18.0%	24.6%	21.5%
			Food Hub	28.1%									
	Operating profit margin (%)	(Net income + Interest + Taxes) / Gross Revenue	Broadline Wholesale	2.70%	-67.5%	-38.0%	-39.3%	-47.6%	-16.0%	-22.8%			
			Conventional Retail Grocer	2.40%									
			Cooperative Retail Grocer	0.98%									
	Return on Assets (%)	Return on assets (\$) / total assets, where Return on Assets (\$) = net income + interest	Broadline Wholesale	18.90%	-158.6%	-112.5%	-148.0%	-126.8%	-56.3%	-97.4%			
			Conventional Retail Grocer	24.20%									
			Cooperative Retail Grocer	8.44%									
SOLVENCY & REPAYMENT CAPACITY	Debt Service Coverage Ratio	EBITDA / scheduled principal and interest payments for year, where EBITDA = net income + interest + taxes + depreciation + amortization	Food Hub	Recommended above 1.1-1.5	-503.6	-320.6	-85.8	-402.8	-160.6	-56.5			
	Debt to Assets (%)	Total liabilities / total assets	Broadline Wholesale	84.70%	12.2%	39.7%	78.9%	No difference when grants are included in revenue					
			Conventional Retail Grocer	55.70%									
			Cooperative Retail Grocer	59.33%									
			Food Hub	32%									

Color key for sources of benchmark data

Type of business benchmarked	Citation
Broadline Wholesale	Troy, 2013
Conventional Retail Grocer	Troy, 2014
Cooperative Retail Grocer	NCG, 2006
Food Hub (Actual Data)	NGFN Food Hub Collaboration, 2014
Food Hub (Recommendations)	Vanderburgh-Wertz & Ram Moraghan, 2014; K. Danaher, personal communication, Dec., 4, 2015
Produce Wholesale	First Research, 2015
Produce Wholesale	UFPA, 2014

After several unprofitable years the food hub became insolvent, and it was facing liquidity problems by the end of 2014.

Financial statements were well-organized and included important basic information that our other cases failed to track, including Accounts Payable, Accounts Receivable, Inventory, and line items for shrink and for quality-related customer credits. All statements were on an accrual basis. This made it easier to analyze the data than for some of our other cases.

A breakdown of the food hub's top five operating expenses is shown in Table 19.

Table 19: Food Hub 4: Top 5 Operating Expense Categories, Largest to Smallest

2012	% of total operating expenses	Expense
Labor and Employment Costs	57.0%	\$57,172.93
Advertising and marketing	12.1%	\$12,129.29
Insurance	10.6%	\$10,645.79
Facility Rental	6.3%	\$6,300.00
Printing & Reproduction	4.4%	\$4,413.89

2013	% of total operating expenses	Expense
Labor and Employment Costs	59.5%	\$57,641.41
Professional Services	13.2%	\$12,795.95
Insurance	11.4%	\$11,026.75
Facility Rental	7.4%	\$7,200.00
Freight	5.2%	\$5,303.50

2014	% of total operating expenses	Expense
Labor and Employment Costs	36.9%	\$78,686.46
Professional Services	33.0%	\$70,290.88
Insurance	5.7%	\$12,132.32
Facility Rental	4.3%	\$9,150.00
Advertising and Marketing	3.4%	\$7,166.04

As with the other case study hubs, staffing was the largest expense for Food Hub 4. All of its labor was hourly and there was a cap on the number of paid hours per staff person per

week. The hub showed a steady proportional decrease in its labor expenses (as seen in the Labor to Sales Ratio) during the study period. Because it did not have many variable costs other than hourly labor and COGS, the largest cost categories were primarily overhead costs, with the exception of freight in 2013. Several of the larger expenses, including Advertising and Marketing, Printing and Reproduction, and some of the Professional Services, were probably for grant-funded promotional startup activities. These investments make sense in a new business' early years. Insurance costs were large for a food hub of this size, but evidently a \$10 million insurance policy was required for dealing with one particular customer.

Dividends were not considered to be an expense in our calculation of Operating Profit Margin, operating expenses or net margin; as noted we considered dividends to be part of net income. Net income was always negative, though. Clearly, paying out dividends in unprofitable years affected both the organization's cash flow and its long-term reserves. It also further eroded the equity held by members. One could even say that the dividends received by shareholders were being subsidized by the equity contributed by members. Our interviews indicated that the co-op paid a 5% dividend to holders of preferred stock each year or rolled the dividend over into additional stock. One question raised by our reviewers was whether the co-op could take the roll-over option, rather than paying out a dividend, in order to boost cash flow.

Notes on adjustments for Case 4: No accrual adjustments were made to Food Hub 4's financial statements because the statements were already on an accrual basis. Depreciation adjustments were not needed because depreciation was a negligible cost for this hub. The only adjustment we made for Food Hub 4 was to remove freight costs from Costs of Goods Sold and add them to operating costs, because all of the freight costs were for outbound freight (i.e. delivery to customers), according to managers. In our analyses we consider outbound freight to

be a Cost of Sales, not a Cost of Goods Sold. If the food hub had inbound freight expenses, we would treat them as a Cost of Goods Sold.

We have shared an overview of the four food hubs that were part of our comparative study, and how their data were manipulated for analysis. Next we will provide a more systematic summary of the results.

4.3 Key Metrics: Discussion of Results Across Case Studies

In our initial research questions for the comparative case study, we asked: how can a set of financial metrics be used to evaluate the performance of a particular food hub and to direct managerial decision-making in the future? In this section we apply our dashboard of key metrics from Chapter 3 to the four case study hubs and interpret the results. As in the dashboard of metrics, our analysis is organized into four sub-sections: “cash flow and liquidity,” “efficiency,” “profitability,” and “repayment capacity and solvency.”

4.3.1 Cash Flow and Liquidity Metrics

In this section, we consider metrics related to cash flow, or the amount of money available to pay bills, and liquidity, or the ability of the business to pay current debts without liquidating long-term assets. Metrics related to cash flow include Days Receivable (DR: average number of days that receivables are outstanding), Days in Inventory (DI: the average number of days that items stay in inventory) and Days Payable Outstanding (DPO: the average number of days that payables are outstanding). DR, DI and DPO together make up the Cash Conversion

Cycle (CCC), which measures how long it takes to convert the cost of goods purchased from farmers (Costs of Goods Sold) into cash from sales. The CCC can be calculated as follows:

$$DR + DI - DPO = CCC$$

The shorter the Cash Conversion Cycle, the more cash the food hub will have available to finance the costs of its own growth. A short CCC means that cash flow is keeping pace with the sales growth of the business, rather than lagging behind. This increases the food hub's ability to self-finance its growth using its own cash, at zero interest. Due to limited information we could not calculate the Cash Conversion Cycle for most of the case study hubs in most years.

However, the individual components of the cycle, and especially the relationship between Accounts Payable and Receivable, still say a great deal about cash flow.

To measure liquidity in general, we use the Current Ratio, which shows the degree to which the food hub can cover its short-term debt and other short-term liabilities without selling off its fixed assets.

Days Receivable: Some food hubs were using cash accounting (as opposed to accrual accounting) at the beginning of the study period, and Accounts Receivable were not recorded consistently by food hubs in those years, so Days Receivable measures could not be calculated for all hubs in all years. However, we did have at least one year of receivables data from all four of the hubs.

Food Hub 1 showed Days Receivable ranging between 12 and 16 days. These were lower than the benchmarks of 22 days for broadline wholesalers and 30 days for produce wholesalers, indicating that the food hub collected Accounts Receivable from customers more quickly than other businesses. Nonetheless, Food Hub 1's average 2013 receivables (\$59,637)

equaled a full 50.3% of its average total assets (\$118,528). This means that half the food hub's assets were essentially tied up in no-interest loans to customers. By way of comparison, the average broadline distributor in the Almanac of Business and Financial Ratios had receivables that were about 33% of total assets (Troy, 2013). Receivables constituted a large portion of assets for the other food hubs as well.

Because **Food Hub 2** did not have a consistent system for tracking Accounts Receivable during 2012-2014, we were only able to calculate this measure for the end of 2014, using annual sales from 2014. The result is a crude measure, but still interesting: on average the hub was paid 6.6 days after food was delivered. The food hub's figure was probably so low because of its prepaid food box program, in which many consumers paid for products long before they were delivered.

The bad news not evident in Food Hub 2's Days Receivable is that, in 2013 and 2014, they experienced significant problems collecting customer payments. The problem was especially noticeable in the retail food box program, to the point that the hub had to "write off" (treat as a loss) a significant portion of its aged receivables. Write-offs totaled \$29,160 in 2013, or 3% of sales. Viewed as an expense, write-offs were higher than the food hubs's total vehicle expenses in that year. Because the food hub still incurred Costs of Goods Sold for products that customers never paid for, these write-offs cut directly into the hub's profits. If the written-off bills had been collected, the food hub's profit in 2013 would have been 3% higher, transforming its net income from negative to profit for that year. The hub's managers attributed the problem of write-offs to its system of collecting personal checks for seasonal food box shares, sometimes on an installment basis. Managers reported that after 2013 the hub started tracking payments more closely and accepting more online payment, and in 2014 the write-offs decreased.

However, it then had to pay credit card processing fees of more than 2% on its customer transactions, illustrating a tradeoff between accepting instant payment with credit cards or accepting delayed payment with checks.

For **Food Hub 3**, the Days Receivable figure for the end of 2014 (2.7 days) was quite short compared with the benchmarks. There are several plausible reasons for this. First, the low Days Receivable would be consistent with Food Hub 3's ongoing efforts to collect receivables more quickly, which one of the food hub managers described in interviews. Second, it probably reflects the fact that 16-19% of sales came from prepaid food box deliveries, which typically add a zero or very low balance to Accounts Receivable. Third, it may reflect aspects of the brokerage model, which does not require the food hub to purchase farmers' products outright. Either way, the organization's practices for collecting payment appeared to be good for cash flow.

Since **Food Hub 4** only sells wholesale, it seems appropriate to compare it to the Broadline Wholesale and Produce Wholesale benchmarks. Days Receivable for Food Hub 4 were very long compared to the benchmarks in 2012 and 2013 (70.5-74.4 days), but less than the benchmarks in 2014 (18.8 days). This suggests that in 2014 Food Hub 4 may have altered its billing terms and collection practices to increase cash flow. (Towards the end of 2014 the food hub had spent all its equity and suffered from low working capital, as we will see). Even in 2014 managers may have had reason to improve bill collection practices, though. Based on a list of Accounts Receivable, the food hub's largest customer was taking 30-90 days or more to pay some of its bills. If this was a regular pattern, and especially if it violated payment terms, it needed to be addressed with the customer.

One useful practice employed by both Food Hubs 1 and 2 was to separate Accounts Receivable into subaccounts – including one for the retail program and one for the wholesale program. This approach, mentioned by Food Hub 2’s accountant in our interviews, probably helped with setting and meeting targets for recovering receivables in each program. Each business could then focus on shortening customer payment terms in the wholesale department (without “Days Receivable” being skewed by the prepaid boxes), and could work on eliminating aged payables for the prepaid food boxes. For both food hubs, Days Receivable seemed to be drastically shorter for retail food box programs than for wholesale. It is difficult to say whether this was generally true or seasonally dependent, since food box prepayments were only collected at certain times of year. If it were generally true, then we would conclude that retail customers paid the food hubs much faster than wholesale customers.

It seems intuitive that prepaid programs would shorten overall Days Receivable. However, an important point to notice is that Days Receivable only reflects the time between billing and payment. It does not reflect the separation in time between when products are billed and when they are delivered. Since most food box prepayments were received well in advance of product delivery, they acted as a source of early-season cash, which could then be drawn down over time to pay for expenses. Cash flow statements would show this, but not necessarily Days Receivable. When first switching to accrual accounting, Food Hub 2 recorded food box payments as “negative receivables,” which literally subtracted from overall Days Receivable and made the cash flow benefits of food boxes obvious. This method is awkward for recordkeeping, however, and after the first year, Food Hub 2 began simply recording food box prepayments as cash assets, similarly to Food Hub 1. We would expect some of the cash flow benefits of food box programs to show up in the Current Ratio, but they are difficult to see in our metrics.

Overall, we can observe that for the food hub that offered only wholesale, Days Receivable in the first two years were noticeably longer than in the benchmarks. For the food hubs that had a retail component, Days Receivable were much shorter. For the food hub that brokered most of its products, Days Payable and Receivable were both very short and probably less important for cash flow, because the hub was not taking ownership of the products.

Finally, the example of Food Hub 2 reveals that aged receivables can be a major problem for profitability. Conversations with other hubs have confirmed this. In fact, on the National Good Food Network's Food Hub Community of Practice listserv, one large hub reported an average of 35-45% receivables past due and about 1-1.5% write-offs. Not all hubs can afford to extend this kind of credit or suffer this much loss.

Days Payable Outstanding: This measure also varied greatly and, like Days Receivable, could not be calculated in every year for all four food hubs. However, we did receive at least one year of Accounts Payable data from each hub.

Days Payable for **Food Hub 1** were shorter than 30 days, but were consistently longer than Days Receivable, suggesting that its managers might have been using different payment terms on Accounts Payable and Receivable to generate cash. Keeping receivables terms shorter than payment terms is a good practice for increasing cash flow, if cash is limited.

Food Hub 2 only provided year-end payables data for 2014. Based on this limited information, they appeared to be using a similar strategy to Food Hub 1, maintaining Days Receivable shorter than Days Payable. In its early years managers said they usually paid its farmers and suppliers immediately, but in late 2013 they changed their policy to improve cash flow. By the end of 2014, the firm took an average of 25 days to pay its bills.

Days Payable for **Food Hub 3** at the end of 2014 (1.0 days) were extremely low, assuming their recorded Accounts Payable really did reflect the full value of payables. This would indicate that the food hub was paying its producers very quickly, almost immediately after receiving products. Such a practice has many benefits for producers, and might be more feasible for a food hub using a brokerage model that sells products before they are ever brought to the food hub. Having low Days Receivable and a cash cushion from unspent grant funds may have made it easier for Food Hub 3 to pay farmers quickly without experiencing a cash shortage.

Food Hub 4 paid its producers quickly in 2012 and 2013. It only showed Days Payable longer than Days Receivable in 2014, when other problems with the business probably created a need for cash flow. The choice to wait longer to pay farmers may have been a response to a severe reduction in working capital, which resulted from negative profits over time, and limited cash, a result of holding large amounts of inventory. (Notably, however, having larger payables than receivables reduces working capital in itself.) The food hub may have been forced to extract more credit from its producers in order to cash flow its basic operations in 2014, or producers may have extended the additional credit voluntarily.

In general, December Days Payable did not average more than 30 days for any of the hubs except in the last year of Food Hub 4's records. Given that United Fresh produce wholesalers report a Days Payable Outstanding of 47.8 days, conventional wisdom might suggest that everyone could lengthen their payment terms more. It is likely that food hubs make a deliberate choice not to do so because of their values-based commitment to supporting farmers.

Days in Inventory: Data on inventory was limited, but when measurable, Days in Inventory varied greatly according to business model. Data to calculate Days in Inventory was available in at least one year from Food Hubs 1, 3 and 4.

For Food Hub 1, which turned over most of its fresh products immediately but stored some over the winter, Days in Inventory were moderate and in the range of the benchmarks, between 7 and 12 days. Food hub managers told us they held a larger amount of shelf-stable inventory in the winter than in the spring and summer. If we had financial statements from the summer we might expect them to show faster inventory turns.

For Food Hub 3, which brokered most of its products and purchased a relatively small quantity of products for its retail program, Days in Inventory were very short at 1.4 days. Food Hub 3 recorded inventory on the balance sheet for the wholesale program only. This food hub's "inventory" operated differently from inventory in a company that takes ownership of product. The value of inventory seemed to have been recorded in terms of sale price (i.e. gross revenue), rather than COGS, so we took the unusual step of calculating Days in Inventory as:

$$365 \text{ Days} \times \text{Inventory} \div \text{Total Annual Sales}$$

This metric should be numerically equivalent to typical Days Receivable. The result shows that, if inventory held by the business at the end of December was typical, then wholesale items spent an average of 1.4 Days in Inventory before being sold. The low number probably reflects how pre-selling products leads to swift product turnover. (Technically, a business that does not take ownership of products should not record them as an inventory asset, so it might be more accurate to say that Days in Inventory was close to zero. We are not exactly sure why the food hub chose to record inventory for the wholesale program. Inventory for the food box

program, which the food hub did own, probably was not recorded because it turned over so quickly.)

Food Hub 4 began tracking inventory in Quickbooks™ in 2013, probably because it was paying rent on its frozen product storage. For this food hub, Days in Inventory (about 67 days) were much longer than industry benchmarks. Our interviews with staff suggest that turnover for fresh produce was very fast, usually within 24 hours. Therefore, the inventory appearing on the food hub's balance sheet was probably mostly frozen and value-added. Managers of Food Hub 4 told us that the hub's ultimate goal was for fresh produce to comprise only 30% of total revenues, with most of the remaining 70% coming from sales of frozen products. Obviously, keeping frozen inventory is a valuable part of the food hub's business model, spreading out revenues from harvest-season produce throughout the year. However, having such a large amount of Costs of Goods Sold tied up in inventory means that the food hub needs more working capital to operate. This food hub should consider making a cash flow budget and tracking the holding costs of its inventory, as will be discussed in Chapter 5. Long holding times for inventory may be partly responsible for the relatively large losses from shrink (spoilage) that the food hub reported.

