DETERMINANTS OF REPEAT CHAPTER 12 BANKRUPTCY FILINGS

by

MANISH SHARMA

(Under the Direction of William Secor)

ABSTRACT

The determinants of repeat Chapter 12 bankruptcy filings are assessed for the state of Georgia from 2008 to 2018. The probability of repeat filing is estimated using a logistic regression on the filer's financial characteristics, filing/procedural circumstances, and the economic conditions at the time of the filing. The US courts' PACER tool and FJC's IDB are utilized as the primary data sources for the formulation of unique datasets to classify and categorize future filings. The total liabilities, one-year lagged prime rate, and dismissal in the prior case are positively associated with the probability of repeat filing, whereas a negative association is observed with total assets, farm earnings, and the percentage change in employment. We conclude that the filer's financial, filing situation, and economic environment at the time of filing all contribute significantly to the occurrence of recurrent farm bankruptcy filings by the same entity.

INDEX WORDS: Farm bankruptcy, Agricultural finance, Chapter 12 bankruptcy, Farm finance

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TABLE OF CONTENTS

Page

LIST OF TABLES v

LIST OF FIGURES vi

CHAPTER

1. INTRODUCTION 1

2. LITERATURE REVIEW 7

    Existing Literature: 9

3. DATA 15

    Data Sources: 16
    Dependent variable: 19
    Independent variable: 23
    Restrictions: 25
    Summary Statistics: 28

4. METHODS 34

5. RESULTS 37

6. CONCLUSION 41

REFERENCES 46

LIST OF TABLES

Page

Table 1: Categorization of the disposition status..... 18

Table 2: Time to refile statistics in restricted and unrestricted datasets..... 20

Table 3: Independent variable data description with geographic level, frequency, and source 24

Table 4: Data filtering process 28

Table 5: Summary statistics of independent variables..... 31

Table 6: Summary statistics of repeat filers..... 32

Table 7: Summary statistics of non-repeat filers 33

Table 8: Coefficient estimates and average marginal effects, Logistic regression. 40

Table 9: Comparison of normal and robust standard errors. 40

LIST OF FIGURES

Page

Figure 1: Breakdown of first-time and repeat filings by year and time to refile 21

Figure 2: Yearly breakdown of time to refile by the years 23

Figure 3: Debt-to-asset distribution 26

CHAPTER 1

INTRODUCTION

Chapter 12 bankruptcy is a specialized bankruptcy code designed to help family farms and fishermen rearrange their debt and allow these firms to operate continuously during economic slumps and improve their overall resilience. However, the prevalence of repeat filing raises a critical question: Does Chapter 12 provide long-term solutions to struggling farms or just delay the imminent deeper financial difficulties? Chapter 12 bankruptcy was enacted as a temporary code in 1986 and later made permanent in 2005.

Since its inception, Chapter 12 bankruptcies have been used as a measure of the farm sector's financial stress (Dinterman et al., 2018; Stam & Dixon, 2004). Repeated bankruptcy filings signal that farmers are unable to resolve their financial challenges permanently. Chapter 12 bankruptcy filings rose 55% from 2023 to 2024, a trend that coincides with declining farm income in the last three years, suggesting a possible correlation between financial shortcomings and bankruptcy behavior (Ayoub, 2025). With national farm income projected to rise in 2025, we might believe this would lead to a turning point. However, this growth seemed to be driven by the increase in ad-hoc government payments, which are expected to rise 354% higher than in 2024 (Munch, 2025). While these payments may provide temporary relief to struggling farmers and delay new or repeat bankruptcy, they do not address the underlying financial challenges of heavily indebted farm enterprises, leaving the long-term problems unresolved. Hence, we must investigate the attributes of the farm that are consistently under financial distress and examine what factors are driving this.

This study provides a significant opportunity to further the understanding of factors influencing repeat farm bankruptcy filings. Furthermore, with the use of case disposition status in the prior case, the study provides inferential evidence on the effectiveness of Chapter 12 bankruptcy from the debtor's perspective. We formulate a unique dataset of repeat and non-repeat filers in the state of Georgia concerning the filers' financials, procedural aspects, and economic climate, which is a pioneering work on this topic. The existing literature from the economic or financial standpoint regarding Chapter 12 is scarce. Our work will add to the existing literature relating to Chapter 12 cost, policy evaluation, determinant factors for filing, and outcomes (Branch, 2002; Dinterman et al., 2017; B. Dixon, 2002; Wyche, 2021). Determining the cause of the repeat filing is an essential topic to assess the effectiveness of Chapter 12 bankruptcy and guide potential improvements. The findings from this study will expand our understanding of how bankruptcy policies can be refined to support American agriculture's resilience and sustainability.

Southern states account for 32% of the total Chapter 12 filings from the year 2014-2022, with Georgia leading the metrics with 19.5% of the cases filed among the southern states (Goeringer, 2023). Upon preliminary analysis of the previous filing variable provided by the Federal Judicial Court (FJC)'s Integrated Database (IDB), we find that 19.44% of the case filers in Georgia reported that they have previously filed for Chapter 12 bankruptcy. Although this metric does not accurately reflect the repeat filing due to the presence of connected cases, it still offers an important insight that motivates this research. The number of repeat filings in Georgia is 44, as per our initial data exploration and dataset formulation process. Dinterman et al. (2007) and Dixon et al. (2002) explore

the factors that cause farmers to file for bankruptcy. Wyche (2021) illustrates the factors that help farmers exit Chapter 12 in the state of Georgia. However, an investigation of the farms that are repeatedly filing for bankruptcy, signaling consistent financial distress, is yet to be explored. Our study helps fill this gap and highlights some of the factors responsible for the repeated filing and their impact.

Every Chapter 12 bankruptcy case might not accurately represent a farm due to the presence of connected, consolidated, and jointly administered cases. However, it remains a significant indicator of financial hardship for farms that have exhausted all their available resources to settle their debt and are in dire need of opportunities to retain their assets. As such, there is a need to understand why some of the farms are repeatedly under financial stress. We explore this issue by examining the characteristics of the farms that are repeat filers and those that are first-time filers. FJC's IDB and Public Access to Court Electronic Records (PACER) tools of the US Court system are the primary sources of data for this study. The economic controls are provided by the US Bureau of Economic Analysis, the US Federal Reserve Economic Data, and the US Department of Agriculture Census of Agriculture. With our data filtering technique, we end up with 227 observations, with 23 representing repeat filers and 204 representing non-repeat filers. The proportion of repeat filers and non-repeat filers remains somewhat similar after filtering, which highlights the consistency of our data filtering process. We employ binary logistic regression to examine the effect of selected explanatory variables on future filing. The explanatory variables are broadly categorized into three categories representing the filer's financial characteristics, filing circumstances, and economic climate at the time of filing.

The formulation of the dependent variable is a key step in our study. We use the PACER search document to retrieve case-level information for each case filed under Chapter 12 bankruptcy for Georgia from 2003-2020. The voluntary petition retrieved from the PACER search provides information regarding the previous filing within the last 8 years and any pending cases by the same entity. With this information, we traced back to the oldest filing available to us by the same repeat filing entity and assigned it to have a future filing. We do this as the financial knowledge and know-how between the first filing and the repeat filing are not the same, which might influence their capacity to follow through with the bankruptcy process (Loibl et al., 2006). Later, we supplement this data with the IDB database, which has case filer-related information. To reliably compare each unique case, we filter out related, pending cases, future cases of repeat filers, and open cases. This creates a dataset with complete information relating to the explanatory variables. Open cases are removed as the disposition status is being used as one of the explanatory variables in the model.

Using a binary logistic regression model, the binary dependent variable (future filing) is regressed on the explanatory variables broadly labeled as filer's characteristics, filing circumstances, and economic controls. The coefficient estimates, standard errors, goodness of fit, and marginal effects are presented for the interpretation and inference of our results. The coefficient estimate provides the direction of the explanatory variables, whereas the average marginal effect highlights the effect of a change in the independent variables on the likelihood of the future filing for a filer, *ceteris paribus*. We find that total liabilities, one-year lagged prime rate, and dismissal have a positive relationship with future filing. Additionally, we find a negative association between total assets, farm

earnings, and the change in employment rate with the likelihood of re-filing. From these results, we can infer that the filer's financial condition, general agricultural environment, procedural elements of bankruptcy, and macroeconomic characteristics at the filing are influential in determining the likelihood of repeat filing.

