

1997 BANKRUPTCY PETITION STUDY – EXPERIENCE APPLYING A TOTAL QUALITY DESIGN PARADIGM

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KEY WORDS: Total Quality Design

Abstract

A stratified national sample of 2,000 petitions was chosen for 1997 from the over 1.3 million Chapter 7 bankruptcy petition filings. A companion sample of about 1,000 Chapter 13 filings was also taken. These are first of a kind national samples of bankruptcy petitions. For the 1997 study a major effort was made to build in modern quality systems as part of implementing a total survey design concept. The challenges faced in our efforts will be the main focus of this paper – especially how we addressed and overcame them. Among the themes to be covered are the application of rapid prototyping, “just-in-time” systems, interpenetrating sampling to control and measure nonsampling error, and continuous analysis so final stakeholders are part of the system from beginning through each step and not just at the ends.

I. Introduction

During the past few years, bankruptcies have grown rapidly. In 1995, the Bankruptcy Notification Service processed a total of 882,781 bankruptcies. By 1997, that number had jumped to almost 1.4 million. This represents an increase of over 50 percent from 1995 to 1997 and about 20 percent from 1996 alone. Since then the growth rate has increased, although at a slower pace, and continues to be high.

In other words, despite the strong overall economy which has experienced steady growth, low levels of unemployment and high consumer confidence, bankruptcy filings are at record levels in recent years. This contrast between the healthy economy and the high number of filings has turned attention towards the bankruptcy laws. The reform proposals now being considered by Congress attempt to deal with the number of bankruptcy filers and debt repayment in the bankruptcy system.

One such proposal is the “Bankruptcy Reform Act of 1998” H.R. 3150. If certain conditions are met, the needs-based provision of H.R. 3150 requires petitioners with monthly incomes of at least 75 percent of the national median for families of comparable size to file under Chapter 13 which entails a repayment plan for the incurred debt, rather than the Chapter 7 option,

where debts are cleared away. Once living expenses and secured and priority debt payments are made, the petitioner must file under Chapter 13 if he/she has a monthly net income of at least \$50 and the capacity to repay 20 percent or more of his/her unsecured non-priority debt within five years.

The economics consulting and quantitative analysis group of Ernst & Young LLP (E&Y) teamed up with Lundquist Consulting to analyze the effects of the needs-based bankruptcy provisions of the “Bankruptcy Reform Act of 1998” (H.R. 3150) on Chapter 7 filers [1]. This was the first study to evaluate repayment capacity on a national basis [2,3,4,5,6]. Simply put, if we were to get a clearer picture of who’s filing Chapter 7, why, and what kind of debt they have, this would allow us to estimate how many of these petitioners would be impacted by new legislation and required to file Chapter 13, notably H.R. 3150 which has been passed by the House of Representatives.

The paper is organized into four sections. Following this introduction (section I) there is a section on the basic study design and approach (section II). The remaining sections deal with how the processing of the data was organized (section III) and the post-processing details and the continuing next steps (section IV). In particular, the paper examines the specifics of the training and screening of the data entry staff, the specific data processing steps and the quality review verification procedures used.

II. Basic Study Design

The sample design for this study used a two phase sampling plan. The National Bankruptcy Notification Service (BNS), maintained by Visa and Mastercard since 1995, records nearly all non-business bankruptcy filings in the US. The sample was drawn from the 1997 BNS database which covered all 11 federal court circuits and 90 districts.

First-Stage. The first stage sample randomly drew Chapter 7 petitioners in each district to ensure that the monthly sample was proportionate to the actual monthly volume in the district. Approximately 500 Chapter 7 petitioners for each of the 90 districts in the US were chosen in this first stage.

Second Stage. For the second stage sample, the sample sizes for the districts were determined by allocating the total sample in proportion to each district's volume within each month of filing. Additional observations from the smallest districts supplemented the sample to obtain a minimum number of cases per district. The final sample was comprised of over 2,000 Chapter 7 bankruptcy petitions.