None of the food hubs seemed to be using a sophisticated system (such as an ERP) for inventory functions; they were storing their inventory data in Quickbooks™. Only one case study hub was tracking inventory at the beginning of the three-year study period. By the end of the study period, three of the four were tracking inventory. These observations suggest that inventory management tends not to become a priority for food hubs until they start to mature.

Current Ratio: Like Days Receivable, Days Payable, and Days in Inventory, our Current Ratio calculations represent only a snapshot of each company based on December balance sheets. Current Ratios likely varied throughout the growing season in tandem with current liabilities such as Accounts Payable and current assets such as Accounts Receivable, cash and inventory. For example, current assets might be higher in months when food box prepayments are received. Nonetheless, the December Current Ratios provide enough information to identify working capital constraints for some of the food hubs. Furthermore, if food hubs were experiencing problems with liquidity in December, which is usually at the end of the busy season, then it seems even more likely that they were struggling in March, when food hub sales tend to be the lowest, or at the beginning of the summer, when rapid increases in sales sometimes put a strain on available cash.

For **Food Hub 1**, the average Current Ratio was <1 in the first two years, but >1 (although still low) in the third year. This suggests that on average, in its first two years, the food hub experienced negative working capital and may have had trouble meeting its payment obligations. Most likely, the hub survived its liquidity constraints by delaying payments to farmers and by obtaining new loans from co-op members, which appear on the balance sheets at the end of those years. The situation appears to have improved in 2013, when the average Current Ratio increased to 1.22. This figure is still low compared to the benchmarks. However, a low Current Ratio is more acceptable for a business like Food Hub 1 that makes frequent sales and sells its inventory reasonably quickly.

For **Food Hub 2**, this measure could only be calculated for the end of 2014, when the adjusted Current Ratio was 0.3. This Current Ratio of <1 raises a “red flag,” indicating that the hub at that time would not have been able to pay off all its current liabilities using only its

current assets. However, a closer look at the list of current liabilities shows that several of them were not actually required to be paid off within the year. For example, a short-term loan from the owner to the business appeared in current liabilities. This loan reflected capital that the owner has contributed to the business, but hoped to recover. As noted in Chapter 2, representing this kind of capital as a short-term loan may be appealing, because it makes the capital easy for the owner to retrieve (Levin & Travis, 1987). In this case, however, the owner did not actually take back all the funds at the end of any year, so showing them as a current liability served to make short-term obligations appear larger than they really were.

Still, the food hub may have been having trouble meeting its short-term obligations at the end of 2014. Like many hubs, Food Hub 2 heavily used cost-free short-term sources of credit, such as pre-paid sales and Accounts Payable, to cheaply finance their operation. This made current liabilities large. In fact, they constituted 79% of total liabilities and 155% of total assets – playing a key role in the food hub’s insolvency problem, which we will discuss later. (By comparison, current liabilities on average make up 72.5% of total assets for conventional produce wholesalers.)

For **Food Hub 3**, since assets on the balance sheets were not allocated among programs, it was not possible to calculate the Current Ratio for only the retail and wholesale food hub programs. We did, however, calculate the Current Ratio for the whole business. This ratio reflects relevant current assets and liabilities as well as those unrelated to the food box and wholesale program. Still, the Current Ratio gives a general sense of organizational liquidity. The calculated ratio of 2.1 in 2014 shows that the organization was maintaining good liquidity, on a par with Food Hub Benchmarking Study averages and better than the benchmark for the

conventional wholesale industry. The organization's other non-food-hub enterprises were heavily grant-funded, and grant funding may have helped contribute to working capital.

Food Hub 4's average Current Ratios in 2013 and 2014 were lower than benchmarks, but higher than 1. Sources of working capital used by Food Hub 4 during this time included shareholder equity, grant funding, and an operating loan. Until late 2014, these sources of capital probably helped buffer the shortage of cash created by continually negative profit, long receivables terms, short payables terms, and slow turnover of frozen inventory. However, by the *end* of 2014 (not shown in the averages in Table 17), the food hub had run through its cash reserves and the Current Ratio was at 0.85. At this point, current assets were less than current liabilities, and the business was probably squeezed for cash. Businesses like Food Hub 4 that have long Days in Inventory typically need a larger Current Ratio since some of their working capital is trapped in inventory, making the situation even more pressing. Since almost all of the assets owned by Food Hub 4 were current assets, the Current Ratio strongly impacted the debt-asset ratio.

To summarize results of the cash and liquidity measures, three of the four food hubs did experience negative working capital at some point (Current Ratio <1), which is consistent with what we would expect based on the literature (Welsh & White, 1981; Vanderburgh-Wertz & Ram Moraghan, 2014). Three of the hubs did seem to be using the practice of maintaining Days Payable longer than Days Receivable to generate cash flow, based on the patterns in the metrics and by their own admission in interviews. However, they were all able to pay their farmers and suppliers within 30 days, unless they were experiencing severe financial hardship (as with Food Hub 4 in its final year). Results from Food Hub 4 illustrate that it may be more difficult to

negotiate short Receivables when working with exclusively wholesale buyers. The relative Days Receivable for the wholesale vs. retail outlets of Food Hubs 1 and 2 support this. Conversely, the very short Days Receivable associated with retail food box programs at Food Hubs 1, 2 and 3 showed positive benefits for cash flow, although they did not always result in a strong Current Ratio. Finally, the case of Food Hub 4 shows how continually negative profits can eventually erode the Current Ratio, even if the business starts out with a large cushion of working capital.

4.3.2 Efficiency Metrics

For food hubs, efficiency is closely tied to profitability. In this section we look at several measures of labor efficiency, which are important because labor is the number one operating expense for most food hubs. Additionally, to measure overall efficiency in using assets to generate sales, we consider Asset Turnover. As measures of efficiency and risk we also recommend that food hubs calculate customer and vendor concentration, but unfortunately we did not have enough data to do so in our case studies.

In analyzing labor performance, the Food Hub Benchmarking Study recommends looking at *costs* (via Labor to Sales Ratio and labor costs per worker equivalent), *sales* (via Sales per Worker Equivalent), and *efficiency* in converting worker time into sales. As a measure of overall efficiency we look at Asset Turnover, which shows how efficiently the business uses its assets to generate revenues. This measure is impacted by the use of fixed assets and infrastructure, as well as its monetary assets.

Labor to Sales Ratio: According to the benchmarks, food hubs tend to spend more on staffing and labor expenses (18.3% of sales revenue according to the Food Hub Benchmarking Study)

than broad-line grocery wholesalers (3.6% of sales revenue) or conventional grocers (6.3% of sales revenue). Our case study findings support this observation. Food hubs may spend more on labor because of the additional services they offer, such as working with smaller producers, adding value through point of sale materials, providing supply chain transparency, or offering education. It may also be because food hubs pay workers a better wage, substitute less labor with technology, or experience scale-related inefficiencies in comparison to multimillion dollar conventional wholesalers.

For example, **Food Hub 1** spent more of its revenue on labor (11-13%) than wholesale or conventional businesses did. However, it spent consistently less than the food hub benchmark (18.3%) and the other case study hubs. Labor to Sales Ratios decreased slightly over time, suggesting improvements in labor efficiency. Since Food Hub 1 was the oldest food hub in our study, they may have been enjoying the benefits of experienced staff, improved process efficiency and strategic technology investments that improved the cost-effectiveness of their staff time.

For **Food Hub 2**, the 2012 portion of revenue that was spent on labor (21.4%) was larger than the food hub benchmark. The hub spent somewhat less than the benchmark in 2013 (16.8%) and 2014 (17.6%). The owner described 2014 as being a year “heavy on payroll expenses” because they were “investing in a team.” However, in actuality expenses increased by less than 1% that year, and the firm also enjoyed gains in efficiency, as we will see later. Food Hub 2 seemed to be headed in the right direction with regard to labor expenditures.

For **Food Hub 3**, Labor to Sales Ratios (14.1% in 2013 and 17.3% in 2014) were consistently below the averages from the Food Hub Benchmarking Study. This may partly reflect the food hub’s ability to allocate costs across its multiple programs, so that its more

profitable programs could absorb the administrative staff costs of its less profitable programs. Also, the hub may have created efficiencies in overhead staffing costs by spreading them across multiple programs.

Since Food Hub 3 tracked labor expenses for each program, it was possible to calculate the Labor to Sales Ratio by program (counting sales and fees, but not charitable funding, as part of each program's income):

2014 Labor to Sales Ratios by Program

Wholesale: 12.21%

Retail / Food Box: 25.5%

Overall: 17.3%

As shown, 2014 labor costs per revenue dollar in the retail program were about half those in the wholesale program. This makes sense because of the labor-intensive nature of the retail food box program, which requires managing numerous customers and drop-off sites and packing thousands of individual food boxes. It illustrates why retail requires a higher margin than wholesale to be profitable. (Note that sales made from the wholesale program to the food box program are counted twice in the program-specific figures; we did not attempt to split them out because those sales were associated with labor costs in both programs.)

Food Hub 4 had a Labor to Sales Ratio that was very high in 2012, but decreased sharply in 2013 and fell very close to the Food Hub Benchmarking Study averages by 2014. This suggests that over time the food hub became much more efficient at converting labor expenses into sales. It is worth noting, however, that labor costs alone exceeded the hub's entire gross margin in all three years.

Overall, Labor to Sales Ratios varied from food hub to food hub. Two of the cases had ratios higher than the food hub benchmarks, suggesting less efficient use of labor dollars; the other two had ratios lower than the benchmarks. The two hubs with the lowest ratios were the oldest food hub and the food hub that shared administrative and managerial staff with other enterprises. Many other factors probably combined to affect the Labor to Sales Ratio, including food hub age, managerial practices, staff training, staff turnover, use of labor-saving equipment, and relative volume of sales in labor-intensive retail programs.

Sales per Worker Equivalent: We were able to calculate Sales per Worker Equivalent for Food Hubs 2, 3 and 4 given available data. Doing so required determining how many Full Time Equivalents (FTEs) of staff hours were used by each food hub in each year. In our results, all three case study hubs had Sales per Worker Equivalent measures that were noticeably lower than the food hub benchmark. At first glance, this implies that their activities were more labor intensive and/or less efficient than those of other hubs.

For **Food Hub 2**, for example, Sales per Worker Equivalent in 2012 and 2014 was less than half that of the “average” food hub. One possible reason would be that they did more direct-to-consumer retail (90%-100% of sales) than the average hub in the benchmarking study (for which direct-to-consumer markets comprised 39.17% of sales). Retail sales usually require more staff time for packing, customer service, etc. than wholesale. This labor intensiveness may have paid for itself, since retail sales fetched an unusually high gross margin for Food Hub 2. However, as the business scales up its lower-margin wholesale program, it would be useful to take a close look at staffing efficiency and to set targets for future performance.

Food Hub 2 also provided us with payroll information that enabled us to view their labor usage in greater detail. One interesting observation was that the number of seasonal employee FTEs nearly doubled from 2012 to 2013, comprising about half of the total hours worked during the hub's least profitable year. The number of different individuals working seasonally also appeared to increase that year. The food hub greatly reduced its labor costs from 2012 to 2013 when it used more seasonal workers, but Sales per Worker Equivalent also dropped. In 2014, the hub decreased its seasonal workers back to 2012 levels and hired more salaried staff. Even with the time it took to train these new staff, Sales per Worker Equivalent increased by about 9% while only increasing the Labor to Sales Ratio by 0.8% of sales. In interviews, one of the managers said that the food hub was "done with [using] seasonal labor" in 2014 and had made a deliberate decision to shift towards more salaried staff. Our observations confirm that moving away from seasonal labor may have been a prudent choice for improving efficiency.

It is interesting to note that Food Hubs 2 and 3 had low Sales per Worker Equivalent but also had low Labor to Sales Ratios. It seems self-contradictory to conclude that these two firms used labor in a cost-effective manner relative to other food hubs, but that their use of labor hours was less efficient than average. There are a variety of reasons for which this might have happened.

One possible explanation is that the food hubs were accomplishing a greater portion of their total work with lower-paid workers, such as part-time pack line staff and truck drivers, than other hubs. This would make their Labor to Sales Ratios low. For example, in 2013, 82% of staff time allocated to the wholesale and food box programs at Food Hub 3 came from workers paid no more than \$30,000 per year. In 2014, it went down to 65%, and the food hub's labor expenses went up that year.

Lower compensation rates for staff at all levels would also explain the low labor to sales ratios at Food Hubs 2 and/or 3. At Food Hub 2, several of the staff were owners or founders of the business, and indicated that they had been willing to accept low or no pay because of a commitment to growing the business. The salaries received by the managers of Food Hub 2 were 30-50% lower than those received by comparable staff at the other food hubs in our case studies. Low compensation may be a cost-saving measure in the short run, but it meant that unpaid or underpaid staff were effectively subsidizing the business, making it look more profitable than it really was. In the long run, a more sustainable approach to staffing may be necessary to avoid staff burnout.

A third explanation for the low labor costs, specific to Food Hub 3, would be the allocation of labor costs. As noted, Food Hub 3 allocated its staff costs among multiple programs. If managers allocated higher-paid managerial staff to programs outside our analysis, the hub would appear to be spending less on staffing than it really was. If there were missed opportunities to increase staffing efficiency, some of the costs of those missed opportunities may have been borne by the other programs.

Setting questions of compensation aside, one additional interpretation of our food hubs' low Sales per Worker Equivalent could be that the food hub benchmarks did not reflect true national averages. Some plausible reasons for this will be discussed later, in section 4.5.

Asset Turnover ratio: Asset Turnover could only be calculated for Food Hubs 1, 2 and 4. For **Food Hubs 1 and 2** it was usually high compared to all the benchmarks from conventional industries, reflecting the modest size of these hubs' total assets in comparison to their sales volume. (There are currently no Asset Turnover benchmarks available for food hubs.)

Compared to the industry benchmarks, these hubs were able to generate a large volume of sales using very limited assets. Asset Turnover is impacted in part by a business' decisions about whether to rent or own its infrastructure and vehicles. So, in the case of Food Hub 2, high Asset Turnover Ratio probably reflects the fact that it rented its facility. Asset Turnover is also impacted by whether a business is using rent-free shared or borrowed infrastructure, whose value is not included on the balance sheet. Food Hub 1's Asset Turnover was probably high because it used some physical assets that belonged to another entity, paying minimal rent.

Food Hub 4's Asset Turnover was more moderate, a little below the benchmarks. It increased each year from 2012 to 2014, matching up with the business' increases in staffing efficiency during that same period. Because Food Hub 4 owned almost no fixed assets, this hub's Asset Turnover was essentially a measure of how efficiently it is using its financial assets to generate sales. It therefore makes sense that Asset Turnover and the Labor to Sales Ratio would be closely tied together.

For small businesses we might expect Asset Turnover to reflect the practice of "bootstrapping to minimize capital utilization," as described by Windborg & Landström (1997). This includes buying used equipment, hiring seasonal instead of year-round personnel, creating policies to incentivize customers to pay quickly, and leasing equipment instead of buying. These activities make it possible to do business without owning many assets – and in fact, both of the food hubs that had high Asset Turnover ratio were using at least one of these practices.

In summary, the efficiency metrics suggest that there may be room for improvement in the area of labor efficiency, although some food hubs performed better in this category than others. In general, decreasing labor costs were associated with increasing food hub age and

experience, both across hubs and from year to year within a given hub. Two of our food hubs may have been paying their staff at a less-than-average rate, possibly because they were doing a greater portion of their work with lower-paid part-time staff, or because salaried staff were willing to accept especially low salaries. Asset Turnover figures were more favorable than labor efficiency metrics, illustrating the efficacy of various bootstrapping practices in generating sales from few assets.

4.3.3 Profitability Metrics

In this section we look at measures of profitability, which consider revenues and expenses together. Gross Margin Before Costs of Sales reflects the amount of sales revenue left for expenses and profit after paying Costs of Goods Sold. Operating Profit Margin measures ability to generate net income, without considering the company's debt structure or tax status. It can be seen an indicator of profit potential if the business scales up. Return on Assets (ROA) measures actual return on each dollar invested in the business, allowing a direct comparison with other possible types of investments. While Asset Turnover measures effectiveness in turning assets into gross sales, ROA measures effectiveness in turning assets into operating profit. Unlike Asset Turnover, ROA takes operating costs into account.

We also recommend that food hubs track Sales vs. Forecast Budget, including breakdowns of sales by outlet, by drop site, etc. However, we did not gather enough information about food hubs' budgets to collect Sales vs. Forecast Budget for all the hubs.

Gross Margin (before Costs of Sales): Gross margins are a subject of interest for food hub managers because gross margins are so closely tied both to sales volume (in their relationship to

pricing) and to profitability. The case study results were consistent with the Food Hub Benchmarking Study in showing much higher gross margins for direct-to-consumer retail than for wholesale outlets. Table 20 summarizes food hub gross margins in the final year of the study, and shows the amount of net income each food hub made that year.

