Do Changes in Chapter 7 Asset Exemptions Fundamentally Alter Bankruptcy Outcomes? New Evidence From the State of Oregon

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Hackney, Friesner, and McPherson (2018) developed a methodology to identify the optimal distribution of discharged debts in Chapter 7 bankruptcy filings. In 2013, Oregon adopted debtor-choice status. Applying the methodology to data from Oregon immediately before, during, and after, the conversion to debtor choice status should facilitate an accurate assessment of the impact of debtor-choice status on the distribution of debt disbursements. The results suggest that the optimal proportion of assets retained by households through exemptions is between 3-4% of all disbursements, and that the legislation did not noticeably impact convergence to this optimum proportion.

Keywords: consumer bankruptcy, asset exemptions, debtor choice provisions, spreadsheet modelling

INTRODUCTION AND LITERATURE REVIEW

Bankruptcy is an important, and highly politicized, form of social insurance (Sullivan, Warren, & Westbrook, 1988, 197; Grochulski, 2010; Hackney, Friesner, & Johnson, 2016). It is most appropriately used when households (or individuals) experience major, unanticipated events (i.e., job loss, serious injury, etc.) that fundamentally reduce a household's ability to meet outstanding debt obligations and/or to maintain a positive household cash flow. In such cases, filing for protection under the U.S. Bankruptcy Code allows these households to relieve (or, in some cases, restructure) the household of their debts and re-establish themselves financially.

Most households in the United States file for bankruptcy protection under one of two primary chapters of the U.S. Bankruptcy Code: Chapter 7 and Chapter 13 (Power, 2007; Hackney & Friesner, 2015). Under a Chapter 7 filing, the household discloses its assets, liabilities, income, and demographic characteristics to the Court. All liabilities are prioritized, with trustees and other Court representatives being accorded highest priority, followed (in order) by secured creditors, priority unsecured creditors (i.e., child support, alimony expenses, tax obligations etc.), and unsecured creditors. Asset cases, those with assets to distribute in excess of exemptions, are a very small minority of all Chapter 7 filings (Jiminez, 2009). The bankruptcy debtor has little incentive to pay general unsecured creditors, and the debtors, with

the assistance of bankruptcy counsel, will seek to structure their filing so as to fully maximize their exemptions and minimize non-exempt assets. Assets are subsequently classified as exempt from the bankruptcy process (and retained by, or disbursed to, the debtor) or non-exempt. Non-exempt assets are liquidated and used to repay creditors in order of priority. A small variety of debts are non-dischargeable (some taxes, child support etc.), but most debtors are essentially debt free upon receipt of their discharge. As noted in the Grogan v. Garner case, the result achieves the stated public policy purpose "to give the honest debtor a fresh start" (United States Supreme Court, 1991). Chapter 13 filings, commonly called "wage earner plans", are limited to natural persons and households with debts within certain inflation adjusted upper limits, and the debtor, as well, must demonstrate a regular source of income. The Chapter 13 Trustee differs from the Chapter 7 Trustee, in that they do not function as a non-exempt asset liquidator. The Trustee may require a debtor to surrender a secured luxury good (i.e. snowmobile or jet ski). The purpose here would be to improve the debtor's cash flow for funding a payment plan. As in Chapter 7 cases, the Chapter 13 debtor files schedules listing assets, liabilities, income and expenses and other general demographic information. The debtor, after reasonable household expenses, must commit net disposable income to fund a plan, between 36 and 60 months in duration that repays creditors in order of priority (Loibl, Hira, & Rupured, 2006; Norberg & Compo, 2007). Any (lower priority) liabilities that cannot be funded by the repayment plan are typically discharged. As a practical matter, the vast majority of Chapter 13 plans may not provide full payment to unsecured creditors, but they do provide a strategy for Chapter 13 debtors to protect non-exempt assets from liquidation.