Once the sample was chosen, an outside vendor obtained the designated petitions from the applicable court. Following a tight time schedule was imperative. The petitions were copied and transmitted to Lundquist Consulting for data entry. This part of the study proved highly successful with the usable sample being about 97 percent of the size of the selected sample. All steps were independently monitored during the data gathering process. For example, a sub-sample of cases was selected for independent reprocessing.

A daily regime of checks and balances for the data processing of the petitions was important to the study design [7]. Control numbers, validity and inconsistency checks were some of the tools used to ensure the accuracy of the data entry.

Daily quality checks were done. This daily quality sample was designed to measure the quality achieved and provide insights to improve the ongoing data entry operation. Two kinds of review were carried out. One type of review entailed re-entering data for applicable fields and checking for and then correcting discovered discrepancies. A second broader review of other parts of the data entry process visually reviewed hard copies of the petition for selected keyed entries. For both types of quality review, all the detected data entry errors were corrected on the computer file used for the data analysis.

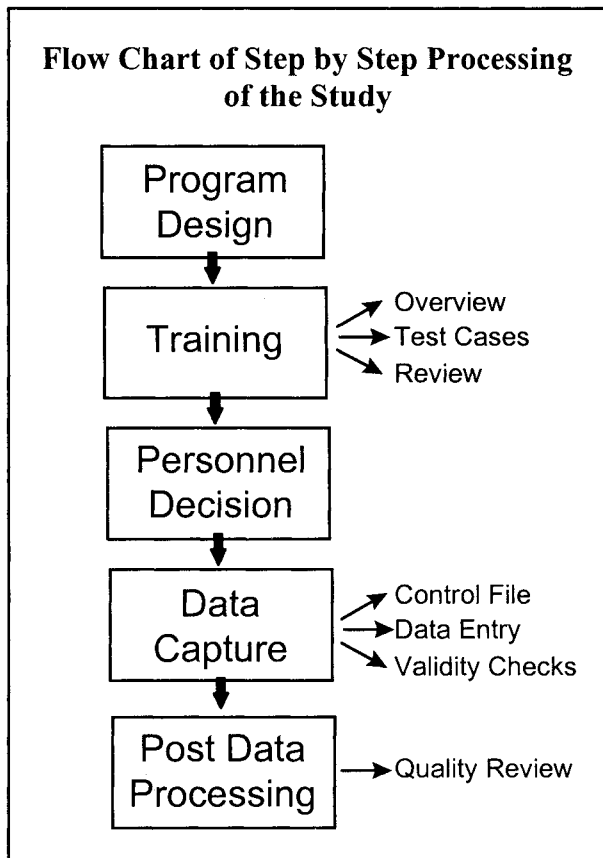
After all processing was concluded satisfactorily, an extensive analysis was conducted. The analysis was based on the final stratified random sample -- statistically valid on a national basis for the calendar year 1997. The analysis estimated the percentage of 1997 Chapter 7 filers that would have been impacted by the needs-based provision of H.R. 3150 and required to file Chapter 13 in lieu of Chapter 7. It also examined the total debt repayable by impacted Chapter 7 filers. The study findings were reported in testimony by E&Y for the House Bankruptcy Hearings in March 1998.

III. Step by Step Processing of the Study

Program Design and Burn-In Phase

Implementation of this project entailed many challenges along the way. The time schedule was

short. The Lundquist Consulting team had to put together a temporary staff to complete a task which they had never done before. A further challenge was the necessity of accurate data with a firm deadline in place to present to Congress concerning the impending legislation. In addition, methodological challenges in estimation arose, such as treatment of outliers [8]. And as with any project, there were a finite amount of resources available. Yet above all, the coordination between the Lundquist consulting team and the E&Y team as well as within each team was key.



The first challenge was to design a program that would address all possible iterations of the petitions found as well as be flexible enough to allow modification to the program should the need arise. A validity check process was designed and implemented, both self-controlled and management controlled. It was estimated that each data-entry person would be able to enter 20 petitions a day, and based on a timetable of 3 months, six workstations were set up for the project. During the first two weeks of the project, minor modifications were made as the need arose, such as additional validity checks, as well as reformatting of certain sections to ease the data capture process.

Training Process

Explain Project → Explain Program → Enter Test Cases → Review → Live Data Entry

The staff's training process began with a brief overview of the project. The trainer explained that they would be entering bankruptcy petitions and these petitions were public information and therefore were not confidential.