Table 20: Food Hub Gross Margins, Operating Expenses and Profitability
Final Year of Study Period

	Hub 1	Hub 2	Hub 3	Hub 4
Wholesale Margin	21.8%	20.9%	19.4%	7.9%*
Retail Margin	33.0%	46.5%	39.4%	n/a
Overall Margin	23.0%	44.3%	24.8%	11.0%
Operating Expenses	23.0%	36.6%	25.0%	50.7%
Operating Profit Margin	0.1%	8.0%	-0.2%	-39.3%

* The overall margin for Food Hub 4 was greater than its wholesale margin because membership fees and shipping & delivery income were included in the overall margin but not the wholesale margin.

Profitability depends on both gross margins and operating costs. In Table 20 we can see that overall gross margins varied widely from hub to hub. The wholesale margins for the three hubs that has positive or breakeven operating profit were all near 20%. However, a great deal of variation came from the direct-to consumer outlets, where food hubs' market power or pricing policies apparently varied widely. Operating expenses varied widely as well. Reasons for varying operating expenses include age, efficiency, business model and the relative amount of emphasis on retail sales, which tend to be more labor-intensive. Differences in operating expenses explain why Food Hubs 1 and 2 could have a 21% difference in their overall gross margins, but a smaller 8% difference in their Operating Profit Margin.

Food Hub 1 utilized a standard gross margin on its wholesale accounts, but a more flexible margin on its retail accounts. We can see that the resulting overall margin was always high compared to industry benchmarks (as were the margins for Food Hubs 2 and 3), but always

below the food hub benchmark. With modest operating expenses, the result was positive operating profit in every year.

Food Hub 2 stood out for having exceptionally high gross margins, and was clearly effective at achieving favorable prices with its farmers and retail customers. However, this hub had high operating costs (33-44% of revenue) compared to the food hub average (26.3%). As a result, Food Hub 2 did not make a profit in all three years. While it saved on labor compared to other hubs, it paid more than average for other expenses. Based on the financial overview, its expenses that were unusually high in 2013 probably including marketing costs and uncollected receivables. Even with high operating costs, though, it managed to obtain an impressive 8% operating profit in 2014.

The gross margin calculation for **Food Hub 3** treats all sales, including brokerage pass-through dollars, as “gross revenue.” Managers of the food hub reported a policy of charging a 15% commission fee on wholesale in 2012, which they changed to an 18% fee in 2013 and 2014 to better cover their costs. In reality the gross margins on wholesale (19.4% in 2014) were higher than expected from the food hub’s reported fee schedule. Expected gross margin from an 18% commission fee should be $0.18/1.18 = 15.25\%$. This was the only food hub for which realized gross margins were higher than their targets. (We should note that the wholesale gross margins for Food Hub 3 include sales made from the wholesale program to the food box. We did not attempt to split them out because those sales were associated with expenses in both programs. So, the overall gross margin is not a perfect weighted average of the margins from the two programs.)

Our ability to calculate the net income for each of Food Hub 3’s programs allows us to draw conclusions about the adequacy of their gross margins. We know that net income ranged

from -0.3% to 1% for the wholesale program, so the commission fee on that program appears to have been just sufficient to cover that program's operating costs without much grant funding. We also know that the food box program saw a net loss of -2.7% in 2014, suggesting that the food hub needs to either reduce its operating costs or increase its gross margin for the food box in the future.

The relatively low gross margin, high operating costs and large losses of **Food Hub 4** suggest that that food hub was struggling more than other hubs to price its services appropriately and to deliver services efficiency. The wholesale margin charged by Food Hub 4 was much lower than the wholesale margin charged by the other three food hubs. The food hub had very high customer concentration, meaning it was highly dependent on very small number of customers for the majority of its sales. This may have reduced its bargaining power and contributed, in part, to the low gross margin. Additionally, although we would typically expect a wholesale operation to have lower operating costs than a retail operation, the wholesale-focused Food Hub 4 had higher operating costs than all three of the food hubs that sold a combination of wholesale and retail. This may be because of its small scale, which could result in inefficiencies, and the relative newness of the food hub.

Notably, the overall achieved gross margins for Food Hub 4, which were never above 11%?, were much lower than the target gross margin of 20% that was reported to us in interviews. Food Hub 4's managers should revisit the pricing strategy that was laid out in their business plan, and closely monitor achieved margins. Interestingly, if revenue is considered as income, the food hub's gross margins increase to 24.2%-25.2%. It seems possible that the food hub may have been using its gross margins including grant income, rather than its gross margins before grant income, to determine whether it was meeting its targeted margins. This would help

to hide the fact that the food hub's pricing scheme is leading to such an unusually narrow margin. However, even with grants the gross margin does not cover operating costs.

The food hub closely at shrink, which is affecting the margin as well. In the 2014 financial statement, the "Q&A Samples and Unsellable" cost category under 2014 COGS represented 9% of overall Costs of Goods Sold and 8.2% of total revenues. This category included "QA issues, salesman/customer samples and spoils." If these costs had been eliminated from COGS, the gross margin would have been 16.1% in 2014 – still below the overall target, but headed in the right direction. Every dollar of lost product represents a dollar of lost gross margin, directly impacting profit. Thus, it appears that reducing losses from quality issues and shrink would be an important first step toward improving the business' bottom line.

In our interviews we learned that Food Hub 4 intended to increase sales of its value-added frozen line in order to widen its margins. The projected gross margin for the frozen product line was 30%. Expanding the frozen line might be a good idea, but only if records of realized revenue and COGS confirm that its margin is as least as high as the desired overall margin. Processing costs and delivery to and from the processing facility should be included in the COGS calculation for frozen products. The food hub should also consider costs of holding the frozen inventory, as we will discuss later.

Operating Profit Margin: Although three of the four food hubs attained positive operating profit at some point during the study, three of the four struggled with negative profits at some point as well. For Food Hubs 1 and 2, net losses in bad years were noticeably reduced when depreciation was adjusted to reflect a straight-line method.

Food Hub 1 was the only one found to have consistently positive operating profit without grants, once adjustments for depreciation were made. Age and experience probably contributed to this success, as mentioned previously. Relatively low labor expenses contributed to relatively low operating expenses, and the addition of a retail food box program helped increase overall gross margins. The firm was also able to utilize some borrowed infrastructure at minimal expense, which helped limit rent, capital costs and depreciation.

For **Food Hubs 2 and 3**, operating profits vacillating around zero suggested that they may have been moving through the “breakeven” phase described by Matson & Barham (2015): “covering operating expenses but not necessarily interest or depreciation.” However, Food Hub 2’s operating profits in 2014 were exceptionally high at 8%, suggesting that its new wholesale program, high gross margins, and unpaid owner labor hours were paying off. **Food Hub 3** reported no taxes or interest, so its Operating Profit Margin was functionally the same as the net margin. Without including grant funding in revenues, its metrics showed a small, positive operating profit in 2013 and a small operating loss in 2014. If grant funding is included in revenue, the overall operating profit in both years was positive. As mentioned earlier, Food Hub 3 tracked retail and wholesale program expenses separately, and retail appeared to be less profitable than wholesale. This is different from what one might expect based on the relative gross margins of wholesale and retail, and it highlights the value of tracking costs separately for different programs.

Food Hub 4 was newest of all the cases, and the only one with consistently negative operating profit. As mentioned previously, the managers of this food hub were squeezed between high operating costs and an atypically small wholesale gross margin. High costs are not

surprising given that the food hub was less than five years old, but they will clearly need to be reduced to fit within a reasonable wholesale margin.

Return on Assets: This measure could only be calculated for Food Hubs 1, 2 and 4. It tended to be large, and volatile from year to year because the food hubs in question had small asset bases. In years with positive profit, ROA was a very large positive number and in years with negative profit, ROA was very large negative number.

For example, **Food Hub 2** showed a negative ROA in 2013 when profits were negative, but a very high ROA of almost 50% in 2014 when profits were positive. Its average asset value of about \$211,000 was small relative to profits in that last year. The ROA values were even more extreme before figures were adjusted for straight-line depreciation, because the food hub's original depreciation method made its asset value lower than with our straight-line method.

Food Hub 1's ROA excluding grant income was positive, in the vicinity of the benchmarks in the first two years, but decreased dramatically in the third year. During this time the food hub's profits decreased while its assets increased from \$45,000 to \$119,000, mainly with the acquisition of a new truck. As with Asset Turnover, ROA appeared reasonably strong for this hub because most of its infrastructure was leased or borrowed at minimal cost, giving it an advantage over most for-profit wholesalers. By the same token, **Food Hub 4**, which also owned minimal infrastructure, showed consistently large negative values for ROA because it had negative profits each year.

Although ROA offers a perspective on how well assets are generating profits, and can be compared to ROAs from other firms, it may not be very useful for decision-making in a firm with few assets.

In summary, profitability metrics for the four food hubs showed variation across business models and illustrated the role of food hub age in impacting profitability. The widely varying gross margins for each food hub, particularly for direct-to-consumer programs, illustrate a range of possible approaches to pricing products and to mixing wholesale and retail marketing outlets. The food hub targeting wholesale outlets struggled the most with profitability, while the three hybrid hubs all succeeded in earning positive operating profit in at least two out of three years. All of the food hubs had struggled with profitability at some point in their lifetime, but during the study period the oldest food hub earned consistently positive operating profit and net income while the newest food hub earned only negative operating profit and net income. The two “middle-aged” hubs had profits that varied between positive and negative. Operating costs decreased with age, and clearly played a role in profitability. Pricing also turned out to be a challenge for the wholesale hub, whose below-average margin suggests that it may have lacked the bargaining power needed to achieve its pricing goals.

4.3.4 Solvency and Repayment Capacity Metrics

In this section we look at the Debt-Asset Ratio and the Debt Service Coverage Ratio, both of which have a large affect on firms’ ability to secure loans and attract investment. Debt Service Coverage Ratio measures repayment capacity, or whether the business is generating enough income to make payments on its long-term debt in the short run. It shows the number of times the business can cover scheduled long-term debt payments (principal and interest) using the income it generates before taxes, depreciation and interest. This indicates the degree to which a business can endure possible shortfalls in cash flow resulting from adverse economic conditions.

The Debt-Asset Ratio shows the portion of total assets that would need to be liquidated in order to pay off all liabilities, or the portion of the business owned by lenders, creditors and other entities who are not the owners. Solvency can become a big issue for food hubs, especially those that are started with a relatively small amount of owner equity. With slow and occasionally negative net income, a solvent business that is highly leveraged (i.e. one that has large liabilities in proportion to its assets) is at risk for becoming insolvent quickly if it incurs losses instead of profits.

Debt-Asset Ratio: In three of the four cases (Food Hubs 1, 2 and 4), a history of unprofitable years had significantly reduced the food hubs' equity over time, at some point increasing their Debt-Asset Ratio and making them insolvent (>100% debt-asset ratio). For Food Hubs 1 and 2, the problem was exacerbated by overly rapid depreciation of assets. After adjustments were made to reflect straight-line depreciation the ratios looked better, but were still very high.

For example, **Food Hub 1** began the study period insolvent, with a debt-asset ratio over 100%, but improved its position over the three years with its positive net income. The business had been financed largely with member fees, and its equity had been severely reduced by losses in previous years, but profits allowed equity to be built up again quickly.

Before adjustments, **Food Hub 2** initially appeared to become insolvent during its unprofitable year in 2013, with a debt-asset ratio of over 100%. By 2014 the ratio was 213.4%, meaning the value of the company's liabilities was twice that of its assets, a major "red flag." After our adjustments, the company was shown to be highly leveraged, but not insolvent. Aside from depreciation, why did Food Hub 2 have an increasing Debt-Asset Ratio? The firm had a small amount of equity to begin with (\$25,500 in 2012), as is common among small start-up

firms. As the company grew, its equity failed to grow with it, and it became more heavily leveraged. A highly leveraged business risks losing a large percentage of its equity if it has an unprofitable year, which happened in 2013 when the company saw -1.4% net (adjusted) income. Nonetheless, the adjusted Debt-Asset Ratio never exceeded the broadline wholesale benchmark of 84.7%.

For **Food Hub 4** the Debt to Asset Ratio increased dramatically each year during 2012-2014. The food hub started with a strong solvency position during 2012, with creditors holding only 12% of assets. In that year the remaining 88% of the business was held by the hub's shareholders and members, and the hub had no retained earnings of its own. Over time, though, negative profits accumulated in a negative retained earnings balance that reduced the value of shareholders' and members' equity. In 2014, on average, the food hub's shareholders and members owned only 21% of the business and the remaining 78.9% was owned by creditors. By the end of the year, the business had tipped into insolvency, with an equity balance of negative \$18,000. Since virtually all of the hub's assets and liabilities are current, the insolvency problem was a liquidity problem as well.

Only **Food Hub 3**, which managed food hub operations as part of a larger suite of services, showed little problem with solvency. Its Debt-Asset Ratio hovered around 50% in 2013 and 2014, meaning that the food hub owned about half of its assets and creditors owned the other half. As a business, this food hub also maintained a better solvency position than the benchmark for the Conventional Wholesale industry. Grant funding and grant-related cash, both from food hub activities and from other activities, may have helped supplement that food hub's working capital and create equity.

In general, challenges with solvency likely stemmed from not having much equity to begin with. Initial sources of equity appeared to include membership fees, member equity, contributed capital from owners and grants. In the co-ops, member equity was not heavily utilized. Only one business had external investors. Interestingly, of the three food hubs that experienced insolvency, two of them made positive profit in at least two years. These food hubs may still have been suffering from being undercapitalized and highly leveraged during their startup period.

Debt Service Coverage Ratio: The food hubs in the case study did not have much debt to pay interest on. The Debt Service Coverage Ratio varied from year to year for Food Hubs 1 and 2, whose small debt size tended to make the Debt Service Coverage Ratio high in profitable years. Whenever profits were negative, the Debt Service Coverage Ratio was by definition negative as well. The coverage ratio was irrelevant for Food Hubs 3 and 4, which recorded no term debt at all.

Food Hub 1 had a very high Debt Service Coverage Ratio in its first two years, because it had little term debt and positive profit. In 2013, the food hub entered into a capital lease for a truck, so its interest and principal payments increased, and the food hub's small profit margin allowed a much smaller cushion (a Debt Service Coverage Ratio of 1.3) for repaying the debt.

Because **Food Hub 2** had small long-term debt in proportion to its annual revenues, its coverage ratio was also comfortably above the recommended values in 2012 and 2014. In 2013 the coverage ratio was <1 because of the losses that the food hub faced. The food hub might have had trouble making its long-term debt payments in that year.

The finding that two of the cases had no term debt is interesting. Food Hub 4, for example, was financed entirely through current liabilities, grants and shareholder equity. Heavy use of current liabilities as sources of credit appears to be common among food hubs. This is probably because some short-term sources of credit, such as Accounts Payable or pre-paid consumer food sales, are cheap or free. Furthermore, because Food Hub 4 did not purchase much equipment, it probably saw little reason to seek term loans.

The relatively small amount of debt financing was consistent with observations in the literature that small businesses tend to use internal more than external financing. This will be discussed in greater detail in a later section.

In summary, our measures reveal challenges with solvency, but milder concerns about debt repayment capacity. Equity did not always grow in tandem with business growth. The food hubs in our case studies were at times highly leveraged and vulnerable to small changes in profitability from year to year. Because of the firms' small total assets, their Debt-Asset Ratio could deteriorate rapidly, but could also recover rapidly in profitable years. Debt repayment capacity turned out to be less of a problem than solvency because the food hubs in our case studies accepted so little long-term financing. Potential debt repayment capacity, though, would depend on whether a given food hub could obtain consistently positive profit. Notably, Kate Danaher of RSF Social Finance told us in an interview that she tends to look more closely at Debt Service Coverage Ratio than at the debt-asset ratio when deciding whether to grant a loan to a food hub (personal communication, December 4, 2015). This may explain how food hubs have continued to access operating loans and sometimes long-term loans while still facing solvency issues.

4.3.5 Summary of Potential Challenges Revealed Through Key Metrics

Table 21 summarizes some of the potential challenges identified in the financial analyses and the degree to which they were shared across the four case studies. In addition to challenges identified in the key metrics, challenges related to recordkeeping are also documented.

Table 21: Summary of Potential Challenges Reflected in Annual Case Study Metrics

As in the individual food hub case reports, metrics are based on annual, year-end (December 31) financial data adjusted to reflect straight-line depreciation. Metrics reflect items from the year-end balance sheets that were averaged across each fiscal year. “X” indicates that a statement was true for at least one year of the study period; “XX” indicates that it was true for more than one year.

	Potential Challenge	Case 1	Case 2	Case 3	Case 4
Liquidity	Days Receivable > 45 days				XX
	Days Payable > 30 days				X
	Days Receivable > Days Payable				X
	Current Ratio < 1	XX	X		*
Profitability	Operating profit < 0		X	X	XX
Efficiency	Labor to Sales Ratio > food hub benchmarks		X		XX
Solvency	Debt-Asset Ratio > 70%	XX	X	X	X
	Debt-Asset Ratio > 100%	X			*
Record-keeping	Adjustment from reported to straight-line depreciation increased operating profit by > 3%	X	X		
	Inventory not recorded		XX	X	X
	Accounts Payable and Receivable not recorded		X	X	

* This criterion was met at year-end of 2014, but was not reflected in annual averages.