Through the data formation and cleaning efforts, a robust and complete dataset for the state of Georgia is created. While much of the data's reliability stands on the legitimacy of the information provided by the filers in the voluntary petition, the risk of endogeneity is eliminated, which could arise due to analysis of the cases filed by the same entity multiple times. The data is restricted to the first-time filing condition of both the repeat and non-repeat filers, and the event is characterized as a future filing dummy variable. Due to the rare nature of the occurrence of repeat filing and relatively small data, the logit model is considered a good estimator for our study. Furthermore, we present the robust standard errors in our model, which account for heteroskedasticity.

This study provides meaningful insights into the key factors distinguishing first-time and repeat filers; however, it is subject to certain limitations. One of the major limitations of this study would be the data. We must rely on the truthfulness of the filer while the voluntary petition for bankruptcy for our major source of data. The filer's characteristics consist of many missing values, which may limit the generalization and predictive ability of the model. Proper and complete data about some of the variables, such as average monthly income, discharged debt, and creation of a Chapter 12 plan, would have significantly enriched the analysis. Furthermore, much of the variation in the model remains unexplained by the selected explanatory variables. Moreover, the data is only

available up to 2020, which constrains the possibility of future filings for first-time filers beyond this point.

The remainder of this paper is structured as follows: Chapter 2 outlines the farm bankruptcy process and defines repeat filing. Furthermore, existing literature is also reviewed in this chapter. Chapter 3 reveals the data source and the dependent variable characterization process, and the model specification employed in this study. Furthermore, the summary statistics are presented in this section. Chapter 4 presents the rationale behind the selection of the model and the methodology. Chapter 5 provides the results of the analysis, i.e., marginal effects of the explanatory variable for our dependent variable and discusses the inferences and interpretations of the results. The final chapter concludes our study, acknowledges some of the limitations, and suggests directions for future research to explore farm bankruptcy.

CHAPTER 2

LITERATURE REVIEW

Chapter 12 bankruptcy started as a temporary measure to facilitate the family farmers and fishermen during the 1980s farm debt crisis. It was originally intended to be retired in 1996, but after several revisions stemming from the benefits and uniqueness of Chapter 12, it was made a permanent bankruptcy code in 2005. Chapter 12 allows family farmers and fishermen to navigate during tough economic hardship by allowing flexible debt restructuring opportunities and providing cramdown benefits. The cramdown benefit allows the farmers to reduce the value of secured debt to the market value, which is very helpful to farmers as they can adjust the value of their farm equipment in the event that these assets are worth less than the outstanding debt value (Anker, 2023). Chapter 12 borrows this feature from the succeeding chapter, i.e., Chapter 13. Chapter 13 is the provision intended for the consumer and consumer debt; thus has a lower debt limit compared to the farm bankruptcy code. It is also one of the most sought-after chapters by many during the financial turmoil, along with Chapter 7. Chapter 12 expands on the features of Chapter 13 while increasing the debt limit and allowing a flexible debt structuring process suitable for the seasonal nature of the agriculture and fishing industry.

A typical Chapter 12 bankruptcy case starts with a debtor filing a voluntary petition with the court in the area of operation or residence. Along with the petition, the debtor provides other important required documents, including schedules of assets, liabilities, income, expenditures, executory contracts, unexpired leases, and a statement of financial affairs. The debtor then pays a small filing fee, which, upon failure to pay, may lead to the dismissal of the case. The debtor also provides the full details of the creditors, the amount

owed, and the purpose the debt is taken, income details, property information, and a monthly breakdown of the farm's operating and living expenses.

Upon the filing of the petition, the automatic stay is triggered, and the creditors are notified of bankruptcy, restricting most of the collection activities from the creditors. A trustee is appointed, and a meeting is scheduled with the creditors within 21 to 35 days after the petition is filed. The debtor provides details about their financial affairs and proposes terms of their repayment plans during this meeting. Then, a confirmation hearing is held where the debtor's repayment plans are reviewed, which must be filed within 90 days of the petition, unless an extension is granted by the court. The repayment plan highlights the information about the fixed amount the debtor will pay to the trustee, who will distribute the payments to the creditors. The judge at the confirmation hearing decides whether the proposed repayment plan is feasible and within the standards of Chapter 12 bankruptcy. Upon confirmation of the repayment plan by the court, the debtor must obediently follow through to make the process successful.

If all obligations are made within the designated time and the plan is fulfilled correctly, the debtor receives discharge from the case. A discharge signifies that the debtor has completed all the required plan payments, is released from most debts covered in the plan, and is immune from the creditors' collection efforts. In other words, once discharged, the debtor is free from any debt obligations, whether the creditors are paid in full or part.

As refiling is an act of filing for bankruptcy again, we must explore why people file for bankruptcy in the first place. Farmers generally file for bankruptcy as a last resort when they can no longer afford to pay the debt from their operation. Assets of the filer are

protected in Chapter 12 by allowing restructuring of debt and renegotiation with the creditors. Different literature in other bankruptcy chapters explains that a refiling of bankruptcy by an entity can occur due to different reasons, such as unexpected expenses, such as medical bills or equipment restoration after the initial discharge, forestalling for foreclosure avoidance, failure to completely discharge the debt in the initial filing, and deteriorating market conditions (Domowitz & Sartain, 1999; Miller & Miller, 2008). Since Chapter 12 only requires 50% of the debt to be associated with the farming operation, the impact of the remaining source of debt should not be neglected (US Court). Therefore, similarities can be drawn between the refiling under other bankruptcy chapters and Chapter 12. Another feature of Chapter 12 is the automatic stay, which halts the creditors' collection efforts, foreclosure action, and repossessions. To stop the serial bankruptcy filing and prevent abuse of the automatic stay protection, the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005 introduced some changes. For instance, if a debtor files for another case within one year of dismissal, the automatic stay, which generally lasts until the disposition, is limited to 30 days, and for the second repeat within the same year, the debtor loses the benefit of the automatic stay unless proof of good faith is provided (Berger, 2023).

Existing Literature:

Dinterman & Katchova (2021) in their survival analysis of bankruptcy filings found that Chapter 12 cases have a longer duration to completion compared to other bankruptcy chapters. Furthermore, they observe that the completion time for chapter 12 has been trending upward while the time for completion for other chapters is on the decline. The author attributes the increase in the case disposition time to the higher debt level

associated with Chapter 12. Additionally, they find that the debt level for other chapters (except chapter 12) is stagnant over the year, while the debt level for chapter 12 is on the rise. Farming is a capital-intensive industry that requires significant upfront costs and substantial operating expenses. To make matters more complex, agriculture is also an industry where delayed revenue attributed to the longer production cycle is common. Hence, the inclusion of the total debts of the farm and the debt composition in relation to the secured debt in our model is essential to understanding the characterizing factor of repeat filers.

Dixon et al., (2002) examine the determining factor for Chapter 12 bankruptcy filings. They formulate a panel data comprising 48 states from 1987-2000. The study uses a double log-form fixed-effects model with one-year lagged independent variables to understand what factors influence the filing of farm bankruptcy. The author analyzes the determinants of Chapter 12 filing, incorporating economic and social factors. Dixon et. al. find that rising unemployment increases the filing rate, while a stable financial standing (e.g., higher net farm income and lower debt-to-asset ratio) has a decreasing effect on the filing rate. Also, they report that government payments reduce Chapter 12 filings. The author argues that, since both debtors and creditors anticipate these payments, their absence could both prevent and trigger bankruptcies by altering lending decisions. These findings highlight the importance of the general economic climate at the state level for influencing the Chapter 12 filing rate. Furthermore, it is also suggested that as Chapter 12 eligibility requires only 50% of the income in relation to farming operations, access to the urban city centers might prove as a financial safety net to struggling farms by providing off-farm employment. Social and demographic factors such as divorce rate and age of

the population were also investigated in this study; however, they found no significant relationship with the filing rate, further implying from the existing literature that though social factors play a crucial role in other bankruptcy chapters, they might not be influential for Chapter 12.

Wyche (2021) in his study of determinants of outcomes for Chapter 12 bankruptcy for the state of Georgia highlights the importance of the debtor-creditor relationship. The research employs limited dependent variable models to analyze how financial characteristics at the time of filing and general economic conditions influence the probability of different outcomes. Key findings from this study indicated that the higher property values at the time of filing and the larger total assets have a higher likelihood of negative outcomes, especially trustee dismissal. He argues that the creditors might have influenced the debtor to pursue the settlement outside of bankruptcy, causing a decrease in the likelihood of discharge. Wyche uses a unique method of data formation, leveraging the PACER search tool and FJC's IDB to formulate a unique set of dependent variables such as friendly dismissal, trustee dismissal, and discharge. The use of the court document (provided by the PACER search tool) and IDB is considered a robust approach for data collection and a synthesis method for Chapter 12 cases. Thus, similar methods are employed in our study to filter out the repeat filers and formulate the future filing dummy dependent variable.