Printed instructions were handed out as well as category indices and calculators. After the brief oral explanation, each staff member was given a test case. Originally 10 test cases were chosen for the training process. Due to time constraints, it was decided that only five were to be used in order for the staff member to be able to begin entering live data by their third day. Each entry person had to complete all five test cases before proceeding to enter live petitions.

All five test case petitions chosen were handpicked to represent a wide variety of filings. After giving the entry trainees an opportunity to go over the petition, the trainer walked them through the entry process, page by page, and readily encouraged the trainees to ask questions if they were unsure or confused. Upon completion of the first petition, the staffer was given the next one and told to try it on their own. The trainer stood by and observed while answering any questions that arose. A few people finished in the first day, but most finished on their second.

After the five test cases were completed, the staff member began live data entry. During the entire training process, accuracy was emphasized, but speed was not.

Personnel Decision Process

It took a few weeks and about thirteen people before finding a team of nine which worked well together and had high productivity levels. The types of errors the data entry people made can be broken down into the two following categories:

Inconsistent - Errors made were random and did not form any kind of pattern. Usually these errors were corrected with further training or reminders.

Systematic - Errors made formed a pattern. The data entry person made the same type of errors consistently, even with further training.

The retention decision was based on:

- Improvement in productivity
- Understanding the Project - the staffer must show ability to understand the information and instructions – does the staffer ask the same questions multiple times – this can be an indicator of a misunderstanding of the process and an inability to make educated judgment calls
- Attendance
- No repetition of systematic errors
- Achievement of certain volume and quality standards - Volume entered after three days was greater than 15 with acceptable error rate

Nine out of the thirteen trained were kept. Some trainees took a little longer than others to learn the process. If they looked promising, the trainees were kept.

Data Capture

Control File → Data Entry → Workstation Validity Checks → Master Station Validity Checks

The Data Capture Process can be broken down into the following components: Control File to check in the petitions, Data entry by the staff, Workstation level validity checks, and finally, Master station validity checks.

Control File Process

Receive Petitions → Stamp Control File → Enter Petition Information on Control File → Sub-sample Stacks

In this project, in order to manage the receipt, completeness, and assignment of each petition, a tracking database was created, referred to as the sample control file. This control file was used as an index for the data capture process.

Each petition's record in the control file included basic petition information, such as case number, date filed, debtors' names, etc.; assignment and tracking fields were added in order to better manage the petitions. A unique control number was stamped on

each received petition for assignment and tracking purposes. This control number was then entered in the control file. In addition, a file containing the initials or "code" of the assigned data entry person was also entered onto this database.

The purpose of the Control file was to:

- Manage the petitions received from Bankruptcy Data Retrieval
- Track the assignment of the petitions for data entry
- Track the completeness of the petition
- Track the substitutes filed

After a petition was received and assigned a control number, the completeness of the petition was verified. Upon entry into the control file, each petition was placed sequentially into one of a certain number of sub-sample stacks. The number of sub-samples depended on the number of data entry personnel on staff, which varied during the project (i.e. six staff members = six sub-samples). Since the petitions were packed and organized by geographical area, the sub-samples were necessary to ensure that one person did not receive a localized set of petitions.

The challenge of the sub-sample process was to make sure that faster people had petitions to enter and no time was wasted. In order to compensate, occasionally a staff member had to take a few petitions from another stack until the control file person could provide the person with more petitions. Later, we decided to add an extra sub-sample stack, to accommodate the faster staff members. So now, 6 staff members = 7 sub-samples.

In the beginning, the volume of petitions received was so great that it took about 3-4 weeks to catch up the control file completely. At that point, it became a bit of a struggle to make sure that each entry person had enough to do and all time was utilized.

Workstation Data Entry and Validity Checks

**Pick Up from Sub-sample Stack → Data Entry
→ Self-controlled Validity Checks**

Each data entry person was assigned a number or initials during the training process, which were used to identify the actual entry person of the petition. Each temp would go to his/her sub-sample stack and pick up 5-10 petitions. At the point of entry, the data entry personnel had to enter their "code" before bringing up

the information. The use of this code helped identification and tracking during the verification process. At the end of the day, staff members were not allowed to leave work with a petition unfinished, so the data entry staffers were asked to plan accordingly.