So far this chapter has explored how key metrics can be used to analyze food hubs, and what the results tell us about our four case studies. Now we will turn to a broader look at themes in the data, and what they tell us about our original research questions.

4.4 Additional Observations Across Case Studies

In our case studies we sought to understand how the financial histories of individual food hubs reflect characteristics documented in the food hub and small business literature. In

particular, we looked for evidence of: limited access to capital and disproportionate use of internal over external financing; constrained working capital; difficulties with labor efficiency and staff retention; difficulties with pricing and price negotiation; grant dependence; and difficulties achieving profitability, especially below annual sales of \$1 million for wholesale and hybrid hubs. We also looked to understand what financial characteristics seem to be shared in common among food hubs of different sizes, ages, structures, business models and geographic locations.

Several of these issues have already been addressed in the discussion of key metrics. Our analysis of efficiency metrics suggested that labor efficiency was indeed a challenge for all of the case study hubs. Current ratios of <1 in three of the four cases suggested that food hubs do indeed face working capital constraints. The low gross margin achieved by Food Hub 4 suggests that that hub, in particular, struggled to price products in a way that would meet its targets for gross margins. The analysis of key metrics in general pointed out other common characteristics, including solvency problems.

In the this section we round out our analysis by exploring the questions of internal vs. external and short-term vs. long-term financing, grant dependence, and profitability at various scales.

Access to capital and the structure of financing: As described in Chapter 2, it has been noted in the literature that small businesses tend to use internal over external sources of financing. It has also been noted that new and small businesses tend to finance themselves with disproportionately current liabilities, such as trade credit (Accounts Payable) and operating loans. These two observations have both been used to support the claim that small businesses have trouble

accessing capital. Alternatively, they have also been given as evidence that small businesses are selective about sources of capital because they wish to maintain control over their operations.

Tables 22-24 show several perspectives on the types of funding used by the study hubs.

Table 22: Current and Long-Term Liabilities as % of Total Liabilities

From December 31 of final year in study

Type of Liability	External Source?	% of total liabilities			
		Hub 1	Hub 2	Hub 4	Produce Wholesale Benchmark*
Current Liabilities					
Accounts Payable	(X)	40.6%	18.2%	99.7%	44.0%
Bank line of credit	X	0.0%	15.6%	0.0%	
Loans from individuals		10.8%	7.0%	0.0%	
Credit card debt	X	6.6%	0.0%	0.0%	
Grant liabilities	X	4.0%	18.9%	0.0%	
Payroll liabilities	X	4.3%	0.0%	0.3%	
Food box liability	X	0.0%	19.4%	0.0%	
TOTAL CURRENT LIABILITIES		66.3%	79.2%	100.0%	66.5%
Long-term liabilities					
Bank loans	X	0.0%	11.6%	0.0%	
Capital leases	X	33.7%	0.0%	0.0%	
Loans from individuals		0.0%	9.2%	0.0%	
TOTAL LONG TERM LIABILITIES		33.7%	20.8%	0.0%	33.5%
TOTAL LIABILITIES		100.0%	100.0%	100.0%	100.0%

*From First Research, 2014

Table 23: Internal vs. External Sources of Liabilities Held by Case Study Hubs

From December 31 of final year in study

Source of liability	Hub 1	Hub 2	Hub 4
Internal sources	51.4%	16.1%	99.7%
Co-op members	51.4%	n/a	99.7%
Owners, friends, family	0.0%	16.1%	0.0%
External sources	48.6%	83.9%	0.3%
TOTAL	100.0%	100.0%	100.0%

Table 24: Equity Contributed by External Investors, as a % of Total Equity (Year-end)

	Hub 1	Hub 2	Hub 3	Hub 4
Year 1	0.0%	0.0%	0.0%	97.0%
Year 2	0.0%	0.0%	0.0%	98.1%
Year 3	0.0%	0.0%	0.0%	98.3%

In Table 22 we provide a breakdown of current vs. long-term liabilities on the balance sheets of each case study hub in the study's final year. For context we include some benchmarks from produce wholesalers as well. Next, in Table 23, we show the portions of each food hub's liabilities that came from internal and external sources. In our calculations, internal sources of financing include loans from owners, co-op members, friends and family as well as accounts payable to co-op member-owners, where applicable. External sources include bank loans, credit card debt, grant liabilities, payroll liabilities, food box liabilities (e.g. food box prepayments for orders not yet filled), capital leases and accounts payable to anyone who is not an owner. Unfortunately, since Food Hub 3's balance sheet reflected liabilities and assets that were unrelated to its wholesale and retail food hub activities, we could not include Food Hub 3 in the analysis presented in Tables 22 and 23. Finally, in Table 24, we provide a breakdown of sources of equity capital for each food hub. This table is fairly straightforward because only Food Hub 4 had external investors.

Table 22 shows that while the three case study hubs drew loans and credit from a variety of sources, current liabilities comprised 66-100% of total liabilities in all three. These proportions of current liabilities were greater than or roughly equal to the benchmark for produce wholesalers in all three cases. In other words, the food hubs in our study made greater use of current liabilities in financing their operations than larger produce wholesalers did. Notably, Food Hub 4 drew almost all of its liabilities from Accounts Payable in 2014, probably because it

was having difficulty accessing other forms of credit at that time. The other food hubs had more varied liabilities, but Accounts Payable always played an important role, just as it did for the benchmarked wholesalers (for whom Accounts Payable constituted 44% of liabilities, on average). The disproportionate use of current liabilities might be seen to suggest that food hubs cannot access term debt, or that they reject the restrictive covenants that long-term liabilities would require.

Whether a particular food hub made greater use of internal or external sources of financing depended to a large degree on whether it was a co-op. Because Hubs 1 and 3 required all suppliers to be co-op members, and because co-op members are also owners, Accounts Payable were technically an internal source of financing for these hubs. As a result, Food Hub 1 obtained slightly more than half of its liabilities from internal sources, and all of Food Hub 4's liabilities were internal. Although Food Hub 2 made use of loans from both owners and friends, the majority of its liabilities consisted of current liabilities from external sources, including Accounts Payable and lines of credit.

In some ways, the internal vs. external funding dichotomy seems insufficient to describe the different types of relationships that a food hub may have with its creditors. Some of the sources of credit used by Food Hubs 1 and 2 could be seen as external but "closely affiliated" to the hubs, posing less risk or less loss of control than an institutional lender would. These include the food box liabilities (owed to customers), payroll liabilities (owed to employees), and the Accounts Payable for Food Hub 2 (owed to farmers). As a values-based business, it is likely that a food hub would have a more lenient, trust-based relationship with such creditors than a large corporation would have with most of its creditors. After all, providing low-risk, interest free up-front capital is the fundamental concept behind Community Supported Agriculture programs,

which food box programs seek to mimic. Customers prepay for CSA boxes because of a values-based commitment to supporting a local business, even if the growing season goes poorly. CSA and food box customers do not expect to be paid interest on their prepayments, and risk for the CSA provider is somewhat low because they have some leniency in how much value they provide for customers. Similarly, some individuals on the payroll may be “patient” creditors, especially if they are owners or co-op members who feel deeply invested in their firm’s success. These individuals may be willing to accept deferred payment at times when their employer is constrained for cash. Additionally, farmers who have a close relationship with a food hub might be willing to extend additional credit or to convert some Accounts Payable into loans, if necessary. If we add “closely affiliated” sources of capital such as food box, payroll and Accounts Payable liabilities to the list of internal sources, then internal sources provided more than 50% of liabilities in all three food hub cases.

Another common feature among the three food hubs was the large amount of interest-free credit obtained by each. Sources of interest-free credit, at least in the short run, included Accounts Payable, food box prepayments, payroll liabilities and grant liabilities. These constituted 49%, 57% and 100% of total liabilities for Food Hubs 1, 2 and 4 respectively. Unfortunately we do not have a way to benchmark these figures against similar data for conventional wholesalers. However, it is interesting to note that except in the last year of operations for Food Hub 4, all four case study hubs paid less than the Broadline Wholesale benchmark for interest expenses, which was 0.4% of revenue (Troy, 2013). This suggests that the food hubs were making lesser use of interest-bearing loans and credit than their conventional counterparts.

Sources of equity offer an additional measure of access to internal vs. external financing, depicted in Table 24. As shown, Food Hubs 1-2 had no investors, relying entirely on member fees, owner contributions and retained earnings as sources of equity. Food Hub 4, on the other hand, behaved quite differently. Almost all of its equity was raised from external investors, except for a small amount that belonged to co-op members. This balances out its use of exclusively internal liabilities at the end of 2014. The case study hubs demonstrate what our interviewees also told us, that there are different approaches and philosophies regarding the use of external investors to capitalize food hubs.

How do these findings relate to the notion of the “finance gap,” or the idea that small businesses have difficulty efficiently accessing external capital and term debt? As discussed in Chapter 2, we know that limited access to outside capital was one of the challenges reported by food hub managers (Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly, 2012; Fisher, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013). However, it is also possible that food hub managers avoid external financing because of the actual or perceived risks involved, including the risk of losing control, as suggested by Meyers (1984). From the available data, we see that the food hubs made limited use of term debt and institutional lending, although it is difficult to determine the causal factors behind this. However, the prevalent use of interest-free credit suggests that food hubs may have had very practical reasons for avoiding bank financing. If food hubs were following a “pecking order” of preferred sources of capital, then short-term, interest-free credit from closely affiliated sources appear to have been near the top of the pecking order. Bank lending was used less often, and for Food Hubs 1 and 2, external investor equity was not used at all. By contrast, Food Hub 3 used a large amount of external equity, but almost entirely internal

interest-free credit. Clearly Food Hub 3 had no dislike of external investment, suggesting that different food hubs have different pecking orders.

In summary, the available data suggests that our cases had a strong preference for financing their operations with current rather than long-term liabilities, compared to conventional wholesalers. While food hubs used a combination of internal and external financing, they appeared to made less use of institutional lending than their conventional counterparts and proved effective at accessing interest-free capital. These findings still do not give us much information on how managers evaluated the riskiness, cost and accessibility of grants, loans and investments against sources of internal capital. The motivations behind choices of food hub financing would be a good topic for future research.

Use of charitable funding: All of the food hubs, regardless of structure, secured some grant or charitable funding – although not necessarily during the study period. For three of the hubs, grant and charitable funding never increased net income by more than four percentage points, which also means that it never exceeded 4% of total revenue. For the fourth hub, which was the newest and the least profitable, grant funds comprised a more substantial portion (11-16%) of income. This food hub’s managers did not report using grant funds for charitable or educational activities, but rather seemed to view its grant funding as necessary for operational startup.

The balance of food hubs’ non-charitable income was earned through business activities, most of which were product sales. Other sources of income included membership fees, shipping and delivery fees, and admission fees from special events held by the food hub.

In some cases, charitable dollars made the difference between positive and negative net income. However, as noted earlier, grant expenses are not always ordinary operating expenses.

A food hub might secure grant money to perform a public-interest activity that it would not otherwise perform, such as holding producer or consumer outreach events or providing educational programming at a school. While these activities probably have positive impacts for business, some of them would not occur if a grant were not secured. This is why we recommended looking at metrics both with and without grant income.

The discussion on internal vs. external funding we considered unspent grant liabilities to be external sources of capital. Whether grants really are a form of external financing is an interesting topic. Grant and charitable dollars come from external sources, but are typically viewed as income and not as debt or equity capital because they do not need to be returned to funders at the end of the grant term. In some ways, a grant maker operates more like a business customer than a lender; they form a contract with the grantee and expect specific socially beneficial services to be delivered in exchange for payment. In other ways, though, grant makers do resemble lenders or investors. As noted by Brislen, Woods, Meyer & Routt, (2015), grant makers can exert some control over a firm's choice of business activities. Like loans, grant applications usually have extensive information requirements resulting in high transaction costs. Additionally, donations and grant funds paid up front in cash probably function as an important external source of working capital; they can be "borrowed" internally for a variety of purposes and "repaid" to the grant account before ultimately being used for their stated purpose. Some grant funds can even be converted into permanent assets on the balance sheet, if the funder allows infrastructure purchases. So, grants probably play a hybrid role in food hub financing, worthy of further investigation.

Sales needed to achieve breakeven: As noted in Chapter 2, Matson & Barham_(2015) have proposed a breakeven annual sales level of \$1.19 million and a “viability” sales level of \$2.36 million for hybrid (combined wholesale and direct to consumer) food hubs. For exclusively wholesale hubs they proposed similar levels of \$1.21 million and \$2.4 million respectively. How do these figures align with our case study findings?

The results were mixed. Food Hub 1 enjoyed positive net income in years when it earned \$720,000 and \$940,000 in business revenues. Food Hub 2 achieved positive profit at \$1.3 million, but also at \$583,000. Food Hub 3’s profits were positive in the first two years, but turned negative when they reached \$2.25 million revenue mark, just short of Matson & Barham’s revenue threshold for “viability.” Food Hub 4, with \$130,000-\$420,000 in business revenue, never obtained positive profits. In general, the differences between Food Hub 4 and the other three cases support the idea that breakeven is more easily obtained above \$500,000. They also illustrate that for hybrid hubs, breakeven can be reached at a level below \$1 million. Finally, they show that that revenue levels of \$1-\$2.25 million in no way guarantee positive net income, and that food hubs’ profitability is likely to bounce back and forth within this range. This seems consistent with Mattson & Barham’s definition of breakeven, a level of profitability at which no money is “set aside for unexpected events.”

Reasons for the case study hubs’ less profitable years seemed to vary. Food Hub 3’s slightly unprofitable year involved relatively flat (9%) sales growth from the previous year, but a larger increase in operating costs. Food Hub 2’s unprofitable year featured a spike in operating expenses, increasing to 43.5% of revenue from 32.9% the previous year, apparently the result of a large marketing contract and high depreciation on new equipment. Food Hub 4 and others blamed weather factors for their least profitable year. On top of these specific issues, Food Hubs

1 and 2 were all dealing with a constantly changing composition of wholesale vs. retail sales. One of these hubs began with retail and later added a wholesale program, while the other began with wholesale and later added retail. Because choice of sales model impacts variable costs and gross margins, the mathematical breakeven point of each food hub probably moved up and down from year to year or month to month as their composition of outlets changed. So, while generalizations about breakeven for hybrid food hubs may be helpful from a planning standpoint, the reality is much more complicated.

Thus far, this chapter has summarized results of financial analyses from across the four food hub case studies. In the remainder of the chapter, we turn to a discussion of the financial evaluation process itself, including the usefulness of the metrics and the implications of food hubs' recordkeeping choices for financial analysis.

4.5 Usefulness of Metrics

The set of key metrics used in our case studies were informed by many sources. In practice, some metrics proved to be more useful than others when viewed from a decision-making perspective. In this section we evaluate the usefulness of each metric based on how it contributed to our case study analyses. We also revisit the research question, “to what extent are benchmarks from other types of food businesses, such as wholesale distributors and retail grocers, useful for evaluation of individual food hubs?”

In our dashboard of key metrics, the measures that informed liquidity and cash flow were Days Receivable, Days in Inventory, Days Payable and the Current Ratio. Together, Days Receivable, Days in Inventory and Days Payable can be used to calculate the length of the Cash

Conversion Cycle. In our analyses, Days Receivable and Days Payable proved very helpful in understanding how cash moved through each business and how billing policies affected cash flow. However, data to calculate Days in Inventory was usually not available, probably due to the perceived difficulty or expense of setting up an inventory tracking system. If inventory data had been recorded consistently, Days in Inventory would have been helpful both for understanding the cycle of cash flow and for understanding the efficiency with which the food hub used its warehouse space to turn over inventory.

The Current Ratio proved helpful in understanding liquidity constraints within the timeframe of the entire fiscal year, but was somewhat abstracted from the day-to-day accessibility of cash and working capital. A more immediate measure of Working Capital might have been helpful. For example, Robin Morris of Mad River Food Hub prefers using the measure *Net Operating Working Capital*, which reflects only the “most current” portions of current assets and liabilities:

$$\text{Bank Balances} + \text{Inventory} + \text{Accounts Receivable} - \text{Accounts Payable}$$

This could be a useful addition to the dashboard.

External benchmarks for Days Receivable proved helpful in understanding what average customer payment terms might be considered “normal” in relevant industries, especially for wholesale. Benchmarks for Days Payable, however, proved a bit less useful because they were so high. Food hubs generally articulated a values-based commitment to paying farmers quickly, certainly more quickly than in 45-50 days, so their figures were almost always below the benchmark. Additionally, in one of our interviews, Kate Danaher of RSF Social Finance mentioned that a food hub with Days Receivable of more than 30 days would raise a “red flag”

for her as a lender, because she would wonder if the food hub had enough cash to pay its producers.