Clearly, a tradeoff exist between the two filing plan choices. Chapter 7 requires the debtor to part with non-exempt assets in exchange for immediate debt discharge and the ability to immediately begin re-establishing itself financially. Chapter 13 is preferable if the household wishes to retain its assets, and is willing to do so by funding a payment plan, which delays re-establishing itself financially until the terms of the payment plan are met. The U.S. Bankruptcy Code allows most households to file under Chapter 13. Under 11 U.S.C. Sec. 109(e), the Chapter 13 debtor is limited to a total unsecured debt not exceeding $419,725.00 and secured debt not exceeding $1,257,850.00. These sums are periodically adjusted for inflation. Households may only file under Chapter 7 if i) they have not previously filed for bankruptcy protection in the last 8 years; and ii) after adjusting for family size, the household's income is less than the median income (again, adjusted for family size) in the state in which the household resides at the time of filing (Power, 2007; Hackney & Friesner, 2015; Hackney, Friesner, & McPherson, 2018). The latter is commonly referred to as the "means test" and is intended to serve as a rough proxy for a household's ability to repay some or all of its debts. Those failing to pass the means test are presumed to have the ability to repay some or all of their debts. The debtor not passing the "means test", and not being exempted, will have to either file Chapter 13 or elect a non-bankruptcy solution to their financial quandary.

Implicit in these decisions and legal requirements are the presumptions that exempted assets in a Chapter 7 filing are appropriate, precisely identified, and ensure that the bankruptcy process creates a socially optimal redistribution of wealth from creditors (many of whom go unpaid) to debtors (many of whose debts are discharged without repayment). If these presumptions are not met, it may be possible for debtors to use these exemptions to shield too many (or too few) assets from liquidation, creating a social welfare loss (Hackney, Friesner, & McPherson, 2018). The difficulty with these presumptions that that no universal list of exemptions exist that consistently apply to all bankruptcy filers. In 36 states, there are exemptions set by the state that are specific to debtors in that state. The remaining 14 states and the District of Columbia, not only have state specific requirements, but also allow debtors to choose between following the state's exemptions and those established by the Federal government (Jiminez, 2009). The latter are frequently termed "debtor choice states". Since households filing for Chapter 7 bankruptcy in debtor choice states can choose between state and Federal guidelines, it is alleged that filers in debtor choice states shield a greater dollar value of assets from liquidation than in non-debtor choice states, possibly exacerbating the social costs of bankruptcy. This allegation is based upon the fact that the Federal exemptions are almost always more generous than comparable state exemptions, and provide

more options and opportunities for debtors to exempt all their assets, and deny any dividend to the creditors. This manuscript focuses on asset exemptions in Chapter 7 filings.

The literature on consumer bankruptcy, and the chapter filing decision, is robust (see, for example: Sullivan, Warren, & Westbrook, 1997; Fay, Hurst, and White, 2002; Lefgren and McIntyre, 2010; Zhu, 2011). However, the literature attempting to quantify the optimal distribution of debts in consumer bankruptcies, especially those in Chapter 7 asset cases, is less well-developed. The first comprehensive attempt to address this issue was made by Athreya (2006), who built a theoretical model, as well as a simulation model based on the theory, to characterize the welfare effects of asset exemptions. The author found that a u-shaped relationship exists between asset exemptions and unsecured debt acquisition. Low exemptions discourage individuals from accumulating substantial unsecured debt. Additionally, low, but more generous exemptions induce households to avoid unsecured debt markets and save more, which reduces the likelihood of bankruptcy. Eventually, as exemptions increase, the costs of bankruptcy to the household are reduced, and unsecured debt increases. Taken cumulatively, Athreya finds a small, positive welfare-enhancing effect from asset exemptions.

While an important first step in understanding the impact of asset exemptions on social welfare, Athreya's (2006) analysis is limited in several respects. First, the author builds a simulation that is national, rather than state specific. As a result, variations in causes and consequences of bankruptcy across states, which are crucial in examining this phenomenon, are ignored. The author also focuses only on homestead exemptions (rather than all exemptions), and makes no distinctions between debtor choice and non-debtor choice states. Similarly, no distinctions between Chapter 13 or 7 filings, nor the antecedents or causes of the chapter filing decision, are made. Lastly there is only a limited discussion of the "optimal" amount of debt discharged or the "optimal" amount of asset exemptions.