As the data entry process proceeded, new types of claims, debts, etc., were encountered and had to be addressed by adding new category letters or numbers. Certain adjustments had to be made to the program as well because of irregular or "different" petitions that were discovered. During the entry process, if any problems or questions arose, a manager was available to assist at all times.

Overall, the data entry process was very interactive with questions occurring quite often. Often the questions brought up new ideas and helpful ways to improve the process or the program itself. As the project proceeded, the number of questions decreased.

A comprehensively trained staff working in an environment allowing the staff to succeed was in place. A data entry platform that would not get in the way of success was needed. A very easy to understand platform was built, with a very simple, straightforward, interface. This platform incorporated self-controlled validity checks to allow personnel to immediately see errors, thereby minimizing errors to begin with, as well as minimizing the need for QA/QC personnel to correct these errors. This system allowed personnel to catch their own errors, as well as errors from the petition itself.

Two types of workstation validity checks:

- Summary of schedules total must match schedule listed total
- Schedule line item total must matches schedule listed total

The entry person noted any problems that were found with the petition with a post-it note placed on the petition itself. These notes helped the person conducting the daily Master Station Verification process.

Master Station Validity Checks

**Compile Data → Workstation Validity Check
→ Master Station Validity Check → Weekly
Review → EY Sample**

The Master Station Verification Process began by verifying that the counts for records entered, for the

completed (paper) petitions and for the matched control records were identical. A random number list was used to select a petition to verify on each workstation. Since the staff averaged about 20 petitions each per day. This represented approximately five percent of all petitions entered on a given day.

Once the petition was in hand, it was checked in its entirety, page by page, against what the data entry person had entered. Any mistakes that were found were corrected and noted on a ledger. After completing the check, this record was flagged. The ledger was used the following morning to inform individually each data entry person of the mistake(s) he or she had made.

If any errors consistently appeared among the staff, these were addressed to the group. Once per week, a quality circle session was held to go over the common mistakes/errors that people were making and to answer questions anyone might have.

Common Types of Errors:

- Often the amounts for the items entered did not match the total in the summary of schedules.
- Categorization - the judgment calls concerning types of debts, etc. had to be consistent among the staff.
- Amended schedules gave the entry people problems. Most times, the summary of schedules did not reflect the new entries on amendments.

After the single petition check was conducted, the data had to be prepared for the full validity check process. Each workstation's data, as well as the control file, was backed up on a daily basis and then compiled. The compiled data was then run through another set of QC procedures and macros. The resulting errors were then printed and each error was checked.

Validity Checks included:

- Summary of schedules total must match schedule listed total
- schedule line item total must match schedule listed total
- Line item count must match line item entries
- Schedule line item total must match summary of schedule total

Errors usually consisted of miscounted items, numbers entered incorrectly in the tables, or the totals in the tables which did not match the total from the summary of schedules. Any mistakes by the staff

member were corrected and flagged as an error. Errors that were on the petition and not the fault of the entry person were not corrected and were flagged as verified.

As the project proceeded, we came to the realization that the petitioner or the people filling out the petitions were repeatedly making calculation errors. It was our goal at data entry to capture every petition variable as closely as possible to the way it appeared on the petition, regardless of any obvious errors. At the analysis stage, the goal was to employ robust methods such that petition errors did not affect the evaluation of the policy.

IV. Post Data Processing Verification and Continuing Next Steps

In order for E&Y to perform the quality review sample processing on the petition data entered, two kinds of review were carried out [9,10,11]. One part of the daily review focused directly on the repayability ratio while a second broader review focused on other parts of the data entry process.

An Excel file was created for each schedule, as well as the day's control file. This file was then uploaded to the Visa Bankruptcy Bulletin for E&Y's daily retrieval. The following day, E&Y would fax back a list of petitions. The number requested depended on how many had been sent to them the day before, usually 10-15 petitions. Once the fax was received, a staff member would retrieve and copy each petition to send overnight to E&Y for analysis.