The Days in Inventory external benchmarks proved only moderately useful. The seasonal nature of local food and the varying composition of food hub product lines made it difficult to make “apples to apples” comparisons to other industries. For example, the produce wholesale benchmarks probably reflect firms that hold little inventory as a part of their business model, and that hold similar amounts of inventory at all times throughout the year. By contrast, we would expect Days in Inventory to show large seasonal variation for most food hubs. For example, in order to meet winter-season demand, some food hubs had to store food for longer than would be typical in other sectors. This suggests that hubs should set different targets for different seasons rather than comparing themselves to the same industry benchmark throughout the year. In general, it is probably more useful to interpret inventory data in the context of the food hub’s own operations and cash flow needs than to compare it to others. Managers should be looking at the cash flow implications of inventory and regularly comparing the value of inventory to the projections used in their own cash flow budget. This should help them to avoid (or at least anticipate) unexpected cash shortfalls as a result of holding more inventory than they had planned.

Industry benchmarks for Current Ratios proved to be broadly applicable and useful for food hub analysis, especially in looking at food hubs from a lender’s perspective. In general, though, our liquidity and cash flow measures turned out to be limited in that none of them clearly captured the impact of prepaid food box programs or grant funds on available working capital and cash flow. Metrics based on cash flow statements might have been able to show this more clearly. Also, basing our analysis on year-end balance sheets prohibited us from tracking

seasonal changes in current assets and liabilities, which would give a much clearer picture of liquidity constraints.

The efficiency metrics in our dashboard included the Labor to Sales (and/or Revenue) Ratio, Sales (and/or Revenue) per Worker Equivalent, and Asset Turnover. (We also recommend that managers calculate vendor and customer concentration, although we were not able to do so in this study.) After beginning the study, we also began subtracting the Labor to Sales Ratio from the Gross Margin to calculate Margin Minus Labor, although it was not included in our key metrics. This turned out to be especially useful on a program-by-program basis because it shows how gross margin and labor costs interact with one another, and that gross margins tend to be larger for more labor-intensive retail programs.

The Labor to Sales Ratio proved easy to calculate, but because it is based on expenses, it does not distinguish labor efficiency from compensation rates. Labor to Sales Ratio benchmarks from wholesalers and conventional grocers did not seem especially relevant to the food hubs, since food hub work turned out to be so much more labor-intensive than typical wholesale and retail, but the food hub and cooperative benchmark provided useful context. In general, the Labor to Sales Ratio proved most useful when considered in the context of the food hub's own operating expenses and gross margins. It was also useful when looked at in combination with Sales per Worker Equivalent, which measures labor efficiency more directly, but is a harder measure to work with in practice.

Unfortunately, even the most profitable of our case study hubs had Sales per Worker Equivalent values far below the food hub benchmark. This could suggest that our cases experienced systematic problems with efficiency, but it could also mean that the benchmark value is too high. The methodology used to calculate this benchmark in the Food Hub

Benchmarking Study was to divide the total sales of each hub, as taken from financial statements, by total FTEs, which were summed from several categories of labor FTEs that each food hub reported in a survey. When trying to calculate total FTEs for the food hubs in our own study, we found it difficult to reconcile what food hub managers told us about FTEs and wages with what we found in their actual payroll records and recorded expenses. The changing responsibilities of part-time salaried employees and the use of seasonal employees made the calculation nontrivial. For us, making a good estimation of total FTEs required a detailed review of (a) a roster of salaried employees with start and end dates and weekly expected hours, including any changes in hours over time, and (b) payroll records showing total hours for hourly employees. Having observed inconsistencies between the records and what the managers said, we suspect that some food hub managers may not really know how many FTEs they use. Thus, it seems possible that food hubs who completed the Food Hub Benchmarking Survey may have underreported their total FTEs, although there is no way to confirm this. In general, improved tracking of labor FTEs may be necessary if managers wish to include labor efficiency metrics in their self-evaluation.

Asset Turnover was our one measure of general operating efficiency. Comparing Asset Turnover to benchmarks was not very meaningful, because food hubs tend to own so few assets, so their values tended to be high. Tracking Asset Turnover over time does give a sense of changes in how assets are being used to generate sales, although it may not inform any particular managerial policy.

To measure profitability, we used the Gross Margin before Costs of Sales, Operating Profit, Return on Assets, and of course Net Income. We also recommend that food hubs evaluate Sales vs. Forecast Budget, although we did not have enough data on food hub forecasts to do

this. Gross Margin was very helpful in understanding the relationship between pricing policies and profitability. Calculating Gross Margin per program proved to be particularly useful if costs were also being tracked on a per-program basis, because we could see the portion of gross margin left after program-specific costs, and compare the results across programs. At the beginning of this project we also tried calculating Gross Margin After Costs of Sales, following the methodology of the Food Hub Benchmarking Study, which involves subtracting variable packing and delivery costs from the Gross Margin (NGFN Food Hub Collaboration, 2015). However, this method required distinguishing variable labor costs, including variable activities performed by salaried staff, from fixed labor costs. We found the Gross Margin after Costs of Sales calculation to be a difficult one to replicate consistently, so we ultimately did not use it.

Benchmarks for gross margins provided an interesting comparison, but as we saw, gross margins can vary tremendously across food hubs and still yield positive net income. Looking at gross margin benchmarks may tell us more about what the wholesale market can bear than what is necessary to be profitable. In the case studies, we saw that the three most successful food hubs used a wholesale gross margin of roughly 20%, suggesting that this wholesale margin could be generalizable to other food hubs. The 20% margin fell in between the national food hub benchmark of 28.1% and the broadline wholesale benchmark of 16.3%. The retail margins in our cases, on the other hand, varied tremendously and were often higher than benchmarks. Thus, while food hubs would be well-advised to consult gross margin benchmarks in order to avoid overestimating what is reasonable, they should also look at their own local market conditions, operating costs, market power, customer loyalty and so on, and possibly consult with other established food hubs whose situation is similar to theirs.

Operating Profit Margin and Net Income have obvious usefulness in measuring the profitability and sustainability of a business, although the two measures tended to be about the same because the case study hubs were not paying much tax or interest. The relatively low industry benchmarks for Operating Profit Margin turned out to be within the range of profitability for the food hubs in our study, suggesting that they do have relevance. However, having seen the large differences in Operating Profit Margin that can result from different methods of depreciation, we would advise managers to calculate Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA) instead of or in addition to operating profit. One advantage of EBITDA is that it does not reflect subjectively determined depreciation methods. Also, depreciation is often added to financial statements at the end of the year, but EBITDA can be calculated at any time of year without having to calculate or adjust depreciation. As with Operating Profit Margin and Net Margin, EBITDA benchmarks are commonly available from the wholesale and retail sectors.

Return on Assets did not turn out to be a very useful measure for our case study food hubs because profits were so small and the participating food hubs held so few assets. The ROAs for food hubs were volatile and bore little relationship to the benchmarks. For trend analysis of a single food hub over time, ROA might be most relevant for a hub that owns most of the assets that it uses. Otherwise, food hubs may not need to calculate their ROA unless they plan to seek outside investors, for whom ROA allows a comparison of investment opportunities across different firms.

As measures of repayment capacity and solvency, we evaluated the Debt Service Coverage Ratio and the Debt to Asset Ratio. The Debt-Asset Ratio turned out to be extremely important because it revealed the solvency problems that food hubs were facing. The headline

wholesale benchmark for the Debt-Asset Ratio (85%) suggests that wholesalers are similar to our case study hubs in their tendency to be highly leveraged. The other benchmarks illustrate a more conservative position. It is probably less important to follow the benchmarks than to understand how high of a Debt-Asset ratio lenders are willing to accept in a particular business.

Conventional wisdom says that lenders become uncomfortable with debt-asset ratios above the 60% range, but this will vary by sector and by lender. In addition to considering the lender perspective, managers should also consider the degree to which their business is in danger of rapidly becoming insolvent, which depends on asset size.

The Debt Service Coverage Ratio provides a lender's perspective on a firm's ability to pay off term debt, which is helpful for a manager who plans to seek debt financing. It is easily calculated, although in our case studies it required looking beyond balance sheets and income statement records to identify principal payments that were made (or due). We did not identify benchmarks for Debt Service Coverage Ratios from food industries, but the rule of thumb of maintaining a ratio above 1.1-1.5 worked well enough.

In our analyses, the usefulness of each metric was determined largely by the data that a firm had or had not collected. The next section addresses challenges in food hub recordkeeping that emerged during our analysis.

4.6 Implications of Recordkeeping Decisions for Financial Analysis

Some measures were difficult to calculate or interpret because of each firm's decisions about how to record and represent data. The following recordkeeping factors impacted our analysis, and illustrate some of the unique challenges in evaluating food hubs as small

businesses. They also illustrate ways in which managers could improve their recordkeeping to make self-evaluation easier and more accurate.

- **Cash vs. accrual accounting.** The move from cash to accrual accounting makes income statements more accurate. Accrual-based statements reflect business activities that actually took place during the accounting period, matching expenses to the income that they helped produce. The monitoring of Accounts Payable and Receivable, which tends to accompany accrual accounting, also makes it possible to calculate more measures of liquidity and cash flow. Two of the four case study hubs did not make the move to accrual accounting until midway through the study, and were not recording Accounts Receivable and Accounts Payable until that point.
- **Tax-basis depreciation.** Depreciating assets using IRS schedules is appropriate for filing taxes, but can result in items being valued well below their market value in the first few years after purchase. For example, one case study hub depreciated almost the entire \$45,000 value of a new truck in the year it was purchased, which made the firm insolvent and resulted in a large negative profit. Two of the four hubs understated their profits by more than 3% due to using IRS instead of straight-line depreciation. Because depreciation appears as an expense on the income statement sheet and a debit from asset values on the balance sheet, it affects managers' ability to know their business' solvency and profitability. Managers should remain aware of how their accountants are calculating depreciation, and consider keeping managerial accounting records that use more modest (and realistic) depreciation methods.
- **Not tracking inventory.** Three of the four case study hubs did not track their inventory during the whole study period. One never tracked inventory at all. When inventory is

not being tracked in the accounting system, purchases of inventory items are usually recorded as a Cost of Goods Sold at time of purchase. In this case, the value of inventory simply disappears from the balance sheet until it is sold. For food hubs that were holding a large amount of unrecorded inventory, which some were, this skewed their Debt-Asset Ratio and made their equity look smaller than it really was. Tracking inventory also allows the Cash Conversion Cycle to be measured.

- **Methods of categorizing grants.** Some food hubs chose to show grants as short-term liabilities on their balance sheet until the grant funds were spent for their contractual purposes. This may make sense as an accounting method, especially if the grant will be spent for some purpose outside the food hub's normal operations. However, grants categorized in this way are confusing from a financial metrics standpoint; they appear as though the funds must to be paid back to the funder. They negatively impact the Current Ratio and Debt-Asset Ratio. Grants also caused some confusion when their income and expenses were mixed in with business income and expenses. Managers are highly encouraged to create a separate accounting class for grant expenditures so that they can be monitored separately from ordinary business expenses. This makes it much easier to assess profitability. They may also wish to subtract grant liabilities from the balance sheet when calculating metrics.
- **Loans made by an owner to the business.** One food hub owner chose to make a short-term loan to a food hub instead of contributing equity. As discussed in Chapter 2, this phenomenon is a common strategy among small business owners seeking to capitalize their business while making their funds easy to retrieve. In practice, the owner did not expect the food hub to repay the loan within the year, and instead left most of the money

in the business year after year. In our analysis of the firm, treating the loan as a long-term loan or owner equity might have been more accurate and would have improved the business' position.

- **Categorization of Expenses.** One of the four food hubs chose to categorize its expenses according to program, allocating them between wholesale and retail food box subclasses in their accounting system. This made an enormous difference in our ability to analyze the relative cost-effectiveness and profitability of each program. For example, we could calculate the Labor to Income Ratio for each program and look at how this efficiency measures impacted net income. We could also subtract variable costs from each program's gross margin to see what was left to cover overhead and profit. We would encourage food hub managers to track costs separately by program, at least for labor expenses, and ideally for variable and even fixed expenses.

Table 25: Effects of Adjustments on Year End Balance Sheet, Food Hub 2

	Without Adjustments	With Adjustments
Current Assets	\$43,623.84	\$43,623.84
Long Term Assets	\$94,809.88	\$211,625.59
TOTAL ASSETS	\$138,433.72	\$255,249.43
Current Liabilities	\$215,577.54	\$164,027.54
Long Term Liabilities	\$56,640.72	\$56,640.72
TOTAL Liabilities	\$272,218.26	\$220,668.26
Owner Equity	-\$133,784.54	\$34,581.17

Implications for Liquidity and Solvency:

Debt-asset ratio	197%	86%
Current Ratio	0.2	0.3
Solvent?	NO	YES

Table 25 gives an example of the impacts of recordkeeping choices. Food Hub 2 had undervalued its assets by depreciating according to IRS depreciation schedules on its balance sheet. It had also included a \$50,000 grant under “current liabilities,” making its short-term debt appear larger. Without adjustments, the food hub’s financial metrics showed it to be insolvent and to have negative working capital. But if the grant liability is removed and assets are depreciated using a straight-line method, as in the “With Adjustments” column, the business turned out to be solvent, as shown in the table.

From a recordkeeping standpoint, neither way of depicting the food hub’s assets is wrong, but from a financial evaluation standpoint the adjusted version gives a more accurate picture of the business.

4.7 Summary

This chapter has summarized findings from the four case studies and offered some evaluation of the financial evaluation process itself. In general, we observed that three out of four of the case study hubs exhibited working capital constraints, all of them struggled with labor efficiency concerns, three out of four at some point experienced high debt-asset ratios, and all wrestled with profitability. The youngest food hub was the only one that experienced consistently negative net income, even after receiving substantial grants. It struggled with high operating expenses and had a very narrow gross margin even for wholesale, suggesting that it was underpricing its services. This may have been due in part to high customer concentration, which resulted in limited bargaining power. The other food hubs were able to reach positive profits in the range of \$500,000-\$2.25 million of sales through various mixtures of wholesale and direct-to-consumer sales, but their profitability varied in a manner consistent with the

“breakeven” phase described by Matson & Barham (2015). All of the food hubs utilized grant funding at some point. However, with the exception of the newest hub, which relied on grants to cover a large portion of operating expenses, grant income never constituted more than 4% of total revenue. Grant income may also have had benefits for cash flow and liquidity which were difficult to capture.

None of the food hubs held much owner equity in their early years, with the exception of the newest hub, which had raised capital from external investors. The firms owned relatively few fixed assets, and several were struggling with a legacy of negative profits from their startup phase, which had eaten into their equity and left them highly leveraged. Factors affecting current assets and liabilities, including decisions about inventory, choice of customers, and policies on bill payment and collection, turned out to strongly influence each business’ Debt-Asset Ratio because of the large ratio of current to long-term assets. The small size of fixed assets and the disproportionate use of current liabilities suggest that these firms may have experienced limited access to external capital, especially term debt. However, it is difficult to say whether managers were “bootstrapping” because they could not access external funds, or because they had made deliberate choices to seek interest-free sources of credit, maintain control and protect their mission. Grant funding may also have helped reduce the need for external borrowing or investors.

Most of the proposed key metrics offered useful information for evaluation purposes. However, comparing Return on Assets and Asset Turnover to industry benchmarks yielded figures that were wildly different from industry benchmarks, probably because food hubs own so few assets. Evaluating Sales per Worker Equivalent proved worthwhile for understanding labor efficiency, but required an exact knowledge of worker FTEs that many food hub managers may

not have. Additional measures introduced partway through the study, such as Margin Minus Labor and variable costs by program, added depth to the analysis. Better measures of cash flow, showing the effects of grant income and prepaid food box programs, would have been helpful additions. Generally, the usefulness of metrics and the accuracy of our overall analyses were affected by managers' decisions about whether to use accrual accounting, whether to track inventory, how to value assets, how to represent owner capital, how to record information about grants, and whether to subcategorize the income statement by revenue center.

It is evident that the food hubs in our case studies faced challenges with regard to pricing, working capital, labor efficiency and possibly access to capital in general. The next section provides recommendations for how food hub managers might approach such challenges.

CHAPTER 5

RECOMMENDATIONS

5.1 Introduction

The purpose of this study has been not only to demonstrate an evaluation of business performance, but also to show how key metrics can be used by managers to make decisions. We have seen how financial analysis can reveal problem areas related to liquidity and cash flow, profitability, efficiency, solvency and repayment capacity, as well as more specific issues related to pricing, labor, shareholder relationships, and inventory management. In this chapter we provide guidance on making improvements in each of these areas, turning back to the literature where appropriate. *Note: the text in this chapter is adapted from the Managers Guide to Food Hub Financial Metrics, an Extension document produced as part of the present study. The recommendations in this section were written for a practical audience of food hub managers.*

5.2 Improving Liquidity and Cash Flow

The following practices, compiled from interviews and food hub manager feedback, can be used increase liquidity and assist with cash flow. These practices address issues that emerged from our study, including limited working capital and large write-offs on Accounts Receivable.

- **Make a cash flow budget** to anticipate possible cash shortages at certain times of year. Determine what sources of cash (including a line of credit, alternative lending, or grant and charitable funds) could provide enough of a cash cushion during the shortfalls.
- **Obtain a line of credit** for short-term working capital.
- **Develop sales outlets that benefit cash flow.** Pre-sell products whenever possible.

Examples of sales outlets that enable prepayment for products include online

marketplaces and prepaid direct-to-consumer food box programs. These outlets can provide cost-free credit from supportive customers.

