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Agricultural Credit Market Segmentation and Creditor Profiles: A Conceptual Model

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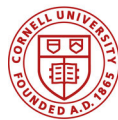
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Is Trade Credit Use Countercyclical? Evidence from the Northeast Dairy Industry *

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Abstract

Trade credit extended by feed manufacturers may be playing an important role for credit rationed farms during the current dairy sector downturn, but little is known about the volume and characteristics of trade credit in the agricultural sector. Through novel firm-level data collected from feed manufacturers that jointly represent about 80 percent of the total market, we estimate the volume of trade credit extended by northeastern United States feed manufacturers over the past decade. We also collect data on delinquencies and charge-offs by feed mills, which can be directly compared to commercial bank and Farm Credit System call reports and allow us to test hypotheses about credit rationing and the influence of regulatory differences between suppliers and lenders. We further use an unbalanced panel of dairy farm panel data from Cornell University Dairy Farm Business Summary to analyze changes to accounts payable and operating loan balances over high and low-milk price periods by different types of dairy farms, starting in 1993. In addition to evaluating the importance of trade credit for feed manufacturers and dairy farms alike during dairy sector downturns, this study will also allow us to contribute to a debate on whether the standard models on trade credit holds for a specific industry.

1 Introduction

U.S. farms have used input suppliers and other sources of nontraditional¹ credit for decades (Sherrick et al., 1994), and there is some evidence that use of nontraditional credit has been growing recently (Ifft et al., 2017), as agricultural credit markets become more segmented. Nontraditional credit may play an important role in financing during downturns, such as the financial stress currently facing the dairy industry. Following a milk price high in 2014, dairy farms have experienced milk prices below their cost of production at different points and for extended periods, depleting liquidity. This deficit leaves farms looking to supplement their current liquidity positions. One option is utilizing the trade credit terms offered by the feed manufacturers whom supply inputs. Trade credit typically has stated terms of payment not correlated with the milk price, trade credit may be relatively more attractive to dairy farms in need of liquidity during a downturn. (Nilsen, 2002).

Feed manufacturer’s success relies on maintaining or increasing the volume of feed supplied to farms Petersen and Rajan (1997). Despite assumed concerns regarding the current downturn, strategically, many feed manufacturers report having chosen to offer credit. Fur-

¹We define commercial banks, Farm Credit System lenders, credit unions and the Farm Service Agency as traditional lenders; other categories such as input suppliers and implement dealers are ‘nontraditional’

ther, in the case of a long-standing relationship with dairy farms, a feed manufacturer may be more lenient in the provision of trade credit Wilner (2000). In a sustained downturn, feed manufacturer become the only viable option for operating credit, especially if credit is rationed by traditional lenders. This raises the question of what happens during an extended downturn, were owed credit balance to become untenable. Feed manufacturers can become unintentional medium term creditors, or worse suffer losses should farm bankruptcies occur.

The purpose of this study is to gain understanding of the importance of trade credit to suppliers–feed manufacturers–and their customers–dairy farms. We will estimate the volume of trade credit for feed manufacturers in the northeast and compare lending performance relative to commercial banks and Farm Credit System lenders. We will complement novel feed industry data with a farm-level analysis of changes in operating loan balances and accounts payable over more than three decades. The methods developed in this study and results will provide novel information about trade credit in the dairy industry, as well as having implications for the broader farm economy.

Interest is growing in the role nontraditional lenders play in the agricultural credit market. Traditional lenders, including the Farm Credit System and commercial banks, have received significant attention from researchers throughout the years. Nontraditional lenders are defined as firms "whose primary contacts with producers historically have been for goods and services other than credit" (Sherrick et al., 1994). The agricultural credit market has experienced growth in nontraditional lending; for example, in 2013 agricultural machinery was 76 percent financed by equipment manufacturers Murfin and Pratt (2018). Ifft et al. (2017) find no observable difference in the financial characteristics of farms utilizing equipment dealer financing. Conversely Brewer et al. (2019), find when several creditors are present in a producer's operation, the presence of a nontraditional lender suggests they are financially less healthy. An analysis of the relationship between nontraditional lenders and banks suggests industry specific research is needed to understand the role each play Remolona et al. (1992).

Our analysis of trade credit within the northeast dairy industry allows us to test key

findings from the trade credit literature. Trade credit is one of the oldest forms of non-traditional lending, and in the case of the dairy industry is not tied to a durable good. In times of other credit constrictions firms use more trade credit (Meltzer, 1960; Petersen and Rajan, 1997; Cunat, 2006). Trade credit use is correlated with the nature of the good transacted: differentiated goods are more likely to be offered on trade credit Burkart and Ellingsen (2004). Some studies have postulated that because suppliers have superior information available, they are able assess credit risk or react more effectively than banks Smith (1987); Jain (2001); Biais and Gollier (1997); Petersen and Rajan (1994). In some industries trade credit is a tool to remain competitive with other suppliers Brennan et al. (1988); Chod et al. (2019); Fabbri and Klapper (2016). Conversely, Atanasova (2012) show empirically the relationship between bank finance and trade credit is clear in defining them as complements or substitutes.