Another important literature regarding Chapter 12 bankruptcy is the study by Dinterman, Katchova, and Harris (2017) that examines the factors that affect the financial stress on farms, with a focus on the impact of the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) on farm bankruptcies. Chapter 12 filings from 1997

to 2016 are used in this study as a proxy for the financial stress on farms. The findings highlight the role of the macroeconomic climate, policy changes, and agricultural land value in Chapter 12 filings. The study finds unemployment rate and interest rate as the major predictors of Chapter 12 bankruptcy before BAPCPA, but their impact diminishes after the implementation of BAPCPA. However, agricultural land value stands as a consistent predictor in the prior and post-BAPCPA adaptation. The research concludes that there might be a notable shift in the factors influencing farm bankruptcy, suggesting that the unemployment rate and interest rate are no longer a reliable set of predictors for Chapter 12 bankruptcy filing post-BAPCPA. The author also highlights the dynamic effect of agricultural land value, where the current year showcased a negative relationship, while the one-year lagged land value exhibits a positive relationship with the farm bankruptcy filing. It is suggested that the agricultural land value, which makes up a larger portion of the farm equity, could have a much more intricate relationship with the Chapter 12 filing. This provides a rationale for this study to include property value, which is the total of real estate and agricultural land value, in our model to understand its impact on long-term financial distress and recovery. Farmers with reduced equity value during economic downturns might repeatedly file for Chapter 12 to retain their assets through reorganization. This addition is crucial to understanding whether a change in property value influences the cycle of farm financial instability, leading the farmer to file for bankruptcy repeatedly.

Although there has been a great deal of study regarding repeat filing in other chapters, such as chapters 7 and 13, the examination of repeat filing in chapter 12 is still an unexplored topic (Robinson et al., 2024; Loibl et al., 2006). Miller & Miller (2008)

conducted a study with 489 Georgia participants to examine the differences between repeat filers and first-time Chapter 13 filers who were participants in a financial education workshop. Furthermore, they also delved into what factors contributed to the successful completion of the Chapter 13 repayment plan. They find that the repeat filers are much more likely to adopt better recommended financial management practices, such as establishing emergency funds, tracking expenses, and reducing discretionary spending, in comparison to their counterparts. Six of the seven recommended financial management practices were found to be likely related to the completion of Chapter 13 for the repeat filers, while only one, i.e., organizing financial records, was related to the higher likelihood of completion of the Chapter 13 plan. The author suggests that the act of filing repeatedly has created a situation of reformation and realization of deteriorated financial practices, thus repeat filers show better adoption of the recommended financial management. In other words, it is implied that the filing repeatedly made the repeat filers realize that this crisis might be related to deep-rooted financial mismanagement, and not the isolated incidents of misfortune. Hence, this compels repeat filers to re-evaluate their financial behavior and develop more disciplined habits. This study highlights the importance of controlling for the filer's knowledge of the bankruptcy proceedings and financial discipline, which might not be showcased by the first-time filers. Although the bankruptcy chapter under this study is different from our study, a similar situation is expected in Chapter 12.

Robinson et al. (2024) provides a comprehensive study on repeat consumer bankruptcy in Australia. This study is one of the major studies in repeat bankruptcy that utilized a survival analysis modelling approach to predict the time to refile. The study uses

153,526 voluntary business and non-business-related consecutive bankruptcies provided by the Australian Financial Security Authority (AFSA) from 2007-2021. A probabilistic linking method is employed in this study to distinguish unique filers due to the lack of a common identifier system in Australia, like the SSN used in the USA. The set of explanatory variables used in this study primarily consisted of socio-demographic factors and filer's characteristics such as age, business type, relationship status, employment, etc. The author finds that non-business individuals are more likely to have repeat filings compared to business-related individuals. However, the client's age, employment, and relationship status are found to be insignificant in distinguishing the business groups' repeat filing probability. This was found to be more prominent among the female non-business individuals, as they were more at risk of repeat bankruptcy compared to female business-related individuals. Although the bankruptcy chapter and set of explanatory variables differ from those in our study, the work of Robinson et al. (2024) provides an important methodological and theoretical foundation for our analysis.

CHAPTER 3

DATA

In this chapter, I introduce the various data characteristics and their sources that serve as the dataset for this study. Furthermore, the data cleaning process to obtain a workable dataset is explained, along with the characterization of repeat and non-repeat filers. This provides a guide to how I formulate the dummy variable, which delineates repeat filers from non-repeat filers. Also, the various explanatory variables used in this model, which are crucial for understanding the attributes associated with the repeat and non-repeat Chapter 12 filers, are explained. Two databases, i.e., FJC's IDB and US courts' PACER Search, are utilized for the creation of the unique dataset. Supplementing one database with another will enable the linkage with the connected and repeat cases while also conserving time and resources. Additionally, the explanatory variables are broadly categorized into three categories: filers' financial characteristics, filers' procedural or filing characteristics, and economic climate. The unique data wrangling process, coupled with the inclusion of these broad categories of the explanatory variable, provides a better representation and much cleaner data to feed into our model. A total of 227 observations are analyzed in the model, where 23 are repeat filers and 204 are non-repeat filers. We also examine the time to refile and refiling frequency relating to the repeat filers in accordance with the available initial filing years. The final part of this chapter consists of summary statistics for total observations, repeat filers, and non-repeat filers.

Data Sources:

The Public Access to Court Electronic Records (PACER) tool and Case Management/Electronic Case Files (CM/ECF) systems are used as primary sources of data for the analysis. The PACER search is a national search tool that provides information about every litigation happening in the courts. Each court is responsible for recording the litigation data, and the database is updated every night. This data is then transferred to the PACER case locator (PCL) from where details about every case can be accessed. The information provided in the documents available at PACER contains, but is not limited to, Schedules A through J, Statements of Financial Affairs, Final Decree, Creditor Matrix, Voluntary Petition, and other crucial information of the debtor and creditors.

The voluntary petition is of great importance as it is the basis for the formulation of the study dataset. The voluntary petition is an official document that a debtor files to initiate bankruptcy proceedings, along with some supporting documents. It contains various information, including the debtors' personal or business information, chapter selection, pending or previous bankruptcy cases, attorney information, as well as additional financial and legal data. The pending or previous bankruptcy cases section is the most important one. This section indicates whether the filer has a prior filing in the last 8 years, and the pending cases highlight whether this case filer has any other concurrent cases. This information is critical to the study, as this makes the link between cases of the same filer.

The PACER search documents contain a vast pool of information, but require manual efforts to go through every case to pull the filer's data. Due to the limited time and resources available for this study, the FJC's IDB database is used to supplement the

PACER data. The FJC compiles data from PACER and other federal courts and publishes the data through IDB for research and education purposes. The IDB contains information about the filers' financial information and other legalities but does not provide the previously filed case number. Hence, the PACER search is leveraged to gather information regarding previous filings and the case numbers, while relying on the IDB database for other related variables about the case files.

The case-specific financial characteristics are provided in the IDB database and on Schedules A through J in the PACER case files. Total assets, total liabilities, real property assets, and secured liabilities are provided in the IDB to represent the filers' financial standing at the time of filing. With this information available, the total liabilities and secured liabilities are utilized to formulate the secured liabilities share, which is the ratio of secured liabilities to total liabilities. This is done to understand the impact of the liabilities tied to the collateral on the likelihood of repeat filing. Furthermore, a real property share variable is created, which is the ratio of real property assets to the total assets. This represents the tied collateral value and might reflect the asset liquidity capacity of the firms. In general, the formulation of these proportions allows the model to better tease out the impact of debt composition and asset structure on repeat filing.

As a bankruptcy process is both a financial and a legal process, the addition of the legal variables or the procedural element in the model is of great significance. IDB provides the dummy variable for the legal factors, such as joint filing and the disposition status of the prior case. Table 1 shows the encoding provided by the IDB for different types of disposition. A categorical variable for disposition status is formulated, which

groups various disposition statuses into three categories: discharge, other forms of disposition, and dismissal.