- **Target some customers who can meet shorter payment terms.** For example, some food hubs report being able to use Net 7 (i.e. seven day) terms with restaurants because restaurants receive payment from their own customers almost immediately. Some customers may even pay cash on delivery.
- **Accept credit cards** where possible, in order to receive payments quickly.
- **Where possible, aim for shorter receivables terms (e.g. Net 7 or Net 15) and longer payables terms (e.g. Net 30).** Keeping Days Receivable shorter than Days Payable brings cash into the business. If paying producers quickly is part of the food hub's mission, or if the food hub serves customers such as schools that tend to pay slowly, this may not be possible. In this case it may be more important to obtain an operating loan and/or to emphasize the other cash flow strategies listed here.
- **Consider a role for charitable funding.** For example, some grant programs or donors may be willing to provide unrestricted funds for use as a cash cushion, similar to an operating loan that does not need to be paid back.. Privately donated funds may have fewer restrictions than grant funds.
- **Consider sources of equity financing.** Selling shares of the business can help generate working capital, although this can be risky because it may involve giving up some control of the company. For co-ops, member equity or low-interest member loans can also expand available cash.

- **Manage dividends carefully.** If there are shareholders or cooperative members who own equity in the company, consider carefully whether to pay dividends or patronage refunds out of profits. (Obviously this depends on agreements with shareholders.)
- **Reduce the time that goods spend in inventory,** where possible within the business model. If there are certain times of year when the business carries more inventory, incorporate this into cash flow budgeting. We will discuss inventory in greater detail later on.
- **Consider the implications of ownership vs. brokerage models.** A brokerage model has some disadvantages; for example, charging a flat brokerage fee means having less flexibility to negotiate a high gross margin on certain products. However, not taking ownership means not having cash tied up in unsold inventory that the food hub owns. The food hub also avoids risks of loss from product shrinkage in inventory.
- **Increase profitability.** More net cash income means more cash to reinvest in the business.

Many food hubs report challenges with collecting payment from customers on time. Receiving delayed payment from customers obviously affects cash flow. If there is no disincentive for paying late, customers may intentionally or unintentionally exploit the opportunity to extract free credit from food hubs.

In the case of Food Hub 2, we saw that write-offs (i.e. bills never paid by customers) became a problem, impacting profitability as well as cash flow. Their write-offs were as high as \$20,000. Costs of goods sold to non-paying customers eat directly into a food hub's profits. So, a little more time spent on collecting bills can yield a large return.

The following practices, paraphrased from a listserv discussion among food hub managers in the pre-2016 archives of the NGFN Food Hub Community of Practice listserv (<https://groups.google.com/forum/#!forum/ngfnfoodhub>), have been recommended by managers to improve collection of receivables. Most of these strategies apply to a wholesale context, but some can be adapted to direct-to-consumer programs.

- Send bills daily or at the end of each week. Customers can only pay a bill once they receive it. Automatically emailing statements on a regular schedule through Quickbooks™ can be helpful.
- Check credit and/or require references for customers who will be buying products on credit. For new customers, require cash on delivery for the first three orders or until a credit check can be completed.
- Aim for 7- or 14-day payment terms where possible. Different terms make sense for different customers. Restaurants may be given terms as short as 7 days because their revenue comes through cash and credit cards. Other customers may need longer terms if their own cash conversion cycle is longer.
- Speak to customers in person to confirm their credit terms. Build a relationship.
- Establish a credit limit with customers.
- Consider offering a small percentage discount for early payers.
- Monitor aged receivables closely. Personally reach out to late payers. If necessary, work with them to establish a payment schedule of partial payments, with due dates.
- Make a rule about when to stop delivering to late payers. For some food hubs, the cut-off point is 90 days. If receivables age past an acceptable number of days, and if the

customer has stopped paying their bills completely, stop credit sales and require cash on delivery.

- Make use of the Perishable Agricultural Commodities Act (PACA) and obtain a PACA license. PACA is a legal tool that provides special rights for produce wholesalers, including the right to receive full payment within 10 days of delivery. All produce wholesalers are covered by PACA, but having a license can assist a wholesaler with the enforcement of their rights. Avoid unintentionally waiving PACA rights by agreeing to payment terms in excess of 30 days or providing inconsistent information about pay periods on invoices and contracts.

In spite of its best efforts, a food hub may still end up with receivables over 90 days old, which tend to be viewed unfavorably by lenders. If this happens, it may be necessary to take them out of current assets and count them as a loss (or write-off). Aged receivables over 120 days should definitely be counted as a loss. This allows a more realistic valuation of business' current assets and profitability, especially if the customer responsible for the aged receivables has stopped sending payments altogether. However, if the customer is still in touch and is making payments on older bills, their aged receivables should not be written off yet.

5.3 Improving Profitability

All of the food hubs in our study struggled to maintain consistently positive profits.

Since all key metrics are interconnected, all should be kept in mind when looking for ways to improve profitability. Many of the recommendations for improving efficiency and cash flow can

impact profit as well. Below are some specific principles for improving profitability, again drawn from our interviews and study findings.

- **Form realistic expectations for gross margins.** According to Kate Danaher of RSF Social Finance, unrealistically high projections of gross margins are one of most common (and most important) mistakes that food hubs make (personal communication, December 4, 2015). It is important to know the norms of the industry and the expectations of customers, especially when planning to expand beyond an initial customer base. Expect cyclical and non-cyclical changes in margins over the course of the year as produce goes in and out of season and market prices vary.
- **Monitor margins closely, by program.** Food hubs that do not use a predetermined percentage markup (e.g. 18% for all products) experience a tradeoff. On the one hand, they are free to negotiate on price and to take advantage of the highest margins that the market will allow. On the other hand, they may not know the overall gross margin they are achieving. Such hubs should monitor actual (achieved) gross margins for each program on a weekly or monthly basis to make sure they're on target. Also, check achieved margins on sales to especially large customers or categories of customers.
- **Know the gross margins associated with each product line, and expand accordingly.** Try to identify what is profitable based on past data rather than targets or assumptions. Evaluate achieved gross margins individually for product line categories like produce, meat, frozen goods, and dairy. This requires tracking COGS and revenues separately for each product line.
- **Look at gross margins and Costs of Sales together.** In food hub accounting systems, try to categorize operating costs, especially variable and labor costs, by program. Over

time, monitor costs in relation to the gross margin for each program to see whether variable costs per sales dollar are increasing, decreasing, or staying flat as sales volume increases. If expanding from retail to wholesale, pay close attention to operational efficiency to be sure the smaller gross margin will cover costs. If focusing on direct-to-consumer retail programs, remember that their appealingly high gross margins do not necessarily equate to more profit. In our case studies, retail programs were sometimes less profitable than wholesale – because of the large amount of labor, credit card processing fees and packaging costs involved. This illustrates the importance of tracking variable costs by program.

- **Pay attention to trade-offs, especially with inventory items.** Sometimes inventory items such as value-added products or frozen meats obtain a high gross margin. Be sure that the cost of keeping these items in inventory will be covered by the added margin. Calculate the *holding costs* of inventory to determine whether apparently profitable inventory items really are profitable. See Section 5.8 for details.
- **Consider changing prices or markups.** Sometimes price or markup changes are necessary. Most successful food hubs report having had to adjust standard margins or markups to cover expenses. When larger wholesale companies need to increase prices, they schedule the changes with customers in advance, so that customers can plan ahead. For more detailed ideas about pricing and margins, see Section 5.
- **Invest judiciously in branding and marketing.** In our case studies, two food hubs saw high costs from marketing expenses that did not seem to yield the desired results. Sometimes hiring an in-house marketing person is effective; other times it may be better

to hire an experienced external marketing firm. Either way, interview several candidates and check references before committing to a contract.

- **Use grant funding strategically.** Grant funding should be used to build capacity for more retained earnings in the long run, but ideally not to prop up losses year after year. Consider spending grants on assets that will improve profitability in the long run. Examples include marketing services that will increase sales, or infrastructure that will increase efficiency and capacity. Notably, grant funds used to buy fixed assets will translate directly into equity on the balance sheet, making the business more appealing to lenders and investors.

5.4 Resolving Efficiency Issues

All of the food hubs in our case study had reason to increase their labor efficiency, especially as measured by Sales per Worker Equivalent. It is important to recall that all personnel in the business, not just sales and marketing staff, contribute to increasing the volume of sales. To improve staff efficiency at generating sales, the Food Hub Benchmarking Study suggests asking the following questions (note: these are suggestions from the study's authors, not findings of the study itself):

- Should we be doing more or different marketing?
- Do we have the right people doing the right jobs?
- Can we give our staff sales training?
- Do we do performance evaluations on key personnel?
- Where can we improve sales efficiencies or remove bottlenecks?

- Is our pricing appropriate?
- Have we built a marketing plan with a sales goal?
- Does our entire team know the plan? (NGFN Food Hub Collaboration, 2015)

Other recommendations include:

- **Focus on decreasing the Labor to Sales Ratio and increasing Margin Minus Labor (gross margin minus the Labor to Sales Ratio) on a program-by program basis.** It is useful to break staff expenses up by program or function in order to compare labor efficiency metrics for wholesale and retail. Limit seasonal labor hours in situations where seasonal labor is not the most efficient way to get tasks done. Continue to plan ahead for growth to avoid staffing bottlenecks.
- **Look closely at compensation and benefits** in tandem with efforts to reduce turnover and increase labor efficiency. Retaining talented staff and attracting future talent will yield returns in the long run, but may require higher compensation. See Section 5.7 for more about setting appropriate compensation.
- **Reduce losses from product spoilage and quality concerns.** These losses can have a large impact on the gross margin. To be able to monitor them closely over time, consider using Quickbooks™ to separately track costs of shrink in inventory and costs of quality-related product returns by customers.

5.5 Improving Solvency

Three out of four food hubs in our study struggled with solvency. In general, the two ways to improve the debt-asset ratio are to build more equity and to reduce total liabilities. The best way to build equity is to be profitable so that debts can be paid off. In an article for farm businesses, Alex White of the Agricultural and Applied Economics program at Virginia Tech suggests the following approaches.

- Sell unneeded assets and use the proceeds to pay down your debts
- Take good care of your assets (preventative maintenance) so they will hold their value longer
- Reinvest profits back into the operation – be sure to invest in productive, profitable assets, though!
- Find outside investors for your business -- If you are a c-corporation you might sell additional shares of stock, etc.
- Don't take on additional debt if you can possibly help it (White, 2007)

Additional sources of equity for food hubs include member equity (for co-ops only) or grants that can be spent on long-term assets. However, co-op member equity accounts may be treated as a liability by some lenders. The decision about whether to seek outside investors for a food hub, especially if it is having profitability problems, is a serious one, as it usually involves giving up some control of the business.

To improve repayment capacity, a business owner can either increase Earned Income Before Interest, Depreciation Taxes and Amortization (EBITDA) or reduce the amount of current debt that it owes. This can be done by paying off existing long-term debt, but also by refinancing short-term debts into long-term loans.

If a company is unable to service its debt and is veering towards default on its loans, owners should think outside the box about how to improve their position. One of the service providers we interviewed told us about a food hub that was having trouble creating enough cash flow to pay off the last few years of a debt. Managers knew that once the debt was paid off, they would be “in the black” again. The food hub went to its farmers and told them it needed a temporary 2-3% increase in gross margins, effective only through the end of the debt term. The extra 2-3% would be placed in a reserve account and used exclusively to make debt payments. The farmers agreed to accept a temporary decrease in prices on the condition that the food hub would reinstate the original pricing once the debt was paid off. This flexibility was possible in part because farmers were also owners and shareholders of the hub (K. Danaher, personal communication, December 4, 2015).

5.6 Pricing and Margins

At least one food hub in our study suffered because of its very low gross margin, and several of the managers we interviewed were interested in improving their pricing strategy. Since narrow gross margins tend to be a challenge for food hubs, finding the right margin and choosing a successful pricing strategy are critical. In this section we provide a basic overview of some “textbook” approaches to pricing, then give examples of how real food hubs deal with price in practice. We also discuss common issues related to pricing, including the issue of farmers selling “around” the hub.

5.6.1 A “Textbook” Approach to Pricing

There are two components that determine the gross margin retained by a food hub: the cost side, including operating costs and purchase prices paid to farmers, and the demand side, including the selling price that customers are willing to pay. Usually, prices are determined using some combination of information about the cost side and the demand side.

The cost side. Some businesses take a *cost plus* approach to pricing. To determine selling price, they start with the cost of providing a quantity of goods, and then add a markup. One method of cost plus pricing takes into consideration not only the Costs of Goods Sold (including processing), but also the variable costs of packing, processing (if applicable), delivery and fixed costs of maintaining a facility (Noreen, Brewer, & Garrison , 2011). A hypothetical example might look something like this:

Table 26: Cost Plus Pricing per Case of Broccoli
For forecast monthly sales of 1,000 cases. All prices and costs are fictional.

Cost	Amount	Description
Cost of Goods	\$30 / case	Price per case of broccoli purchased by the food hub
+ Variable Labor	\$3 / case	Estimated cost of labor needed to pick and deliver each case
+ Variable Overhead	\$2 / case	Other per-unit costs that increase with quantity, like fuel
+ Fixed Overhead	\$1 / case	Costs that don't vary much with quantity, like rent and insurance, divided by number of units. Suppose these are \$1000 per month and the hub sells only broccoli, then fixed overhead per unit is \$1000 / 1000 cases = \$1 / case
= Unit Product Cost (absorption cost)	\$36 / case	Total of per-unit costs above
+ Selling & Admin Expenses + Desired Profit	\$4 (~11%)	This is used to cover any remaining selling and admin expenses and profit
= Target price	\$40 / case	Desired selling price to charge to customers

The amount added to the Unit Product Cost should be big enough to cover any selling and administrative costs and still leave enough profit to meet profitability goals. In the example,

the food hub has determined that it needs to add an 11% markup to the *total* costs of buying, storing, picking, packing and delivering the broccoli (costs which total to \$36/case). So, the food hub aims for a selling price of \$40/case. The hub may have chosen this markup based on experience, recommendations from other food hubs, or a calculation.

It is important to notice that at a given price, if the number of cases of broccoli sold is different from the sales forecast, profits will change. If the food hub in the example sells more than 1000 cases, profits will be larger than the target profit. If it sells less than 1000 cases, profits will be smaller than the target, and might be negative.

Cost plus pricing is not an exact science. Some of the values needed for the method on the previous page, like labor per case, might be hard to estimate. Often, managers use trial and error to determine what markups are needed to cover their costs – but back-of-the-envelope calculations like the one shown can help as well.

The demand side. As any manager knows, costs aren't the only factor in pricing -- the demand side plays a huge role as well. Considerations include: what price are customers willing to pay for particular items? How much will demand change if prices increase? To what degree are customers segmented in their characteristics and in their willingness to pay? To what extent, and how, can the food hub charge different prices to different segments?

The Lerner Index tells us that if demand for a particular product is price-inelastic, then the seller has more price-setting power, and a larger price markup should be possible. If the demand is price-elastic, then sellers must charge a smaller markup (Elzinga & Mills, 2011). Consider eggs, for example. Grocery stores sell many eggs, and although consumers may consider them a staple, there is plenty of competition in the egg-selling market. Suppose a store

knows that consumers are price-sensitive when it comes to eggs. As a result, they mark them up less than other products. They may even treat eggs as *loss leaders*, taking a small loss on each unit to lure in customers, hoping they will also buy other products with larger markups.

Following a similar logic, several food hubs we interviewed obtained a 15% gross margin on eggs while obtaining a 20-30% gross margin on almost everything else they carried. We were told that a customer's standing order for a weekly delivery of eggs can be a good foundation on which to add other, more lucrative sales. So, charging a competitive price on local eggs turned out to be worthwhile. Getting a feel for the price-elasticity of different products helps vendors to create an overall pricing strategy that balances out to positive profits, even though some items may be sold at low markups and even at a loss.

Other relevant pricing concepts include *price skimming* and *premium pricing*. *Price skimming*, a form of *periodic pricing*, involves introducing a product at a high price and gradually lowering it over time, to try to capture the best price possible from those who are willing to pay extra to get the product early (Tellis, 1986). This is essentially what farmers are doing when they charge a higher price for early-season produce.

Premium pricing usually involves selling two grades of products at different prices that are produced using roughly the same process (Tellis, 1986). The seller might take a loss on the low-priced product but make a profit on the high-priced product. A farmer selling higher-priced Extra Fancy heirloom eating apples and lower-priced culls from the same orchard would be an example of premium pricing. We would expect the Extra Fancy apples to generate a profit on each unit sold. The culls might be sold at a loss, for less than their per-unit variable cost of production. Selling the culls would still be beneficial to the farmer, though, if it helps him recover his fixed costs for things like equipment and inputs. Alternatively, the farmer could find

a market for the culls where they have more value, for example as child-sized apples for school lunches. Either way, premium pricing requires thinking about high-grade and low-grade items together so that the overall result maximizes profit.

5.6.2 Food Hub Pricing In Practice

In practice, food hubs generally take one of two basic approaches to pricing: either they charge a fixed gross margin, or they use a flexible gross margin that varies with farmer needs, market prices, customer expectations, and product line. Some hubs pay all farmers the same price for a particular product, while others do not. Some hubs charge all customers the same price for the same product, while others do not. Either way, managers tell us that pricing is part of a more complicated equation of building trust and relationships on both the supply and demand sides. Quality relationships are key to suppliers' and customers' willingness to work with the food hub on price.