More recent research – for example, see Grochulski (2010) and the citations therein – has further developed the theoretical underpinnings of the relationship between consumption, bankruptcy, and asset exemptions. However, empirical studies identifying the optimal distribution of debts discharged in consumer bankruptcy filings in debtor choice versus non-debtor choice regimes, especially at a regional or local level, remain sparse. One notable exception is Jiminez (2009), who characterizes the distribution of assets liquidated and disbursed in Chapter 7 asset case filings. Unfortunately, the author says little about whether this distribution is optimal from the perspective of one or more stakeholders (i.e., social, the bankruptcy filer, creditors, etc.) in the process. Moreover, the author does not fully examine whether and how the distribution of assets differs across states/regions, which may have different allowed asset exemptions.

In a recent manuscript, Hackney, Friesner, and McPherson (2018) provided a simple empirical methodology to identify, in a relative sense, the optimal distribution of debts (across multiple categories of debts, including asset exemptions) that should be discharged in Chapter 7 asset cases. The authors apply their methodology to data collected from 9 western U.S. states comprising the Ninth Federal Court District in 2010. Their findings were three fold. First, the "optimal" level of asset exemptions should be approximately 9 percent of total disbursements. Second, most states deviate from this optimum, indicating that some state's exemptions are too liberal (allowing too many assets to be retained by the debtor), while others are too strict. The magnitude of these deviations from the optimal benchmark were relatively modest, generally deviating less than 8 percent from the optimal benchmark. Third, no evidence was found to suggest that debtor choice states allowed relatively greater asset retention by debtors than non-debtor choice states. This suggests that other factors (such as the nature of assets debtors hope to retain, household consumption patterns, changes in employment status, economic conditions in the local economy, etc.) are more important determinants of disbursements in Chapter 7 asset cases than simply the availability of asset exemptions within a particular state.

While interesting, the previous study is also limited in several major ways. First, Friesner, Hackney, and McPherson (2018) used aggregate (state-level) data to identify the optimal distribution of debt disbursements. This assumes that states are comparable in important socio-economic characteristics that drive the bankruptcy filing decisions (Zhu, 2011; Hackney and Friesner, 2015). Empirical analyses using data drawn from a single state are more likely to meet this assumption. Second, their methodology

assumes that state-specific asset exemption provisions are comparable across states. If they are not comparable, an optimal distribution of debt disbursements in one state may not apply to those in other states, especially if an "optimal" distribution of disbursements is prohibited by state asset exemption guidelines. An assumption of comparable asset exemptions is more appropriate when analyzing data drawn from a single state, where all filers are subject to the same set rules and regulations governing the Chapter 7 bankruptcy filing process.

The State of Oregon provides a unique natural experiment to address many of the shortcomings of the Hackney, Friesner, and McPherson (2018) analysis. Oregon has traditionally operated as a non-debtor-choice state. However, in 2013, the State legislatively adopted SB 396, which facilitates debtor-choice status (see: https://www.oregonlegislature.gov/bills_laws/lawsstatutes/2013orLaw0597.pdf). Applying the Hackney, Friesner, and McPherson (2018) methodology to Chapter 7 asset case bankruptcy data from Oregon immediately before, during, and after the conversion to debt-choice status, should provide a comparable set of information with which to assess whether debtor-choice status impacts the distribution of debt disbursements (and by extension, social welfare loss) in Chapter 7 bankruptcy filings.

The primary objective of this manuscript is to utilize data drawn from Chapter 7 bankruptcy filing asset cases in the State of Oregon to determine the optimal distribution of debts discharged, including assets retained by the debtor/household. In doing so, it may be possible to determine whether the conversion to a debtor choice state allowed those filing for Chapter 7 bankruptcy with assets to shield relatively more of those assets from creditors and other stakeholders, compared to previous years when filers in Oregon had no choice of asset exemptions.

The remainder of this manuscript proceeds as follows. In the next section, the Hackney, Friesner, and McPherson (2018) methodology is summarized. The third section describes the data used in the study, while the fourth section describes the results of the modelling exercise. The final section concludes the paper by summarizing its findings, discussing how those findings might inform new policies to improve the consumer bankruptcy process, identifying study limitations, and suggesting new opportunities for future work in this area of study.