Discharge	Other forms of Disposition	Dismissal
Standard Discharge (A)	Discharge Not Applicable(D)	Dismissed for Failure to Pay Filing Fee (H)
Hardship Discharge (B)	Discharge Denied (E)	Dismissed for Failure to File Information (I)
	Discharge Waived (F)	Dismissed for Abuse (J)
	Discharge Revoked (G)	Dismissed for Other Reason (K)
	Discharge Withheld for Failure to Submit Certification of Financial Management Course and Pay Domestic (N)	Dismissed for Failure to Make Plan Payments (T)
	Discharge Withheld for Failure to Submit Certification of Financial Management Course (O)	Dismissed for Failure to Pay Filing Fee and to File Information (U)
	Discharge Withheld for Failure to Comply with Domestic Support Obligation (P)	
	Homestead Exemption/Felony Conviction (R)	
	Discharge Withheld for Other Reasons (S)	

Table 1: Categorization of the disposition status

In addition to the filer characteristics and legal variables, the economic variables are also considered in the study. The data regarding pastureland share and government payments at the county level are extracted from the National Agricultural Statistics Service, USDA, to represent the agricultural environment in the filer's county. The percentage change in real GDP and the percentage change in total employment are sourced from the US Bureau of Economic Analysis (BEA).

Dependent variable:

A dummy variable representing repeat and non-repeat filings is used in the model. The creation and data filtering process plays a great role in our efforts for effective modeling. As stated earlier, the data regarding the repeat and non-repeat was gathered from the PACER document, particularly the voluntary petition B101 form. The debtor is asked to list if they had filed a case within the last 8 years, and if they have had a case previously filed, then they provide the information regarding the district, time of filing, and case number. This information is then used to create a dataset where a case number link is established; as such, a current case number corresponds to the previous case number.

With this information, the dependent variable, which represents the future filing, is formulated, i.e., the initial cases are coded as “1” if they had future filing, and “0” for the cases with no repeat filing. This helps to segregate the repeat filers from non-repeat filers. The oldest filing by the repeat filer is considered for comparison to the non-repeat filer. However, the FJC’ IDB started to publish the case data effectively from 2008; hence, 2008 was used as the start year in the model. Grabbing the initial filing of the repeat filers and non-repeat filers ensures that the knowledge gap between a repeat filer and a non-repeat filer is controlled. In other words, this method tries to make the comparison as equitable as possible by comparing the first-time filing of the repeat and non-repeat filers.

Although the time to refile is not considered in the model, it provides insights regarding the repeat filing interval. The restricted and unrestricted columns in Table 2 represent the model and the population dataset. The origin of the restricted model stems from the use of filters and the unavailability of complete data for every filing. In the unrestricted set, the average time to file is found to be 2.045 years or around 24.57 months, while the average time to refile for the restricted dataset is about 2.174 years or

27.44 months. The large standard deviation exhibited in both the restricted and unrestricted sets indicates that there is wider variability in time to refile among the debtors, suggesting that some debtors refile quickly while others delay their refiling for several years.

	Unrestricted		Restricted	
	Year to refile	Month to refile	Year to refile	Month to refile
Observations	44	44	23	23
Mean	2.045	24.568	2.174	27.435
Std. Dev.	1.493	18.188	1.642	19.242
Min	0	2	0	4
Max	5	67	5	67

Table 2: Time to refile statistics in restricted and unrestricted datasets

Figure 1 illustrates the prevalence of repeat filing by the filing year, which is further categorized based on the time the filer takes to refile. There are no repeat Chapter 12 filings when the cases were filed in 2013, 2015, and 2017. The higher first-time filing in 2010 and 2009 may indicate the worsening economic condition in the aftermath of the 2008 crisis. The comparatively substantial repeat filing in 2009 and 2011 paints a similar story, where the debtors were not able to follow through with their Chapter 12 plan or fully discharge their debts due to the bad economy. Among the years investigated, 2011 recorded the highest number of Chapter 12 repeat filings, while 2010 had the highest number of Chapter 12 filings. The inconsistency in the repeat filing after the 2012 farm sales boom highlights the importance of the farm's financial standing. This inconsistency and the lower number of repeat filings in comparison to first-time filings may also indicate the effectiveness of Chapter 12 in helping farmers attain long-term financial well-being. The node of repeat filing is further extended in the figure to investigate the time to refile

by a repeat case filer, especially into three categories: less than a year, 1-3 years, and more than 3 years, where we see a similar distribution among the time to refile categories.

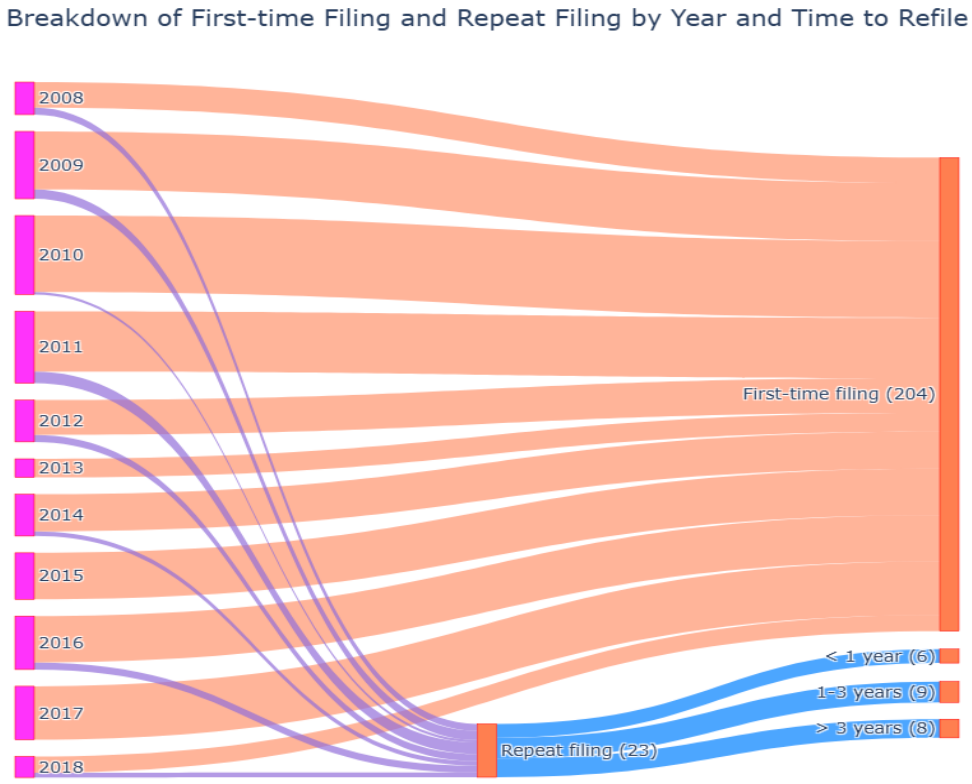

Figure 1: Breakdown of first-time and repeat filings by year and time to refile

Figure 2 illustrates the time to refile based on the year the first case was filed. The figure depicts the time elapsed between the year a debtor filed their first case and the year they filed another case. This underscores how the economic climate at the initial filing year influences the likelihood of refiling and the time it takes to refile. For reference, if the debtor's initial filing happened in a stressful economic environment (e.g., higher interest rates, lower commodity prices, inadequate government support), the debtor might

not be able to fully discharge the debt or complete the bankruptcy process, attaining only short-lived relief.

The economic condition at the initial filing at least partially dictates the farm's financial trajectory of the farm leading to repeat filing or not. If the economic conditions remain challenging, it increases the likelihood of quicker refiling. The quicker refiling of the debtors who filed in 2009, 2011, and 2012, compared to later years, could be attributed to several factors, such as the aftermath of the financial crisis of 2008, prolonged financial instability, and lower net farm income. Furthermore, the drought of 2012 had a significant impact on the crop yields in Georgia, affecting cotton, peanuts, and livestock feed production (Brady, 2012; Lacy, 2012). The worsened business situation after the disposition of the debtor's prior case might have led them to re-file, seeking bankruptcy protection.