Working with customers. To obtain good prices from wholesale customers, organic farming consultant and author Atina Diffley recommends these basic principles (Diffley, 2012):

- Know what your customers value
- Assure quality
- Work from your strengths and competitive advantages
- Stay in the market and never break a pattern of delivery
- Tell the same story consistently with your delivery person, label, quality, pack, point of purchase cards and attitude
- Engage in production planning to assure predictable supply

Clearly, there is a relationship between the selling price and the volume that can be sold at that price. For farmers, pricing is often a question of matching the price to the volume that the farmer wishes to produce, according to Diffley. Food hubs may have more flexibility than farmers on the volume of products they offer, but still follow the same principle. If selling to a customer who resells product, such as a retail grocery store, it may be appropriate to ask how much of a product they will be able to sell at different prices as part of a price negotiation.

Understanding the marketplace is also key to price negotiation, according to some of our interviews. USDA Agricultural Marketing Service regularly publishes market prices for edible commodities on their Market News website (USDA, 2016). The most common reference points for produce prices are the terminal markets, which are large public exchanges located at major transportation hubs across the country. USDA's terminal market price reports cover both conventional and USDA Certified Organic items. USDA also posts prices on local and regional food, collected from major farmers markets and other locations.

Most food hubs seem to want to avoid "the price game" of closely tethering their prices to the fluctuating national market. However, Red Tomato, a large food hub based in Massachusetts, uses terminal market prices as a tool to understand how their price points are likely to compare to conventional wholesale. According to Executive Director Laura Edwards Orr, knowing the market price allows the food hub to recognize in advance if their suppliers' prices are significantly higher or lower than the market price. They constantly review market prices and forecasts for the season. This gives them a chance to share their concerns with growers, and if necessary, to gather talking points about the attributes of a particular product so that they can explain or negotiate a higher price to customers. This prevents them from being

caught off-guard in price negotiations when they make their sales calls (Edwards-Orr & Futrell, 2016).

Working with farmers. Food hubs often struggle to offer a “fair” price to farmers when selling in competitive markets. However, Michael Rozyne of Red Tomato argues that there are many ways to offer “a good deal” to farmers in ways that go beyond price (Rozyne & Hodges, 2012).

These include:

- **Volume:** Being able to sell a large and consistent volume, but also to match the right grower to the customer so that their price and volume expectations align;
- **Planning:** Helping farmers plan their production so that they can fit their volume to the demand without having excess capacity;
- **Long-term relationships:** Creating a feedback loop with customers so that growers have the chance to improve, which helps with customer retention;
- **Efficient logistics:** Saving growers money on distribution via shared trucking, backhauls, and full pallets;
- **Fast, reliable payment:** This benefits farmers’ cash flow which can be a big need, especially for farmers selling to wholesale channels only;
- **Ability to move the whole crop -- all sizes, all grades:** Finding alternative markets that maximize the value of small and cosmetically imperfect products; and
- **Quality of relationship:** Providing reliability, trust, dignity and market intelligence, reducing farmers’ stress and risk.

When food hubs offer farmers “a good deal” that helps them move more products, gain critical information about the marketplace, reduce waste and excess, and speed up cash flow, farmers may be in a position to be more flexible on prices.

In general, farmers selling large volumes of products may have more flexibility around price, while small farmers may require a higher price to be viable. Rather than standardizing prices, Red Tomato builds supply chains that match farmers to the right type and volume of customers so that each farmer can earn the price he or she needs to be profitable. To this end, the food hub provides customized ordering guides to different customers depending on the type of customer, specific products and the volume of product they purchase. As a result, the food hub may end up paying different farmers different prices on the same day for the same product – but this suits their mission and also helps them capture the margins they need. Red Tomato is always transparent with growers about price negotiations and the prices they are charging their customers (Edwards-Orr & Futrell, 2016).

Similar to Red Tomato, Common Market in Philadelphia works closely with farmers on pricing. Common Market’s Haile Johnston explains that they provide guidance to farmers on what they think the market will bear, but essentially allow farmers to set their own prices and to test how well different prices will work. To these prices Common Market adds a flexible markup of 15-35% that depends on the product, time of year, and their relationships with the market segment in question (Johnston, 2014).

Some managers feel strongly about the importance of flexible gross margins, because they allow food hubs to take advantage of favorable market variations in price. In some cases, especially during the height of the growing season, the asking price of local farmers can turn out to be much lower than the prices offered by national distributors. This can happen routinely, or

for special reasons such as droughts in California or fluctuations in fuel prices. Flexible pricing and margins allow the food hub to retain at least some of the profit from these windfall price advantages before passing the rest on to farmers or customers. An inflexible pricing scheme, based on a fixed margin and average farmers market prices rather than seasonal wholesale prices, was cited as one reason for the unprofitability and eventual closure of Grasshoppers Distribution food hub in Kentucky (Brislen, Woods, Meyer, & Routt, 2015).

5.7 Employee Turnover and Compensation

Employee turnover and compensation are closely tied to labor efficiency issues, and several of the managers we interviewed expressed frustration with staff turnover. Furthermore, according to the 2014 Food Hub Benchmarking Survey, the 25% of food hubs with the highest profits spent 3% less of their revenue on labor than the average food hub, but paid workers 39% more per FTE (NGFN Food Hub Collaboration, 2015). Such findings highlight the importance of investing in and retaining skilled staff. However, in our analysis of wages and salaries accepted by food hub staff in our case studies, we found that staff at all levels were accepting compensation well below the “market” rates for comparable positions in wholesale and distribution. In our interviews, food hub managers expressed interest in strategies for benchmarking appropriate wages and salaries. Several managers also mentioned staff turnover as an operational challenge that might be decreasing their labor efficiency. So, this section explores reasons for turnover, the role of compensation in labor productivity, and resources for benchmarking compensation.

5.7.1 Staff Turnover

Staff turnover can cost 20% of an employee's annual salary to replace an employee who leaves (ExtenData and International Telematics, 2014). It also affects customer relationships.

The case study on the collapse of Grasshopper Distribution concluded that "staff turnover, combined with frequent changes to the business model and underdeveloped supply-side expertise and infrastructure, resulted in management and quality control issues that affected customers' relationships and overall performance of the enterprise" (Brislen, Woods, Meyer, & Routt, 2015). Furthermore, turnover can reduce efficiency, lower morale, and make it difficult to build a culture around organizational values.

In a review of published research on staff turnover, Porter & Steers (1973), identified the following significant predictors of turnover:

1. **Whether initial expectations for the job are met;** for example, to what degree was the job situation accurately described at time of hire
2. **Compensation level,** including:
 - Adequacy for meeting income needs
 - Whether compensation is perceived to be a fair reward for effort
 - Whether the promotional scheme is seen as equitable
3. **Likelihood of promotion** or increase in pay, even if expected increase is small
4. **Satisfaction with supervisor relations,** including:
 - Perceptions of equitable or inequitable treatment
 - Whether employee needs for recognition and feedback are met

5. **Quality of peer relationships on the job**, including:

- Participation in a cohort of other trainees upon hire
- Inclusion and cohesiveness among peers
- Equity of social aspects of the job

6. **Satisfaction with the job content**, including:

- Are the job tasks too repetitive
- Is there enough autonomy and responsibility
- How does the level of clarity about job roles compare to a given employee's need for clarity, which varies among individuals

As noted, compensation is only one of many factors in whether employees stay with a business. Food hubs may be able to recruit and retain skilled staff by providing a positive peer atmosphere, empowering staff to make decisions, offering opportunities for advancement, and providing strong job satisfaction. However, compensation also has social responsibility implications for a values-based business such as a food hub, and plays a role in productivity as well as turnover.

5.7.2 Compensation and Productivity

Zeynep Ton, an MIT professor who researches the staffing strategies of retailers, has documented many instances where cutting staff or paying low wages hurt retailer profitability. Reasons include impacts on staff morale, customer service quality, and staff efficacy in making stocking decisions or other judgment calls that impact sales. Ton cautions against using the Labor to Sales Ratio alone as a tool for determining ideal staffing levels, as this tends to lead to cuts in payroll. Instead, she recommends that stores improve labor efficiency by reducing the

number of product offerings and special promotions, cross-training employees for various tasks, timing and standardizing tasks, and giving employees the freedom to make small decisions. One example of a store that uses these strategies is Costco, which pays employees 40% more than its chief competitor Sam's Club and enjoys almost twice the sales per square foot (Ton Z. , 2012). To determine optimal staffing levels, Ton recommends tracking performance on tasks that are the most likely to suffer from insufficient labor, and adjusting accordingly (Ton Z. , 2008).

While these suggestions are aimed at retail stores, they could have relevance for food hubs as well. For a food hub that adapts its marketing strategies, employee roles and process efficiency to increase Sales per Worker Equivalent and Margin Minus Labor, the associated cost savings could make it more affordable to raise worker pay, which in turn could pay off with more efficiencies in the long run.

5.7.3 Benchmarking Wages and Salaries

Food hub managers often express curiosity about the wages and salaries that other food hubs are paying. However, our case studies suggest that food hubs tend to greatly undervalue their personnel. So instead of giving examples of actual food hubs' compensation rates, we offer suggestions of alternative ways to benchmark staff compensation.

For guidance on appropriate pay for employees, Jesse Singerman, food business consultant for Prairie Ventures LLC, recommends the following sources (J. Singerman, personal communication, October 8, 2015).

- Local economic development entities that collect wage information from their business members
- Local chambers of commerce

- Newspaper advertisements or online job postings (be sure to look at job descriptions for similar positions, including positions at nonprofits or social enterprises, and how they are defined)

Additionally, social sector support organizations such as Third Sector New England sometimes collect regional compensation data for values-driven organizations.

The Federal Bureau of Labor Statistics calculates median wages and salaries for all kinds of job descriptions nationwide (Bureau of Labor Statistics, 2015). A search of the Bureau of Labor Statistics (BLS) National Compensation Survey data can be conducted for a particular state and region at <http://www.bls.gov/ncs/home.htm>. Median hourly wages and salaries can be searched through the “multi-screen data search” feature on the site, or by downloading Excel spreadsheets for a given state or metropolitan region. To search for wages only from the food wholesale industry, use NAICS code 424400: “Grocery and Related Product Merchant Wholesalers”.

Median wages for the following occupational categories may be of special interest:

13-1921 Buyers and Purchasing Agents, Farm Products
41-0000 Sales and Related Occupations
43-4051 Customer Service Representatives
53-0000 Transportation and Material Moving Occupations
53-3033 Light Truck or Delivery Services Drivers
53-7062 Laborers & Freight, Stock, and Material Movers, Hand
53-7064 Packers and Packagers, Hand

We have not found BLS median wages and salaries for managerial positions to be very useful, because they reflect pay rates from larger for-profit companies that mostly do not reflect a social mission. From a mission-driven standpoint, it may be both unrealistic and undesirable for food hubs to pay their managers the same salaries as top-level staff at a \$15 million wholesale

distribution company. However, BLS figures do reinforce the need to offer a good package (including job satisfaction, a connection to values, and other non-monetary benefits) for employees who could be making more money elsewhere.

On the other hand, BLS median wages for positions in lower pay brackets, such as packers, drivers, and the other occupational categories listed above, may be helpful in understanding what wages are competitive in the local labor market. Wage-labor jobs probably bear the least resemblance to nonprofit jobs in the degree to which employees are able to sacrifice potential income to become part of a social mission.

Benefits are another consideration. Some food hubs make use of contracted workers and avoid offering health, vacation, dental or retirement benefits to employees. For retention, such benefits are highly recommended. In addition, consider creative, low-cost ways to reward employees. For example, one food hub we interviewed offers an annual \$400 “Professional Development stipend” for employees to attend food-related classes or conferences of their choosing.

5.8 Managing inventory

Inventory management has implications for food hub financial performance, both on paper and in reality. In our study, we observed how limited information about inventory at three of the four food hubs inhibited our ability to evaluate them. The case of Food Hub 4 also hinted at the cash flow implications of holding inventory for long periods. This section explores the importance of inventory management, approaches to setting up an inventory management system, and the costs of holding inventory items.

5.8.1 The Importance of Inventory in Financial Metrics

Food hubs that specialize in highly perishable products tend not to invest time and money in inventory tracking systems at the outset, which makes sense when their products turn over almost immediately. If inventory is being held for more than a few days, though, it is worth tracking for several reasons:

- **Efficiency:** Calculating Days in Inventory or Inventory Turnover make it possible to track how efficiently the food hub is moving its products and using its warehouse space.
- **Cash Flow:** Since inventory turns are part of the cycle of converting Costs of Goods Sold into cash, knowing Days in Inventory (together with Days Receivable and Days Payable) allows the food hub to see how quickly sales are being converted into cash for the business.
- **Accurate Valuation of Assets:** Tracking inventory allows it to be listed as an asset, which improves the hub's liquidity and solvency measures. Even if products are turning over very quickly, a large portion of current assets may be sitting in inventory at any given time.

Kate Danaher of RSF Social Finance says that she has seen inaccurate information about the value of inventory lead to problems for food hubs, especially those that engage in or pay for processing (personal communication, December 4, 2015). The valuation of each unit of inventory should reflect the Cost of Goods Sold for that product, which for processors includes the per-unit costs of processing. For example, suppose a food hub purchases a steer, has it processed, and places all the cuts of meat in a freezer to sell them separately. In the valuation of

this inventory, processing costs should ideally be divided across all of the cuts of meat according to their weight; this is complicated because prices per pound probably differ for each cut.

Such precise tracking may not always be possible, but managers should be aware that small discrepancies over time can lead to large cumulative discrepancies in the valuation of their inventory. Danaher suggests that managers revisit and reconcile their inventory valuation periodically, for example every quarter, so that discrepancies don't pile up. Otherwise, overstatements of inventory value eventually become unexpected write-offs that dig into the food hub's margins.

5.8.2 Choosing an Inventory Management Solution

Implementing inventory management involves more than just purchasing software. Successful inventory management requires some kind of informational gatekeeper to actively make sure inventory information is kept up to date. The gatekeeper can be an automated technology solution, a staff person, or both (C. Krejci, personal communication, Feb. 16, 2016).

If the gatekeeper is a technology solution, that solution should provide standard procedures for logging items into and out of inventory, should be straightforward enough for multiple staff to use, and should make it difficult for people to bypass the system. (For large wholesalers, such systems usually involve handheld barcode scanners, which feed inventory adjustments directly into a computer system.) Staff who use the system must be trained to respect the importance of following standard procedures so that data is kept up to date.

If the gatekeeper is a person, they become the "funnel" through which all inventory-related information will pass. The recordkeeping system itself could be simple, since only one person needs to use it. It could be an Excel spreadsheet, a Google form or the inventory feature

of Quickbooks. The gatekeeper must take full responsibility for making inventory updates, and work systematically to make sure all information is correct.

Most hubs seem to start tracking inventory using Excel or the basic inventory functions of Quickbooks Professional. Quickbooks, however, is not ideally set up to manage a warehouse. Depending on the hub's needs, a more advanced solution may or may not be required later on. Large distribution companies typically purchase inventory management capabilities as part of an *Enterprise Resources Planning (ERP)* software solution. ERP software collects, stores and interprets data from many activities including inventory, planning, marketing, shipping and more. One helpful thing about ERP systems is that they can automatically trigger reordering of inventory items when stock is reduced to a certain level. They are also built to interact directly with financial recordkeeping so that financial statements will reflect accurate inventory valuations.

Some businesses choose to purchase an already-designed ERP package, while others have one custom-designed for their needs. Examples of ERP systems designed for food distributors include Edible Software, FoodConnex, and Produce Pro. Other ERP systems are specifically designed for food hubs. Examples of food hub ERPs that advertise inventory management capabilities include Delivery Biz Pro and Local Orbit.

New Venture Advisors, a consulting company that helps food hubs select technology solutions, offers the following framework to help food hubs evaluate the inventory capabilities of potential software solutions:

- **Silver (good):** Inventory services are optimal for "just in time" and are largely grower-level. Minimal functionality that allows hub to view products that are owned by the hub and part of the hub's supply chain.

- **Gold (better):** Tracks in-house inventory by "ordered, received, in warehouse, booked, etc." and tracks shelf-life and aging.
- **Platinum (best):** Includes produce specific characteristics, such as recognizing shelf-life/aging as unique from "received date". (New Venture Advisors, 2014):

Food hubs are advised to look carefully at solutions before selecting one, as the costs of switching systems are usually significant.

5.8.3 True Costs of Inventory

Sometimes inventory items such as frozen products or value-added goods have a higher gross margin than highly perishable items. Given the limitations of the growing season, a food hub may have good reason to stock up on large quantities of high-margin inventory items while they are available. However, it's important to remember that holding inventory can be costly. Inventory *holding costs* include (Rushton, Croucher, & Baker, 2006, p. 204):

- *Risk cost:* Costs from deterioration of products (shrinkage), theft, or damage while items are in inventory. This cost is very important for food purveyors and is often underestimated.
- *Capital cost:* The "opportunity cost" of tying up capital in inventory that could otherwise be invested elsewhere or used to cash-flow the operation. For example, if holding inventory requires obtaining an operating loan to replace the cash invested in inventory, then the interest on the loan will be a capital cost.
- *Service cost:* The cost of managing inventory stock and insuring its value.
- *Storage cost:* The cost of warehouse space and handling during storage.