METHODOLOGY

The analysis employs the methodology developed in Hackney, Friesner, and McPherson (2018) as its starting point. We briefly review their methodology below, drawing variable names, definitions and notations verbatim from their work. The interested reader is referred to Hackney, Friesner, and McPherson (2018) for a full description of their methodology.[2]

In the absence of objectively determined optimal values, they must be computed using benchmarking techniques. A myriad of benchmarking techniques exist in the literature (Anderson, Sweeney, & Williams, 2000; Ozcan 2009). Friesner, Hackney and McPherson (2018) argue that an appropriate technique should be flexible, emphasize parsimony, be employed using small or large datasets (which may or may not have well-defined statistical properties), be accepted in the quantitative management science and econometric literatures, and be implemented using software (such as Microsoft Excel) that is available to both applied practitioners and researchers. As a final consideration, Friesner, Hackney and McPherson (2018) argue that the distribution of debt disbursements should be examined on a proportional, rather than total dollar, basis. That is, for every dollar of debt disbursed in the bankruptcy process, the focus of interest is the proportion of that dollar that is allocated to a particular stakeholder (i.e., a creditor, Court administrators, the debtor, etc.). By focusing on the proportional allocation of disbursements, filers who present with different sets of assets and outstanding debts are directly comparable. Additionally, proportions are stated in non-monetary units, which allows direct comparisons of filers across different time periods. Once optimal proportions have been identified, these proportions can easily be converted back to monetary terms.

Given those considerations, the authors postulated a nonlinear programming problem of the following form:

$$minimize_{w_1,\ldots,w_S} \sum_{i=1}^{S} \sum_{j=1}^{T} \left(w_i p_{ij} - \rho_j\right)^2$$

$$subject\ to:\ \rho_j = \sum_{i=1}^{S} w_i p_{ij}$$

$$0 \leq w_i \leq 1\ \forall\ w_i$$

$$\sum_{i=1}^{S} w_i = 1 \tag{1}$$

where i = 1,..., S denotes each year (2009-2017); j = 1,..., T denotes each category of debt repayment, and p represents the proportion of total payments (for year i) in category j. If $0 \leq p_{ij} \leq 1$ and $\sum_{i=1}^{S} p_i = 1$ for each year and debt category, the following restrictions are implicitly enforced through the model and its solution:

$$0 \leq \rho_j \leq 1\ \forall\ \rho_j$$

$$\sum_{j=1}^{T} \rho_j = 1$$

$$\sum_{i=1}^{S} \sum_{j=1}^{T} w_i p_{ij} = 1 \tag{2}$$

Essentially, the empirical model chooses a set of weights for each debt category/year (using the year as the means to determine the weights) to minimize the sum of squared errors around an optimum benchmark proportions (ρ_j) of payments for that debt category. Deviations from the benchmark proportion (ρ_j) in a given category identify distributions that exceed or undershoot the benchmark, and are not optimal. Using simple arithmetic, the benchmark proportions can also be converted to a nominal dollar values. Using the consumer price index to convert nominal dollar values to real dollar values allows for a comparison (on an aggregate basis as well as on a per bankruptcy case basis) of optimal disbursements and actual disbursements in each category. Since we are comparing a single state over a relatively short time period, these disbursements allow for a direct and meaningful comparison of how a change from a non-debtor choice state to a debtor choice state impacts the amount of disbursements overall and to different stakeholders (i.e., the debtor, court administrators, and his/her creditors).

One potential limitation of the Friesner, Hackney and McPherson (2018) is that the authors treat their empirical application as an exercise in non-statistical benchmarking. As such, no hypothesis tests were performed. In this analysis, simple hypothesis tests are conducted, treating the benchmarking exercise as exploratory. As such, we have no prior expectations, whether overall, by year, or by debt category, about the optimal distribution of debts. Given these considerations, this analysis employs a null hypothesis that no systematic differences exist in any relationship concerning the distribution of debt disbursements, or disbursements over time, or the combination of the two.