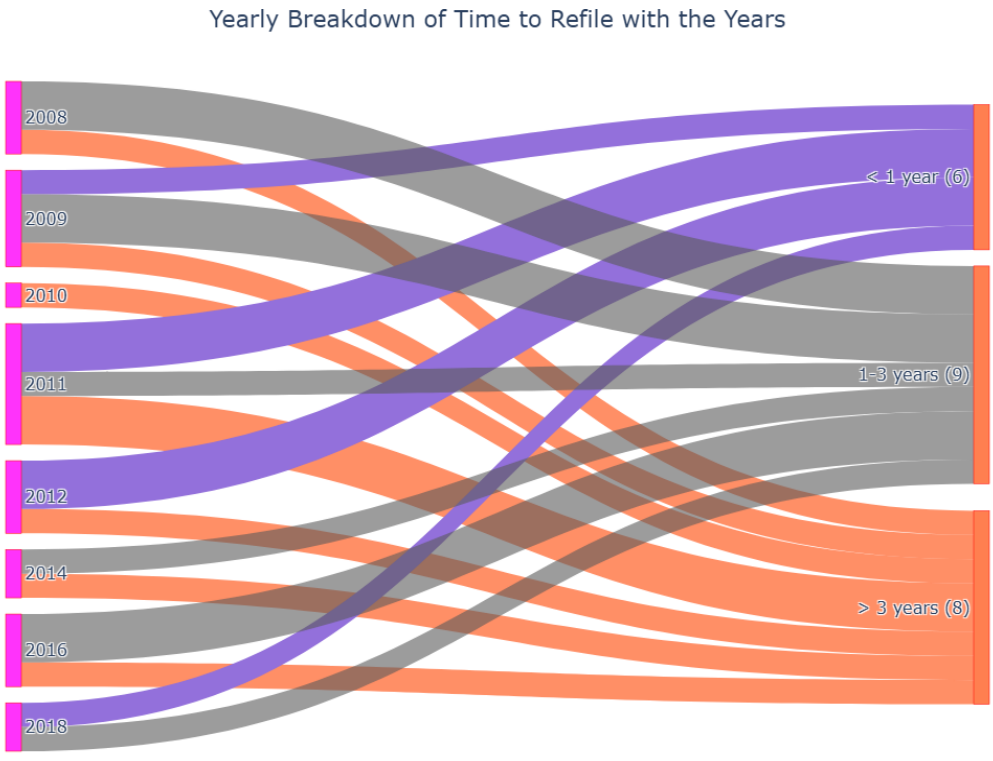

Figure 2: Yearly breakdown of time to refile by the years

Independent variable:

This study aims to understand the characteristics that differentiate a repeat filer from a non-repeat filer. As such, the independent variables were classified in three broad categories: Filer's characteristics, Filing circumstances, and Economic climate variables. Table 3 outlines the variables used under each category with their units, variations, and the sources and geography level.

Variables	Units	Variation	Source
Filers' characteristics			
Total liabilities	Scaled by $100,000, 2023 USD	Filing specific	FJC's IDB
Total assets	Scaled by $100,000, 2023 USD	Filing specific	FJC's IDB
Average monthly income	Scaled by $100,000, 2023 USD	Filing specific	FJC's IDB
Real property share	Percentage of Total Assets, 0 to 100	Filing specific	FJC's IDB
Secured liabilities share	Percentage of Total Liabilities, 0 to 100	Filing specific	FJC's IDB
Debtor type	Categorical variable	Filing specific	FJC's IDB
Filer's filing circumstances			
Joint filing	Dummy variable	Filing specific	FJC's IDB
Disposition status	Categorical variable	Filing specific	FJC's IDB
Economic controls			
Court District	Categorical variable	Filing specific	FJC's IDB
Pastureland share	Percentage of total county land area 0 to 100	County-level by year	USDA - NASS
Government payments	Scaled by $10,000, 2023 USD	County-level by year	USDA - NASS
% Δ Total employment	Year-over-year % change in total employment -1 to 1	County-level by year	Bureau Of Economic Analysis
% Δ Real GDP	Year-over-year % change in real GDP -1 to 1	County-level by year	Bureau Of Economic Analysis
Real property value	Scaled to $1,000, 2023 USD	State-level by year	USDA-NASS
Farm earnings	Scaled to $100,000, 2023 USD	County-level by year	Bureau Of Economic Analysis
Prime rate lagged	Prime rate year prior to filing 0 to 100	National level by year	St. Louis Federal Reserve - FRED

Table 3: Independent variable data description with geographic level, frequency, and source

The bankruptcy process is very complex; hence, the inclusion of a wide range of variables representing different elements of the bankruptcy filing and the farmer's conditions provides a more holistic outlook on the repeat filing scenario. Total assets, total liabilities, scaled for $100,000 in 2023 USD, provide information about what a farm owns and what it owes, highlighting the farm's financial health and leverage. These are also of particular interest as they are used to formulate the real property share and secured liabilities share variables, indicating farm asset and debt composition. Furthermore, the type of debtor variable characterizes the firm's bankruptcy proceeding and liability structure. Circumstances under which a debtor files the case, and the procedural features of a bankruptcy process, are also of significant value to consider in the model. Bankruptcy proceedings are legal matters; therefore, excluding the legal variable might hamper the model's predictive capability. Therefore, Joint filing and prior case disposition status are included in the model to understand the role of legal factors in influencing repeat filing.

It might not always be the case that the farmer's financial management is the culprit for their bankruptcy filing or re-filing. Even when doing everything right from the farm management standpoint, a worsening economic climate or the shrinking markets due to an unprecedented change in the overall economy can impact the repeat filing. To account for those unwarranted changes in the agricultural and market stratosphere, the inclusion of variables such as pastureland share is made, representing the agricultural outlook of the county the farm operates. Furthermore, as in times of farm liquidity crisis, the debtor and their family might opt to work off-farm to stay afloat. Hence, it is important to include some variables that would represent the economic climate of the county, state, or even

the nation. For this purpose, variables such as percentage change in employment rate, government payments, one-year lagged prime rate, and percentage change in GDP are considered in the model. Additionally, the inclusion of the court district in the model allows for testing variation across regional courts and provides insights regarding the local court practices and serves as geographical control that accounts for location-based differences.

Restrictions:

Some restrictions have been imposed in the model mainly to reduce the risk of outliers compromising the model's prediction and effectiveness. The model utilizes cases from 2008 to 2018. To avoid the inclusion of outliers in the dataset, a certain debt-to-asset ratio is used as a restriction. An extremely high debt-to-asset ratio indicates that these cases might not be suitable to proceed under Chapter 12 bankruptcy, and it would be better to file under other chapters, which can be treated as an outlier for a farm. For similar reasons, the dataset is also restricted to only including cases when the final disposition chapter is Chapter 12. Cases filed as Chapter 12 may not necessarily end as Chapter 12 and may instead be switched to other suitable chapters during the process. Hence, filtering the data based on Chapter 12 as the final disposition code helps somewhat segregate true Chapter 12 filings. Furthermore, a restriction on the total liabilities is used, as the US court has an eligibility debt limit for Chapter 12 bankruptcy. Due to the incorporation of the disposition status of the prior case into the model, the open cases are excluded.

Figure 3 illustrates the distribution of the total liabilities and total assets in its unrestricted form, with a dotted line representing the slope of 10, which is the debt-to-asset ratio. This specific restriction limit is used to avoid the impact of outliers in our

model. The exact value, i.e., 10, originates from the statistical summary of the debt-to-asset ratio for the whole unrestricted sample, which is 10 at the 98th percentile. The debt-to-asset ratio over 0.60 is already considered alarming, which signifies that the farm has lower solvency, which will hamper the capability to meet long-term obligations (UMN – Extension, 2018). This indicates that the majority of the case filers in the study are experiencing extreme debt situations, for which we only used the 98th percentile value in our model instead of a more restrictive 0.6. This makes sense as a farm filing for Chapter 12 bankruptcy is already a severely financially troubled entity seeking relief. Thus, using a much higher debt-to-asset limit, i.e., 10 to remove outliers instead of the general industry-standard 0.60, is logical when investigating farm bankruptcy cases.

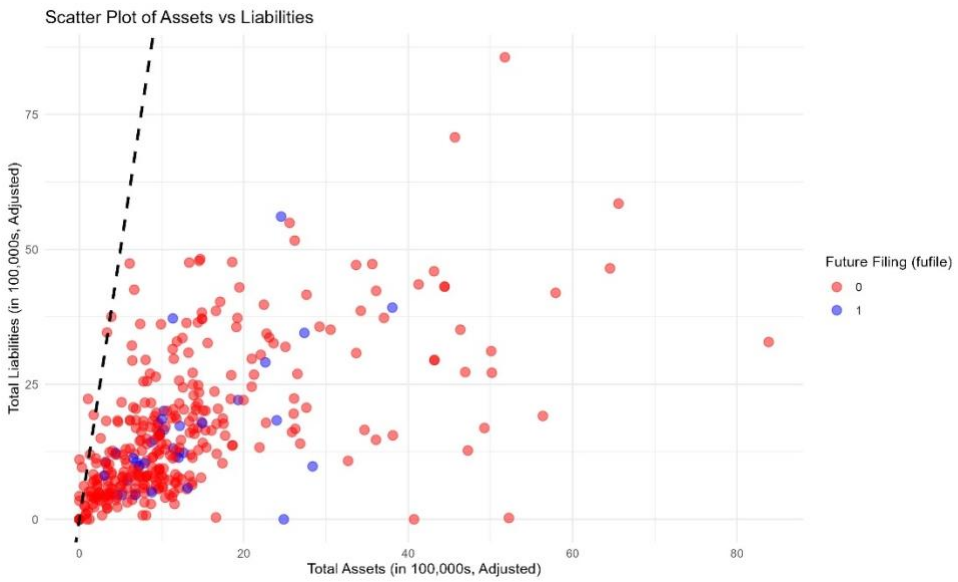

Figure 3: Debt-to-asset distribution

Table 4 presents the data filtering process used for the formulation of the dataset on which the regression is run. The initial dataset comprises 437 observations, and the final number of observations used in the model is 227. The dropped observation number