Total holding costs can be found by adding up the four cost categories above. (Finding storage costs per unit is tricky if one already has a fixed amount of storage; it may or may not make sense to include these. Risk and capital costs per unit are a bit easier to calculate.)

If one knows the Days in Inventory per unit of a particular product, this can be multiplied by daily holding costs to get a rough idea how much it costs to hold each unit of product before it is sold. By subtracting this and other variable costs from the gross margin of an inventoried product, it is possible to see how the inventoried product compares to other products in terms of profitability.

Although inventory incurs costs, it can also reduce costs. Keeping more items in inventory can reduce *ordering costs*, or costs of procuring more product, and *shortage costs*, which represent the missed opportunity of not being able to fill orders if inventory runs out.

Many theories of supply chain management address how to balance the risks of shortage against the costs of holding inventory. Conventional manufacturers, retailers and wholesalers typically calculate the *economic order quantity (EOQ)*, the optimal amount of product that they should order at a given time in order to minimize the sum of holding costs and ordering costs.

The formula for EOQ is as follows (Homa, 2016):

$$EOQ = \sqrt{\frac{2 * \text{cost per order } (\$) * \text{annual demand (units)}}{\text{holding cost per unit } (\$)}}$$

Where holding cost per unit = holding cost (%) * cost per unit (\$)

A more complex version of this model is used in ERP systems to determine optimal order size and the level of stock that should trigger an order to replenish inventory. The latter calculation also considers *lead time*, or the amount of time between when the firm places an order and receives the order.

The EOQ concept may be less applicable to businesses that procure highly seasonal products or that pre-sell or broker items. However, it is relevant for businesses that purchase and hold inventory items, such as frozen or value-added goods, throughout the year.

5.9 Equity and Sources of Financing

In a finance presentation at the 2012 National Food Hub Conference, lenders urged food hubs to “guard equity jealously” and to set a timeline of goals for building equity (NGFN Food Hub Collaboration, 2012). This is because all businesses must increase their equity in order to grow sustainably, and they must have their own money in order to borrow money. Even if the firm rents its equipment and owns few physical assets, as sales increase it will still need an increasing amount of working capital to operate. If equity does not grow in tandem with the firm, the firm will need to borrow more, and over time it could become highly leveraged. It could eventually lose the ability to borrow, and could become insolvent.

Food hubs can increase their equity in one of three ways:

1. Profitability from operations;
2. Infusions of capital from charitable funders, if the food hub is eligible, and
3. Contributed capital from owners, co-op members and/or investors.

Compared with debt financing (e.g. loans and credit), equity financing from investors has several advantages. In some ways it is less risky than a loan because it does not have to be paid back on a certain schedule, and there are no regular loan payments to detract from available working capital. Investors usually do not expect an immediate return on their investment. The initial value of the investment does not have to be paid back if the business goes bankrupt, although some investors may have preferred access to liquidated assets.

On the other hand, investors may ultimately require a rate of return larger than the interest that would be paid on a loan. Also, taking on investors involves giving up some control of the business. For a business that is strongly mission-driven, investor control has the potential to pull the enterprise away from its founders' mission.

Some food hub service providers believe that traditional equity financing is too awkward of a fit for food hubs (K. Danaher, personal communication, December 4, 2015). According to the Food Hub Benchmarking Study, the average hub experiences negative profit (NGFN Food Hub Collaboration, 2015). A "typical" investor will be looking for a larger return on investment than a "typical" food hub can offer. Of course, there are atypical investors who are more patient with their capital, and there are atypical food hubs that can offer a more appealing ROI.

Established, growing food hub businesses may wish to explore hybrid models of debt and equity financing, such as *mezzanine financing*. Examples include *subordinated debt*, *royalty financing*, and *warrants*. These provide alternatives to traditional debt financing, but typically involve less loss of control of the business than equity financing (Vermont Sustainable Jobs Fund, 2016). Food hubs should not be afraid to seek capital, but should be cautious of risks and tradeoffs when deciding how to finance themselves.

In this chapter we have explored recommendations for how food hub managers can take action on problems identified in their financial metrics. The next and final chapter summarizes the findings of the study as well as our recommendations.

CHAPTER 6

CONCLUSION

6.1 Summary of Findings

This comparative case study has explored what key financial metrics and financial analysis can tell us about food hubs, and how financial analysis can be used by managers to make improvements in their businesses. We have proposed a “dashboard” of key metrics for use by food hub managers, most of which we were able to utilize in our four case studies of food hubs. In our analysis, we observed that the study hubs faced working capital constraints, labor efficiency concerns, high debt-asset ratios, and challenges with profitability. Firm age had a large impact on labor costs, operating costs, and ultimately profitability. While some food hubs broke even at levels below \$1 million in sales, none were able to achieve positive profit in all years, even at sales levels well above \$1 million, suggesting that all the hubs in the \$500,000-\$2.5 million sales range were still in a “breakeven” phase of growth. Grant funding helped support food hub expenses, sometimes offsetting negative profits, but did not play a major role for three out of four hubs. Grants may have assisted with cash flow, although this was difficult to show using our data.

We also observed some general characteristics across the four food hub businesses. They tended to own few long-term assets relative to current assets. They tended to use current liabilities as sources of financing, more so than other wholesale businesses, and made heavy use of interest-free sources of credit. Modest owner equity and small total asset size left each firm vulnerable to insolvency in years of negative profit, and variations in current assets had a large impact on solvency. However, probably because of bootstrapping techniques, including renting

and sharing equipment, the food hubs were usually more efficient in using their assets than the businesses reflected in benchmarks.

Industry benchmarks turned out to provide a useful basis of comparison for Days Receivable, Labor to Sales Ratio, Gross Margin, and possibly Sales per Worker Equivalent, although these measures also needed to be analyzed within the context of each food hub's own operating expenses and profitability. We have discussed some reasons why the Sales per Worker Equivalent benchmark may not have been accurate. Benchmarks were a bit less helpful for evaluating Days Payable, Days in Inventory, Asset Turnover and Return on Assets because of the differences between food hub and conventional industries and the unique nature of each hub's business model. These latter measures were more useful for evaluating each business' performance against itself over time (trend analysis) and could also be useful to compare to internal targets (budget analysis). Food hubs' recordkeeping decisions, especially regarding depreciation and whether to track inventory, had a large impact on most of the measures. Such decisions must be taken into consideration when conducting financial analysis, and adjustments may be needed.

Finally, literature reviews and interviews regarding common problems faced by food hubs revealed practical actions that managers can take to improve their metrics. For example, strategies to improve cash flow include cash flow budgeting, careful management of Accounts Receivable, rapid inventory turnover, and obtaining a lines of credit. Gross margins can be improved by emphasizing higher-margin outlets and product lines and by carefully monitoring whether targets are being achieved. Price negotiation with farmers can be made more effective by meeting farmers needs' other than price, including fast payment, market intelligence, marketing of seconds, production planning assistance, and reliability. Price negotiation with

customers is more effective when food hubs understand what their customers value, come to negotiations already knowing whether their prices are “low” or “high,” deliver reliable service, and match the right farmers with the right customers. Labor efficiency can be improved by instituting training, using standard operating procedures with shared goals and objectives, and reducing staff turnover. This may require looking closely at the work climate and the potentially damaging tradeoffs involved in paying staff at below-market rates. Solvency can be improved by selling off unproductive assets or by securing charitable funding for investments in fixed assets. Food hubs are advised to create a plan for building equity over time as their business grows, and to carefully consider the tradeoffs involved in different sources of capital, including investor equity and mezzanine financing. These recommendations, also reflected in our *Managers’ Guide to Food Hub Financial Metrics*, will hopefully help food hub managers to take action after analyzing their businesses.

6.2 Limitations of the Study

Probably the largest limitation of our study was our inability to secure monthly financial statements and balance sheets. The balance sheets we received from food hubs were all dated December 31, meaning that they told us nothing about seasonal cycles in current assets and current liabilities. Similarly, the income statements all reflected an entire year’s worth of sales and did not allow analysis of sales in individual months or quarters. It is reasonable to expect that food hub financial statements would look drastically different at different times of year along with variations in seasonal food sales and inventory stocks. In the “real world,” measures such as Days Payable and Receivable are most useful for managerial decision-making when calculated based on weekly or monthly figures, but we could not replicate that situation in our

metrics. We also could not compare high-season and low-season values for measures that depend on seasonally variable figures.

The difficulty in obtaining feedback from case study hubs was another limitation. In the process of doing our analyses, we provided 20-25 page reports and tables of key metrics to each of the case study hubs and requested feedback on whether our analyses made sense. Food Hub Managers are busy people, though, and while all of the food hub managers confirmed receipt of their reports, we only received substantive feedback from one manager. This limited our ability to learn whether there was wrong or unhelpful information in our analyses. To confirm that we were not too far off-track, we did secure some feedback on our *Managers' Guide to Food Hub Financial Metrics* from two other food hub managers unrelated to the study. However, due to confidentiality issues, they could not assist with our individual financial analyses. Among other things, our experience speaks to the potential inaccessibility of dense, number-heavy written reports for actively engaged managers. There are probably ways to more efficiently summarize and deliver financial information to food hubs, which we did not have time to explore. It also speaks to the possible value of providing stipends to research participants in exchange for their review of findings, which we were not able to do.

Finally, the small number and limited range of participants in our case studies were limitations. In conducting a comparative case study, we did not seek to calculate statistically significant numerical results or to treat our participants as a representative sample of all food hubs. Rather, we sought a deep exploration of four food hubs that varied in some key aspects: age, geographic location, business structure, brokerage vs. ownership models, and hybrid vs. wholesale-only marketing outlets. Given the limited time and funding available for the study, it made sense to study several “hybrid” (mixed wholesale and retail) food hubs since they offer the

opportunity to explore two different business models in one. Still, our comparison would have been strengthened by comparing at least one “retail-only” hub and perhaps additional “wholesale-only” cases against the food hubs already participating in our study. Since not all of the hybrid models in our study collected program-specific data for their wholesale and retail programs, incorporating retail-only hubs would have allowed a better comparison of the financial aspects of different business models.

6.3 Suggestions for Future Research

In general, there appears to be a need for more case studies that look specifically at the financial aspects of food hub businesses, and not just at the qualitative aspects of their business models. In previous studies some emphasis has been placed on the profitability or sales volume of particular food hub cases, but very little quantitative information exists on how food hubs capitalize themselves, manage cash flow, and draw profit from various aspects of their operations. We have attempted to help fill this void, but additional financial case studies of other food hubs would provide educational value and would help deepen the conversation. In particular, it would be helpful to see a financial case study that looks at changes in the financial position of food hubs throughout the fiscal year, identifying the different kinds of challenges (and opportunities) that arise at different times of year.

Additionally, there has been some inconsistency in the literature in defining and evaluating the so-called “viability” of food hub enterprises, and the methods used to do so have not always been easily replicable. In the author’s opinion, one practical way to resolve this would be to agree on a consistent methodology for food hub measurement and to create a common chart of accounts that could be used by food hub managers to do their recordkeeping

consistently with one another. Even better would be a centralized, web-based system that would collect food hub managers' data on an ongoing basis and confidentially report their own key metrics back to them, while also compiling benchmarks on a national scale. In one stroke this would solve the problem of delivering valuable self-evaluation information to managers while also efficiently calculating benchmarks, without having to manually request data from managers each year. Some efforts to explore creating or funding such a database have been made by the Wallace Center at Winrock International, and it would be helpful both to managers and to researchers if the idea were to move forward.

In terms of benchmarking, if future iterations of the national Food Hub Benchmarking Study are conducted, it would be useful to see more metrics calculated separately for different subgroups of participants: particularly wholesale, retail and hybrid models. Additionally, food hub managers appear to be interested in more operational benchmarks from other food hubs. Some of the metrics that managers have mentioned include inventory holding costs, revenue dollars per staff hour on the packing line, revenue dollars per distribution mile, variable costs per case, and customer retention rates. A first step towards such benchmarks might be to conduct another comparative case study similar to the present one, testing a “dashboard” of operational efficiency metrics on several example hubs.

On a more theoretical note, future research could continue our exploration of whether food hubs do in fact suffer from limited access to capital, or simply behave in a selective manner when accepting sources of capital. Such research could investigate how food hub managers access and evaluate different sources of capital, including institutional loans, grants, external investors, co-op members, and internal sources. Understanding how food hub managers think

about sources of capital might help lenders and other food hub supporters to better design financial instruments that could meet the needs of food hubs without jeopardizing their commitment to values.

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APPENDIX A

LETTER FROM INSTITUTIONAL REVIEW BOARD

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Institutional Review Board
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Vice President for Research
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Date: 11/11/2014

To: Savanna Lyons
209 Curtiss Hall

CC: Dr. Georgeanne Artz
478 Heady Hall

From: Office for Responsible Research

Project Title: Ratios and Benchmarks as Tools for Financial Management of Local Food Hubs: A
Comparative Case Study

We have reviewed the project noted above and determined that the project:

- Does not meet the definition of research according to federal regulations.
- Is research that does not involve human subjects according to federal regulations.

Accordingly, this project does not need IRB approval and you may proceed at any time. We do, however, urge you to protect the rights of your participants in the same ways you would if IRB approval were required. For example, best practices include informing participants that involvement in the project is voluntary and maintaining confidentiality as appropriate.

If you modify the project, we recommend communicating with the IRB staff to ensure that the modifications do not change this determination such that IRB approval is required.

APPENDIX B

CRITERIA TO PARTICIPATE IN THE STUDY

Screening criteria for initial set of interviewees:

- Regardless of business structure, must have a profit motive or a desire to break even
- Must have been in existence 3-11 years
- Must deal primarily with local food
- Must be selling at least some wholesale
- Must be actively marketing under a shared brand attached to the end product
- Must deal with product directly and be directly involved in meeting some kind of product standards, such as:
 - Grading
 - Quality inspection
 - GAP / HACCP or other food safety standard
 - Processing
 - Packing

Additional selection criteria for study participants:

- Must have reached breakeven or show evidence of moving toward breakeven
- Must keep good financial records and have at least 3 fiscal years of past records
- Geographic diversity
- Variation in business structures
- Willingness to collaborate on the study

APPENDIX C

FOOD HUB INTERVIEW TEMPLATE

Food Hub Name

Names of people interviewed

Locations visited

1. History

- a) Please give a general history of the food hub.

2. Marketing outlets – how they work

- a) How did you decide on the right mix of outlets? What are your goals for your mix of outlets?
- b) Describe each outlet, its % of your total sales, and how it works.

3. Distribution Systems

- a) How does your food travel from place to place?
- b) If you are using 3rd party trucking or collaborating with distribution companies, how does that work?
- c) What is your weekly schedule of accepting orders, filling them and delivering them?

4. Growth Since Inception / Profitability

- a) What are your annual revenues?
- b) What were your revenues each year since you started? (How do these reflect your growth, good years and bad years, key decisions, etc.)
- c) Are you making a profit?
- i. ...after paying your workers and owners?

- ii. ...how much did owners get paid last year and how much was “sweat equity?”
- d) If you have not broken even, at what sales level do you think you will?

5. Pricing & Margins

- a) What are your average gross margins for your whole food hub, and for each of its outlets (e.g. wholesale, CSA)
- b) (What are our margins for each product line? E.g. meat, produce)
- c) How do you arrive at the price you will charge to customers?
- d) How do you arrive at the price you will pay to farmers?
- e) (Do all farmers receive the same price for the same item?)

6. Capital

- a) What were your sources of capital in the beginning?
- b) And since then?
- c) (Do you have investors? Why or why not?)

7. Technology

- a) Do you have a sales platform? Which one? How do you like it and why?
- b) Do you take orders online or over the phone?

8. Quickbooks™ & Accounting Systems

- a) What records do you look at regularly to manage costs and know whether you are operating efficiently?
- b) What challenges do you have in this area? What training or IT needs?
- c) How long have you been keeping detailed financial records with your current system?

9. Seasonality

- a) How is your cash flow in winter? How do you manage these changes?

10. Personnel and Management Team

- a) What are your staff positions and their responsibilities?
- b) Are all staff paid?
- c) (What are staff paid?)
- d) (Do you offer benefits?)

11. Equipment & Infrastructure

- a) What equipment do you use?
- b) (How did you decide whether to rent or own?)
- c) (What were your most challenging decisions about capital investments and why?)

12. Production planning / farmer relationships

- a) Do you meet with your farmers to do production planning? How does it work?

13. Traceability & Inventory

- a) What systems do you have for traceability? How integrated are they with your other systems (e.g Quickbooks™, marketing platform)
 - a. (Do you use SKU numbers? Do you track lot numbers?)
- b) Are your farmers and facility GAP certified? Do your buyers require this?
- c) Do you have a system for managing inventory?

14. Reflection and Future Plans

- a) What do you wish you'd known when you started managing a food hub?
- b) Who was most helpful with tools and training?
- c) What are your goals for the food hub?