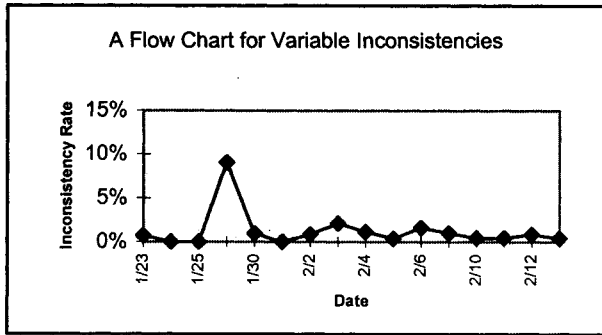
The first part of the daily review focused directly on the repayability ratio. After the re-entering of data for the applicable fields, a computer matching of fields was performed. Upon consulting the original petitions, the discrepancies were reconciled and the data were corrected, if needed. E&Y counted and tracked the inconsistencies on a petition, variable and keystroke level. The review was looking for systematic patterns in inconsistency rates and to check for any discernible effect on the repayability calculations.

A second broader daily review of the sample of petitions focused on other parts of the data entry process. The aim was to spot check for potential errors without re-entering every variable. For each day's sample, each of the schedules on the petition was reviewed twice at random.

Quality Review Results

Inconsistencies were counted on a petition, variable and keystroke level. Run charts were produced regularly to display error rates by day. Here is an an

example of a typical run chart for variable inconsistencies.



The estimated error rate at the keystroke level was 0.51 %. The teamwork was a vital part of assuring the quality of the data. It was observed that the data were more flawed once daily QA was not performed and required more post-processing after the fact to ensure the quality of data.

V. Conclusion

We believe this system to be useful and applicable for future data capture endeavors. This system has proven that it is possible to put together a high quality temporary staff, to complete such an undertaking in a short time frame with a limited resources, and to allow for constant input and monitoring from the client while still producing a high quality output. We had six weeks, to enter 2,220 petitions. We implemented a one-pass, flexible, modifiable system to complete the project.

Notes and References:

- [1] Lunquist Consulting was started by Chris Lundquist in 1989. Projects include prior petition studies, annual bankcard issuer surveys, and numerous debtor surveys, custom programming, as well as local area network management. The Economics Consulting and Quantitative Analysis Group is a part of EY/ECON of Ernst & Young LLP, Washington, DC.
- [2] Ernst & Young LLP. (1998) "Chapter 7 Bankruptcy Petitioners' Ability to Repay: the National Perspective, 1997." T. Neubig, F. Scheuren, G. Jaggi, and R. Lee. (March).
- [3] Ernst & Young LLP. (1998) "Chapter 7 Bankruptcy Petitioners' Ability to Repay: Additional Evidence from Bankruptcy Petition Files." T. Neubig, F. Scheuren, G. Jaggi, and R. Lee. (February).
- [4] Ernst & Young LLP. (1998) "Chapter 7 Bankruptcy Petitioners' Ability to Repay: Supplemental Research Results and Methodological Description." T. Neubig, F. Scheuren, G. Jaggi, and R. Lee. (October).
- [5] Towne, R., et al. (1998). "Methodology and Results from the 1997 Bankruptcy Petition Survey," (in preparation).
- [6] Barron, J. and M. Staten. (1997) "Personal Bankruptcy: A Report on Petitioners' Ability-to-Pay," mimeo. Credit Research Center, Georgetown University. (October).
- [7] Lundquist, C. and Lundquist, D. (1998) "The Petition Entry Program," (working paper).
- [8] Falk, E., and Scheuren, F. "Model-Based Estimation in Skewed Populations," talk given at George Mason University on April 17, 1998.
- [9] Mulrow, J. and Scheuren, F. (1996) "Measuring To Improve Quality and Productivity In A Processing Environment," *Data Quality*.
- [10] Batcher, M., and Scheuren, F. (1997) "CATI site Management in a Survey of Service Quality," *Survey Measurement and Process Quality*, Wiley Series in Probability and Statistics.
- [11] National Statistics Information and Library Service (NSILS). (1997) *Statistical Quality Checklist*, Government Statistical Service, London.