provided in the table is not on a cumulative basis, as there is an overlap between the variables. The final number is obtained using restrictions simultaneously. As such, the order in which the exclusions are presented should be interpreted independently and not sequentially. The FJC's IDB does not contain complete information we require for some of the variables. This is reflected by the 149 observations in the datasets. During the formulation of the repeat filing dependent, only the subsequent repeat case by the filer is considered. However, some debtors have more than one repeat filing during the span of the research period. Hence, it is a must that these cases be dropped from the model as they pose the threat of endogeneity. As stated earlier, cases with a debt-to-asset ratio strictly more than 10, open cases, and cases with a disposition chapter other than Chapter 12 are excluded from the model. The other form of disposition category, which is one of the disposition statuses we formulate, is removed from the model due to a lack of variability within the dependent variable. As we are investigating bankruptcy cases, the total liabilities value being zero does not make sense, as the debtor are filing to settle their debt with assistance from the court. As such, cases with total liabilities variable equal to zero are also removed from the model.

Total initial data	437
Missing observation in any explanatory variable	149
Removing connected cases	65
Final chapter not chapter 12	2
Debt-to-asset ratio > 10	96
Other forms of disposition	20
Open cases	21
Total Liabilities = 0	28
Final observations used	227

Table 4: Data filtering process

Summary Statistics:

Table 5 presents the overall descriptive statistics of the data points in the model, each providing information regarding the various characteristics of explanatory variables. The final number of observations utilized is 227, of which 23 are repeat cases and 204 are first-time filings. The total assets, liabilities, government payments, and Farm earnings are scaled to $100,000 2023 USD, while real property value is scaled to $1,000 2023 USD. The secured shares, real property share, and pastureland are expressed as proportion values ranging from 0 to 100%.

Observing tables 6 & 7, it is clear that joint filing is much more prevalent in non-repeat filers. While observing the disposition status, it is seen that the discharge is more prominent in first-time filings, while dismissal in repeat filings. Most of the debtors in the total sample are individual filers, followed by corporations, which are similar for repeat and non-repeat filing as well. Exploring the distribution of the cases filed based on the district court, it is observed that most of the cases are filed in the Middle District, while the

Northern District has the fewest. Similarly, in terms of the number of repeat cases, the Middle district has the highest number of cases of refiling, followed by the Northern and Southern districts. However, if the proportion of repeat filers to total is taken into consideration, the Northern district far surpasses the other two districts, with about 19% being repeat filers.

The total asset is slightly lower than the total liabilities for the overall data, with the gap widening for repeat filers. Repeat filers also showcase higher asset and debt composition in comparison to the non-repeat filers and overall filers. A similar result is observed for the land share indicated by the higher pastureland share for the repeat filer. This provides an interesting insight that the repeat filers are mostly operating in the county with a higher pastureland share.

The real property value for the state of Georgia, scaled by $1000 2023 USD, varies by year in the table. The real property value is higher for the repeat filer than for non-repeat filers, with a higher standard deviation. The government payments and farm earnings, scaled to $100,000 2023 USD, fluctuate across counties and years. Similarly, the percentage change in real GDP and the percentage change in total employment also vary by counties and years, reflecting the general economic well-being and labor conditions. Government payments and farm earnings are observed to be lower for repeat filers than for first-time filers. The percentage change in total employment shows worse labor conditions for the county repeat filers operate, while the percentage change in GDP is similar between the categories. The one-year lagged prime rate is a temporally varying national indicator and is found to have a higher mean for the repeat filers.

Although the total assets and total liabilities are provided at levels, it is also interesting to look at the debt-to-asset ratio, which provides a more dynamic relationship of debt and assets for different categories. Interestingly, the average debt-to-asset ratio for repeat case filers is lower compared to first-time filers, with higher variation for first-time filers, as indicated by the higher standard deviation of first-time filers. Due to the practicality of using total assets and total liabilities at the level terms, the debt-to-asset ratio is excluded in the model.

Variables	Total
Number of observations	227
Repeat filing	23
Non-repeat filing	204
Court District	
Middle	141
Northern	39
Southern	47
Joint filing	
Yes	51
No	176
Disposition	
Discharge	112
Dismissal	115
Debtor Type	
Individual	196
Partnership	5
Corporation	26

	Mean	Median	SD	Min	Max
Total assets	13.468	9.674	12.830	0.670	83.844
Total liabilities	16.438	12.808	12.193	0.247	58.497
Secured Share	79.134	86.009	20.633	1.153	100
Real property share	63.801	73.109	30.532	0.000	100
Pastureland share	18.877	11.830	14.379	3.814	53.337
Real property value	4299.744	4242.935	360.991	3885.384	5124.893
Government Payments	54.747	39.795	55.871	0.191	313.596
Farm earnings	255.770	187.726	273.981	-132.079	1270.127
% Δ Total Employment	0.002	0.000	0.037	-0.093	0.130
% Δ Real GDP	0.005	0.009	0.051	-0.156	0.147
Prime rate lagged	3.840	3.250	1.241	3.250	8.054
Debt-to-asset ratio	1.653	1.368	1.182	0.005	9.270

Table 5: Summary statistics of independent variables. Total assets, total liabilities, government payments, and farm earnings are scaled to $100,000 2023 USD, and real property value is scaled to $1,000 2023 USD. Secured share, pastureland share, and real property share are in the continuous range of 0 to 100%. Percentage employment change, prime rate lagged, and percentage GDP change are in percentage points

Variables	Repeat filing
Number of observations	23
Court District	
Middle	14
Northern	8
Southern	1
Joint filing	
Yes	5
No	18
Disposition	
Discharge	2
Dismissal	21
Debtor Type	
Individual	20
Partnership	1
Corporation	2

	Mean	Median	SD	Min	Max
Total assets	13.308	10.262	9.178	3.083	38.071
Total liabilities	17.164	12.322	13.093	4.503	56.089
Secured Share	85.377	93.692	15.706	42.288	99.803
Real property share	75.780	83.410	27.272	0.000	97.9845
Pastureland share	26.832	33.386	16.551	7.124	47.192
Real property value	4377.146	4302.527	422.834	3885.384	5124.893
Government Payments	41.075	20.809	54.064	1.096	188.858
Farm earnings	243.830	178.918	254.334	-85.526	871.077
% Δ Total Employment	-0.007	-0.010	0.027	-0.060	0.038
% Δ Real GDP	0.005	0.006	0.036	-0.066	0.078
Prime rate lagged	4.268	3.260	1.653	3.250	8.054
Debt-to-asset ratio	1.437	1.310	0.758	0.346	3.274

Table 6: Summary statistics of repeat filers

Variable	Non-repeat filing
Number of observations	204
Court District	
Middle	127
Northern	31
Southern	46
Joint filing	
Yes	46
No	158
Disposition	
Discharge	110
Dismissal	94
Debtor Type	
Individual	176
Partnership	4
Corporation	24

	Mean	Median	SD	Min	Max
Total assets	13.486	9.618	13.196	0.670	83.844
Total liabilities	16.356	12.889	12.119	0.247	58.497
Secured Share	78.430	84.656	21.031	1.153	100
Real property share	62.450	70.988	30.645	0.000	100
Pastureland share	17.980	11.767	13.875	3.814	53.337
Real property value	4291.017	4242.935	353.479	3885.384	5124.893
Government Payments	56.288	43.097	55.990	0.191	313.596
Farm earnings	257.117	190.128	276.663	-132.079	1270.127
% Δ Total Employment	0.003	0.001	0.037	-0.093	0.130
% Δ Real GDP	0.005	0.009	0.052	-0.156	0.147
Prime rate lagged	3.792	3.250	1.182	3.250	8.054
Debt-to-asset ratio	1.677	1.382	1.220	0.005	9.270

Table 7: Summary statistics of non-repeat filers

Chapter 4

METHODS

We estimate the probability of future filing, the limited dependent variable in our model, with binary logistic regression techniques. Logistic model provides us with the likelihood of the event occurring, in our model, whether a firm refiles or not. The nature of the logit model predicts whether an observation falls in one of the two categories, compared to the linear regression model, which assumes a continuous variable, making it much more suitable for our analysis of repeat filing. The scarcity of economic analysis relating to farm bankruptcy repeat filing provides us with an opportunity to pioneer the choice of model. While the study by Robinson et al., (2024) on repeat consumer bankruptcy employs survival analysis to predict the probability of repeat filing, we use a logit model as we are much more interested in what factors influence a farm to refile rather than the timing of the refiling.

$$Y_{it} = \beta X_{it} + \theta L_{it} + \gamma A_{it} + \epsilon_{it}$$

Here the Y_{it} represents the limited binary dependent variable categorized as repeat and non-repeat filing for a case filing i at time t. L_{it} indicates the filing circumstances or procedural variable relating to the case at the time of filing. The filer's financial characteristics at the filing analyzed in the regression are illustrated by X_{it}. A_{it} represents the macroeconomic and agricultural conditions at the time of the filing. ϵ_{it} is the logistic error term, assumed to exhibit a standard logistic distribution.