Identifying an appropriate statistical test can be challenging, since the nonlinear programming algorithm seeks to minimize (a weighted average) of the differences between observed and optimal proportion of debt disbursed in each category. This precludes the use of many traditional tests, such as analysis of variance or the chi-square test of homogeneity. Instead, to test for statistical significance in one dimension of interest (either time or debt disbursement categories) we apply an adaptation of the median sign test. More specifically, we identify the count of instances (aggregated over the other dimensions of interest not being tested) where a particular observed proportion exceeds its optimal value. Under a random assignment of proportions in a given category, we would expect half of the cells being counted to exceed the optimum proportion and half to fall below it. Chi-square tests can be applied to test

whether the observed counts deviate significantly from its (median) expected value. To assess the joint relationship between time and debt disbursement, we again identify counts of instances where a particular observed proportion (in any give year and for any given debt disbursement category) exceeds its optimal benchmark. We use this information to create a 2x2 cross tabulation, where the rows aggregate the counts over the years (2009-2012, and 2013-2017, respectively), and the columns aggregate the counts based on debt disbursement categories (secured, unsecured, and priority creditors versus all other categories). A McNemar (chi-square) test can be applied to assess the relationship between time and debt categories. All calculations are performed using Microsoft Excel and employ 5 percent significance levels.

DATA

This study utilizes data drawn from the final trustee reports for Chapter 7 filings made public through the U.S. Trustee Program's website: https://www.justice.gov/ust/bankruptcy-data-statistics/chapter-7-trustee-final-reports. We consider data drawn from the State of Oregon during the period 2009 to 2017 (the latter being the most recent year available for analysis), which provides an even window surrounding the adoption of debtor-choice status (4 years prior to 2013, and 4 years afterwards).[3]

The data contain information on all Chapter 7 asset case filings in Oregon that were successfully closed in a given year. De-identified data are also available, both at the level of the individual filing and on aggregate, characterizing the dollar value of debt disbursements in one of seven mutually exclusive and collectively exhaustive categories: debtor exemptions, debtor/3rd party disbursements, unsecured creditor disbursements, secured creditor disbursements, disbursements to court administrators, disbursements to resolve prior bankruptcies (which may occur when a filer converts a filing under a different Chapter of the U.S. Bankruptcy Code – typically Chapter 13 – to a Chapter 7 filing), and disbursements to priority creditors (i.e., those owed spousal support, child support, unpaid taxes, etc.).

To ensure comparability across each case in the dataset, this analysis examines the distributions of debt disbursements as the proportion of total debt disbursed that falls into a particular debt category. The availability of information that shows the distribution of debt disbursements at the individual level, as well as aggregated totals at the state level, presents an interesting opportunity to investigate our study's objective from multiple perspectives. One approach is to calculate these proportions uniquely for each debtor's case, and take the mean of proportions across all debtors in a given year. The alternative is to sum the dollar value of disbursements for each category in a given year, and use the information to calculate proportions of disbursements in each category. The latter reflects aggregate averages and total disbursements in the state, while the former reflect individual level trends. This distinction between the two types of data are important to note. Policy analysis and legislative change tend to focus on aggregated state-level averages, which reflect total debt discharge and social welfare loss. On the other hand, the individual debtor is more interested in individual level data, aggregated to an average across the state (i.e., the expected outcome for the "typical" individual Chapter 7 filing). In an ideal world, debtors present with very similar total amounts of debt, as well as distributions of debt across each major debt category, which leads to very little difference between the state-level, aggregated averages, and those obtained by taking the mean of individual level filings. But if this is not the case, and the data contain a small number of cases with very skewed amounts of discharged debts in one or more categories, the results of the analysis will differ depending on the data utilized. We equate such differences to the perspective of the analysis (at the policy-making level, or the level of the filer), and we apply the methodology twice, once for each method of calculating the proportion of debt disbursements falling into a given category.