Trade credit terms offered by northeastern feed manufacturers have higher effective interest rates than traditional bank credit. A dairy farm who is credit rationed by their traditional creditor, would have the option to realize more credit at a higher rate from the feed manufacturer. This raises questions about the differences between a bank's assessment of risk and regulations for making loans, and the common accounting practices and strategic business decisions of feed manufacturers. The literature which suggests trade credit is a tool in competitive markets, would assume a marketing value for trade credit. The availability of publicly available call reports will allow us to compare and contrast the costs of offering credit by banks and feed manufacturers.

Trade credit is an unsecured, non-real estate debt offered by nontraditional lenders. Very little is known about current practices and performance of trade credit in agriculture. Our regional, industry-specific approach is novel and will advance understanding of the role of nontraditional lenders in the agricultural credit market.

Farm Debt is a key financial indicator for the Agricultural Industry. A 2016 USDA report showed the growth of non real estate debt in the sector outpaced the growth in the real estate in the previous four years Patrick and Kuhns (2016). Trade credit should categorically be

included in this estimate, yet it is uncertain if there are accurate estimates to quantify the accumulation. We provide estimates of growth in the non real estate debt from a novel source. Our estimates can strengthen theories about the changes in farm debt through time.

An analysis of the trade credit extended by northeastern feed manufacturers to dairy farms through time will strengthen the theory of trade credit utilization in this specific industry. Using the industry wide and farm level dairy profitability measures, we will be able to test the theories presented in Meltzer (1960) on the countercyclical use of trade credit. We estimate a cost of trade credit using the feed manufacturer’s reported losses. Through additional empirical investigation, utilizing the Cornell Dairy Farm Business Summary, we are able to affirm trade credit theories with farm-level data.

We employ quarterly call reports, from the Farm Credit System and commercial banks to compare the losses, or the "charge offs" within the reported dairy feed manufacturers. The strong presence of Farm Credit East as a traditional agricultural lender in the Northeast, will allow us to do regional comparisons. John Deere Financial’s emergence as a national provider of agricultural operating loans will also provide a comparison for national non-real estate unsecured operating debt. Additionally, we establish an estimated excess demand for credit within the dairy industry, addressing the role of credit rationing within the agricultural credit market.

2 Background

Newman and Tita (2017) brought national interest in John Deere Financial’s increasing involvement in financing agriculture. John Deere Financial is the wholly owned subsidiary of the John Deere Corporation. The novel component to John Deere Financial’s activities is their election to become a Federal Savings Bank in 2012 and begin operation as a federally regulated bank. This allows them to accept deposits as well as continue in their previous lending capacity. One component of their lending business is an end user financing offered to agricultural input suppliers. Essentially, a agricultural input supplier purchases the opportunity for a customer to have access to credit. This credit is then used for the purchases of crop

inputs, machinery parts, livestock feed, etc, from the input supplier. This enterprise is in addition to the significant lending and leasing activities for John Deere produced machinery.

While John Deere Financial’s growth through the past eight years have been tremendous, it is not without oversight. As a Federal Savings Bank they are required to submit quarterly call reports to the Federal Financial Institutions Examination Council. John Deere Financial’s emergence in this credit market, has expanded farmer’s choices for operating credit. The growth of John Deere Financial’s activity as a agricultural operating debt provider is publicly reported quarterly in their federal call reports. Historically, Rabobank has engaged in similiar funding activities, again reported quarterly in their federal call reports. In light of the prevalence of federally-regulated lenders providing agricultural operating credit nationally, an evaluation of nontraditional lending truly supplied by an unregulated agricultural input provider becomes more difficult. Opportunities are limited to the USDA ARMS survey and industry data.

3 Methods

Our survey of feed manufacturers details an unregulated credit source from nontraditional lenders. The survey follows in the tradition of Meltzer (1960) and Petersen and Rajan (1997), with the focus on the accounts receivables and the volume of goods or services provided. Each feed manufacturer reports this information quarterly, along with the volume of accounts receivable considered overdue and lost or removed from the category. We match this with the charge-offs and delinquencies of the banking industry. The sales volume is also reported in the survey and we compare it to the volume of growth in the receivables during that period, creating a receivables to sales ratio. Due to the nature of agreements with the feed manufacturing participants, all values are reported as ratios, which provides anonymity while allowing us comparable metrics.