The choice of binary logistic regression, using the MLE estimation technique rather than Ordinary Least Squares(OLS) is inherently due to the nature of our dependent variable. The dependent variable is coded "1" for the repeat filing occurrence and "0" for

the non-repeat filer, indicating that there can only be a possibility of one event happening or the other. The OLS in this case will not be suitable as it assumes a dependent variable to be unbounded and continuous; however, our dependent variable can only be between 1 and 0 and non-linear. This raises serious issues, to the point that the predicted probabilities from OLS are not within the 0 and 1 range, highlighting the restrictions on interpretability and the unreliability of the predictions. MLE, on the other hand, estimates within the logical bounds. MLE estimates the parameter in the statistical model by using the values that maximize the likelihood function. To summarize, we model the probabilities of the event occurrence with the logistic function, and the parameters β are estimated using MLE to maximize the probability of observing a given outcome (Wooldridge, 2012).

The logistic function is presented below:

$$P(Y_{it} = 1|X_{it}, L_{it}, A_{it}) = \frac{e^{\beta X_{it} + \theta L_{it} + \gamma A_{it}}}{1 + e^{\beta X_{it} + \theta L_{it} + \gamma A_{it}}}$$

Here, $P(Y_{it} = 1|X_{it}, L_{it}, A_{it})$ indicates that the probability of Y_{it} takes the value 1 given the explanatory variables X_{it}, L_{it}, A_{it} that represents the filer's financial characteristics, filing circumstances, and general macro-economic climate at the time of filing. The exponential sign represents the logit transformation that ensures the predicted probability stays within the (0,1) bound.

The coefficient estimates from the logistic regression possesses limited interpretive value, except indicating the direction of the variable. In a Linear Probability Model (LPM), we can interpret the estimate as the marginal effect on the dependent variable with a change in the specified independent variable, holding all other variables constant. It is not as straightforward in the logit model; hence, we make an additional

estimation of the marginal effects to derive inferences on the impact of an independent variable. Specifically, we are estimating the Average Marginal Effects (AMEs) to see the marginal effects of additional change in one independent variable on our dependent variable, i.e., repeat filing, holding all other factors constant. The average marginal effect is estimated by taking the average of the calculated marginal effects for each observation (Perraillon & Hedeker, 2024). We use the average marginal effects in comparison to marginal effects at the mean, as AMEs are easier to interpret, robust to skewed data, and better representative of the population (Bartus, 2005).

The standard errors presented in this study are conventional standard errors. The standard errors in a logit model rely on the MLE, which leads the standard errors to be asymptotically normal compared to the OLS, where the standard errors are derived assuming a normal distribution of the error term. The regular standard errors in a logit model estimation are consistent and assume homoskedasticity. However, the assumption of homoskedasticity does not generally hold in the real world. For this reason, we also estimate the robust standard errors, which account for heteroskedasticity, to compare with the conventional standard errors.

Data filtering and the restriction of related cases contribute to a model specification that mitigates multicollinearity concerns. The exclusion of the related cases and pending cases in the effort to create comparable categories of the dependent variable ensures that the model is reliable and consistent. To ensure that the variance of the regression coefficients is not inflated by multicollinearity, a Variance Inflation Factor (VIF) test was performed to ensure correct model specification.

CHAPTER 5

RESULTS

The results from the logistic regression are presented in table 8, reporting the coefficient estimates and average marginal effects. Along with the coefficient estimates and average marginal effects, the standard error is also examined to test the statistical significance of the explanatory variables. The following denotation for the significance is used: * represents the significance at a 10% level of significance, ** represents the significance at a 5% level of significance, and *** represents the significance at a 1% level of significance. The level of significance represents the probability of committing a Type 1 error (rejecting the true null hypothesis). In other words, it is the probability of incorrectly predicting that an explanatory variable has a significant relationship with the dependent variable when it does not have such a relationship. The model utilizes 227 observations to regress the dependent variable on the explanatory variable due to the presence of missing values for some of the independent variables.

The coefficient estimates signify the general direction of the factor variables and do not have a meaningful interpretation of the magnitude. We observe Table 8 to understand the average marginal effects of the explanatory variables, which signifies the magnitude of the variables on the predicted variable. The average marginal effects represent the average change in the predicted probability of the dependent variable with a unit change in the explanatory variable, holding all other variables constant. The part henceforth discusses the results and their interpretation, establishing the real-world parallels.

Examining the average marginal effects from Table 8 shows that prime rate lagged, total liabilities, and dismissal have positive relationships to future filing, while total assets, total employment change, and farm earnings are negatively associated with future filing. Among the legal or procedural factors included in the model, dismissal in the prior case is found to have a statistically significant relationship with repeat filing. Dismissal in the prior is shown to have almost an 18% increase in the likelihood of future filing at a 1% level of significance. The percentage change in total employment, and one-year lagged prime rate representing the agricultural and macro-economic conditions, have a statistically significant relationship with future filing at the 5%, 5%, and 10% levels of significance, respectively. Among the filer's financial characteristics, the total liabilities and total assets variables are found to be statistically significant at a 5% and 10% level of significance. This provides empirical evidence that the repeat filing is influenced by a combination of factors such as the filer's financial profile, filing circumstances, and the broader economic environment. It can thus be inferred that sustainable long-term financial resilience hinges on multiple factors, not solely on the farming operation and the farm's specific characteristics.

Table 9 compares the normal standard error to the robust standard for the model. We find that the standard error for total assets gets lower when robust standard error is applied, causing the insignificant total assets to become significant. Although in the field of econometrics, we don't really know whether the robust standard error will be smaller or larger until estimation, we are sure that the robust standard error corrects for the heteroskedasticity in the error term and makes the inference more reliable. Pischke (2007) states that if the observations are independent of each other, a 25% change from

the normal standard is acceptable in the field of applied economics. The correlation between the variables was also tested and found to be well within the range that supports the reliability of the statistical information provided by the model.

Variables	Coefficient	AME
Total assets	-0.0509	**-0.00349***
	(0.0314)	**(0.00211)**
Total liabilities	**0.0590****	**0.00405****
	(0.0289)	**(0.00193)**
Secured liabilities share	0.0220	0.00151
	(0.0175)	(0.00118)
Real property share	0.0119	0.000818
	(0.0116)	(0.000785)
Pastureland share	0.0371	0.00255
	(0.0359)	(0.00244)
Property value	-0.00211	-0.000145
	(0.00144)	(9.76e-05)
Government payments	0.00256	0.000176
	(0.00670)	(0.000459)
Farm earnings	**-0.00235***	**-0.000161***
	(0.00136)	**(0.000095)**
% Δ Total Employment	**-21.47****	**-1.472****
	(10.89)	**(0.731)**
% Δ Real GDP	5.585	0.383
	(6.316)	(0.431)
Prime rate lagged	**0.788****	**0.0540****
	(0.368)	**(0.0245)**
Court District		
Northern district	-0.399	-0.0294
	(1.003)	(0.0688)
Southern district	-1.865	**-0.0952****
	(1.226)	**(0.0417)**
Joint filing	-0.804	-0.0492
	(0.710)	(0.0383)
Debtor type		
Partnership	0.797	0.0685
	(1.412)	(0.136)
Corporation	-1.031	-0.0584
	(0.961)	(0.0442)
Disposition	**3.063*****	**0.175*****
	(0.877)	**(0.0384)**
Constant	-1.275	