Dairy feed is typically manufactured to a customer’s specifications. These specifications are different between dairy farms, should a farm not pay for feed and the feed is repossessed by the manufacturer it will retain significantly less value to another farm customer. This is

inconsistent with theory suggesting suppliers have superior ability to repossess and resell the supplied goods Frank and Maksimovic (1998). This also reinforces the substitutability of the goods supplied. Further evaluation of feed suggests upon delivery to a farm, it is relatively illiquid. Upon the conversion of feed to milk, via the cows, the feed once again becomes liquid. This suggest the time value of trade credit, if allowed to persist into a medium term credit is not matched with the value. This mismatch of timing, and the manufacturer’s limited control on the now liquid milk (pun intended), illuminates a challenge for the feed manufacturers Burkart and Ellingsen (2004).

Feed purchased by dairy farms from feed manufacturers is by nature concentrated. This leads the Cornell Dairy Farm Business Summary to categorize them as ”feed grain and concentrates”. The volume of this feed is low as compared it’s value. This physical profile allows feed manufacturers to be competitive with other feed manufacturers with in a broad geographic area. The competitive market for dairy feed is another assumption we will place on our analysis. Fabbri and Klapper (2016), suggest the prevalence of trade credit as a feed manufacturing industry standard compels other feed manufacturers to offer trade credit. This may be an explanation for the feed manufacturer offering credit, even with knowledge of a liquidity depleting downturn in the industry. As reported by one of our industry contacts, “If you don’t offer me feed on credit, I will get the feed from your competitor who will.”

Dairy feed is also delivered periodically by feed manufacturers. We can assume the “points” of communication when an agent of the dairy farm and an agent of the feed manufacturer connect would be more often than an agent of a crediting bank. Unless a feed manufacturer asks for a detailed credit application they will have less quantitative understanding of a farm’s financial health. Therefore, they will need to look for alternative information on the likelihood of success of a farm. Personal relationships may be a mode of superior information with an ability to preempt a default. Additionally, this engages theories from Burkart and Ellingsen (2004), where a feed mill can rely on the necessity of their good, feed, as insurance of their payment ahead of other creditors. Cows do not stop eating, therefore the feed manufacturer is essential for the day to day operation, whereas a bank may be less

essential in the short term. We look for evidence of this in the Cornell Dairy Farm Business Summary.

The Cornell Dairy Farm Business Summary records the changes in accounts payable annually, by broad input categories. Our analysis utilizes accounts payable for "Feed Grain and Concentrates". This can be directly compared with accounts receivable growth within the feed manufacturers for an industry aggregated estimate. The aggregate estimate will qualify our assumptions trade credit is a useful financial tool for feed manufacturers and dairy farms during downturns.

The specificity of the category and data being recorded by firm annually allows us to analyze by individual farm characteristics. This analysis, motivated by the importance of trade credit, provides additional clarity to the concerns of credit constraints for farms. In the 2019 survey of feed manufacturers their industry specific credit terms are were disclosed. To maintain anonymity these terms are presented as the industry average. When the higher interest rates for trade credit are accepted by a dairy farm, by their choice to not pay the balance, they are signalling an additional demand for credit. Regardless of the other forms of credit present, this signal is an example of credit rationing. Following Biais and Gollier (1997) we use the Cornell Dairy Farm Business Summary to construct a simple metric of credit risk by firm, then compare the firm's account's payable as a measure of trade credit utilization. Calling once again the theory appearing in Meltzer (1960) a credit rationed firm will maintain larger balances of trade credit in periods of depressed prices. We estimate the volume of credit demanded above traditional lenders within the Cornell Dairy Farm Business Summary.

The Great Recession starting in 2007 has brought much more scrutiny to banking through the role of increased examination/regulation. Again, according to anecdote, some individuals in the feed manufacturing industry feel bank credit is constricted prior to the optimal time for constriction. The quarterly call report data of Farm Credit East and several prominent northeastern commercial banks with agricultural loans provide the volumes of loans delinquent or charged off in the period. Together with the charge offs of the feed manufacturers

during the last decade, we compare the losses within banking. This comparison raises the questions about bank regulations and how they are different than the strategic accounting or managerial decision to offer dairy farms trade credit.

A strategic business decision may include the future losses of offering trade credit. This unknown component of the growth of trade credit utilization is concerning for the larger question of farm debt growth. Upon default, some individual will be left with a loss. This loss could be in the strategic scope of the feed manufacturer's trade credit policy, but more likely is not. If there is evidence of leniency within the feed manufacturers trade credit practices, it suggests the growth of farm debt is underestimated. We estimate changes using the conclusions from farm level analysis of the Cornell Dairy Farm Business Summary and applying to larger estimates using the 2019 feed manufacturer's survey.

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