	(5.292)	
Observations	227	227
R-squared	0.3077	

Table 8: Coefficient estimates and average marginal effects, Logistic regression. The Middle District is used as the reference category for court district; non-joint filing serves as the base group for the joint filing variable; individual debtors are the reference group for debtor type; and discharge is the reference category for case disposition. Normal standard errors shown in parentheses*** p<0.01, ** p<0.05, * p<0.1

Variables	AME	Normal SE	Robust SE
Total assets	**-0.00349**	**(0.00211) ***	**(0.00152) ****
Total liabilities	**0.00405**	**(0.00193) ****	**(0.00183) ****
Secured liabilities share	0.00151	(0.00118)	(0.00117)
Real property share	0.000818	(0.000785)	(0.000587)
Pastureland share	0.00255	(0.00244)	(0.00244)
Property value	-0.000145	(0.000098)	(0.000099)
Government payments	0.000176	(0.000459)	(0.000467)
Farm earnings	**-0.000161**	**(0.000091) ***	**(0.000095) ***
% Δ Total Employment	**-1.472**	**(0.731) ****	**(0.564) *****
% Δ Real GDP	0.383	(0.431)	(0.315)
Prime rate lagged	**0.0540**	**(0.0245) ****	**(0.0242) ****
Joint filing	-0.0492	(0.0383)	(0.0350)
Court District			
Northern	-0.0294	(0.0688)	(0.0667)
Southern	**-0.0952**	**(0.0417) ****	**(0.0314) *****
Debtor Type			
Partnership	0.0685	(0.136)	(0.159)
Corporation	-0.0584	(0.0442)	(0.0389)
Disposition	**0.175**	**(0.0384) *****	**(0.0361) *****
Observations	227		
R-squared	0.3077		

Table 9: Comparison of normal and robust standard errors. *** p<0.01, ** p<0.05, * p<0.1

CHAPTER 6

CONCLUSION

Utilizing the legal variables along with the filer's financial characteristics and economic controls, this study provides compelling evidence that repeat bankruptcy filing is the outcome of not only deteriorating economic conditions and the filer's financial standing but also the legalities associated with bankruptcy proceedings. From the findings, it is observed that repeat filing is sensitive to the overall debt burden of the farm, while broader financial characteristics, such as assets or debt composition, have limited predictive influence for repeat filing. The significance of the filer's higher debt in our model raises concerns that Chapter 12 might not effectively address the underlying financial difficulties of the large debt farms, potentially leading to only temporary respite rather than long-term stability. Future research could look more into this by incorporating more nuanced farm-specific variables such as operating expenses and income, cash flow variables, etc., which would be better representative of the farm's stability and financial health.

These findings enrich our understanding of Chapter 12 bankruptcy regarding its usefulness and recurrence, contributing to the sparse farm bankruptcy research repository. With the methods employed in data creation, such as restricting the data to represent unique cases and incorporating a wide range of factors, we reliably predict the future filing with binary logistic regression. Leveraging FJC's IDB and PACER search to compose a dataset, contributed to the disentanglement of the connected cases that are filed by the same entity, providing a better representation of the repeat filing and a robust dataset to employ the model. The presence of the connected cases is a limitation of the

IDB dataset. Using this method, those limitations are addressed, and a comprehensive, reliable dataset is constructed for this study and future work.

This study is limited to the state of Georgia; thus, the generalizing capability of the model might be limited as different geographic locations might harbor varied characteristics of farms, filing rates, economic environment, etc. Despite this limitation, this study serves as a valuable first step, providing a foundation for future studies. Future research can leverage the methodology employed in this study to understand the effectiveness of Chapter 12 filing across different states or even at the national level. The incorporation of key elements such as the case distinction, comparison of the repeat and non-repeat filers based on their initial filings, and inclusion of the legal factors allows for better comparison and influences the reliability of the econometric methods. By focusing on these aspects, this study provides a more nuanced approach to understanding Chapter 12 bankruptcies, contributing greatly to future research.

In the model, we find that a bankruptcy process's effectiveness hinges on a plethora of factors, broadly labeled as financial characteristics, legal factors, and macroeconomic factors. Among the financial characteristics, the total liabilities and total assets variable at the time of filing show a significant predictive power for repeat filing, suggesting that other factors such as real property share and secured liabilities share do not statistically influence the probability of repeat filing. Dismissal in the prior cases compared to discharge shows a positive association with the repeat filing in this study. Dismissal in the prior case might suggest that the debtors were not able to completely discharge their debt, leaving their financial problems unresolved, and increasing their chances of refiling. This could occur due to several reasons, such as failure to meet the

repayment requirements, procedural challenges, personal emergency, health issues, or exploitation of bankruptcy benefits to stall the creditors.

Macroeconomic variables at the time of the filings are found to be statistically significant for repeat filing, highlighting the importance of the external forces dictating the farm's stability. The court district variable is included in our model to control for the geographical variation and some of the court-related attributes. We observe that the Chapter 12 bankruptcy cases filed in the Southern District are about 9.5% less likely to have a repeat filing compared to the Middle District. The southern court region, which mostly encompasses the southeast region of the state, houses large commercial farms that might be more resilient to the financial shocks. Furthermore, these sorts of farms might pursue bankruptcy under other business-related chapters that limit our observation of the repeat filing or filing altogether under Chapter 12. Robust standard error is also calculated to account for the heteroskedasticity, where we observe mixed direction. Using robust standard errors, the standard errors for some variables increase, suggesting that the normal model might be underestimating. Conversely, the robust standard errors for some variables are decreasing, indicating that the regular model might be overestimating.

A higher percentage point of employment change year-over-year is negatively associated with the repeat filing, and an increase in the one-year lagged prime rate is positively associated with the repeat filing. Furthermore, higher farm earnings at the county level are found to be negatively related to repeat filing. These three variables provided insights regarding the general economy at the time of filing, providing us with information about the on-farm standing and off-farm opportunities. Increasing percentage changes in employment suggest improving labor market conditions. In such a situation,

farmers might benefit from the additional off-farm income, which reduces the financial strain and helps meet the debt obligations, decreasing the risk of repeat filing. Similarly, improving job market conditions might be indicative of broader economic growth, allowing the strained farmers to better production, access credit, and supply opportunities. One-year prime rate increase tells a story that the rising borrowing cost put a strain on the farmers who operate on capital-intensive ventures, where the funds are usually sourced externally. Rising interest rates might constrict the already thin profit margins, potentially leading to cash difficulties for the financially distressed farms. This situation might contribute to the accumulation of debt over time, ultimately leading the farms to file for bankruptcy again.

Among the financial characteristics included in the model, total assets and total liabilities showcase a significant relationship with the probability of repeat filing. Higher total asset is found to decrease the likelihood of refiling, whereas higher liability is statistically found to increase the likelihood of repeat filing. Higher asset debtors are in a better position to negotiate new terms with creditors, find a new line of credit, or refinance. Furthermore, they are better equipped to withstand financial shocks and can also liquidate their holding to avoid filing. In contrast, higher debt holders do not enjoy such advantages as the debtors with higher assets. Interestingly, the secured liabilities share is found to be insignificant in predicting the likelihood of refiling. This suggests that the overall value of the total liabilities is much more important than how it is structured, i.e., secured or unsecured. A similar result is showcased by real property share signaling that the overall scale of the farm is more critical than the composition in predicting refiling behavior.

Chapter 12 is a legal procedure designed for financial relief and restructuring of debt, comprising legal mechanisms such as prior disposition, that might strongly influence whether a farm refiles or not. Additionally, economic factors such as prior year prime rates, farm earnings, and employment changes might have a quicker impact on financial viability, which may not be reflected by the static balance sheet variables such as total assets or debt composition at the time of filing.

One of the key limitations of our study is that we only observe the financial standing of the farm at the time of filing. A typical bankruptcy case runs for 4-6 years, providing different opportunities for significant changes to their financial standing and decision-making, which might be influential to repeat filing probability but not captured by our data. Our data relies on the truthfulness of the debtor filing the voluntary bankruptcy petition. As such, we cannot rule out the possibility of missing data and a misrepresentation of the data by the filers, whether done intentionally or not. Also, we are unable to discern if a bankruptcy filing is filed to abuse benefits such as the automatic stay entailed during the process. In this situation, the filers might be necessarily looking for temporary relief rather than sustainable financial relief that the bankruptcy process hopes to achieve. While these sorts of situations can be distinguished by using prior case dismissal reasoning, such as dismissal due to bad faith or creditors' objection to some extent, the reliability of such a method is questionable. This provides opportunities for future research to explore further with the inclusion of other legal variables as well, such as Chapter 12 plan, pro se filing, or any other variable that would highlight the relationship between the debtor, creditors, and trustee.

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