The data do not contain individual household demographics; however, as long as the analysis focuses on a single state, and that state's demographics have not changed substantially over the 8-year time window, this lack of data is not of substantial concern, as minor differences across households filing for bankruptcy within a single state should "average out" over the evaluation window. Lastly, because the data are drawn from publicly available sources, and the data were de-identified prior to placing them in the public domain, the analysis does not constitute human subjects research and does not require Institutional Review Board approval.

RESULTS

Table 1, Panel A describes the variables used in the analysis, as well as descriptive statistics (i.e., means and proportions) for each of these variables. The number of closed Chapter 7 asset cases varies considerably over the time frame of the analysis. In 2009, there were 1,481 cases, a number that rose steadily to 1,911 cases in 2011. In 2012, the number of cases fell to 1,068, but rebounded to 2,416 in 2013. The number of closed cases in 2014 was 1,610; subsequently, cases steadily declined until 2017, when only 418 cases were closed. The trends in cases mirror changes in the local economy. The period 2009-2011 was a substantial recessionary period, causing unemployment and economic uncertainty. It is therefore unsurprising to find that a greater number of lower income households (who qualify for a Chapter 7 filing) declared bankruptcy. The sharp decline in cases in 2012, followed by an equally large spike in 2013, is likely due to the legislation (SB 396) that converted Oregon to a debtor choice state. Filers who would benefit from using Federal exemptions likely delayed filing (and closing) under Chapter 7 until the law took effect. The time frame from 2015-2017 is one of economic recovery and expansion, as well as increased employment. This likely leads to fewer financially distressed households and fewer Chapter 7 asset cases.

Table 1, Panel A also characterizes the total amount of debt disbursements across each of the seven categories. All nominal dollar values in the panel are converted to real, 2009 U.S. dollars using the consumer price index for all items and all urban consumers. It is important to note that if a debtor retains an asset through an exemption, the Court essentially releases the asset, disbursing it to the debtor. The distributions of assets are consistent with the literature (Jiminez, 2009). Secured creditors receive the largest share of disbursements, especially during the period 2014-2017 where total disbursements range from approximately $10.1 million to $30.4 million. Unsecured creditors also receive a substantial total dollar value of disbursements, ranging from approximately $4.2 million (in 2012) to $11.9 million (in 2009). Interestingly, between 2009 and 2013, unsecured creditors received the largest total dollar value of disbursements, but were surpassed by secured creditors in 2014. Disbursements to Court administrators represent the third largest total dollar value, ranging from $3.7 million (in 2012) to 16.2 million (in 2014). The remaining categories exhibit relatively modest total values of disbursements, with total dollar values generally below $2 million per year. It is also interesting to note that in 2014, there was a large, one-time spike in the total dollar value of disbursements to address prior bankruptcy filings ($2.4 million). This may also be due to filers attempting to taking advantage of the changes created by SB 396 by refiling for bankruptcy under Chapter 7.

Perhaps more interesting are the proportional distributions of disbursements in a given year across each of the seven categories. As discussed above, there are two approaches to calculating the proportional distribution. The first (which takes an aggregate, policy oriented perspective) is to use the aggregate totals presented in Panel A, and divide each disbursement category by Nominal Gross Receipts (i.e., the sum of all total dollar disbursements in each of these categories) in that year. Table 1, Panel B, presents these proportions. Unsecured creditors represent the largest proportion of disbursements (at between 30 to 40 percent) from 2009 to 2013, after which the proportion declines. Concomitantly, the proportion of disbursements accruing to secured credits ranges between 18 and 29 percent from 2009-2013, and increases substantially between 2014-2017. The proportion accruing to Court administrators remains consistent at between 20-30 percent of disbursements over the entire evaluation window. Proportions for the remaining categories are generally less than 10 percent, and are stable throughout the entire time period of analysis.

The second approach is to calculate these proportions for each individual filing, and take a mean of these individual proportions (for a given category of disbursement). This perspective reflects the typical experience of the filer. Table 1, Panel C reports these proportions. These proportions differ substantially from those in Table 1, Panel B. Secured creditors only receive about 2 percent of disbursements in 2009, and this proportion climbs steadily to approximately 13 percent over the evaluation window. Unsecured creditors, on average, receive approximately 54 percent of disbursements in 2009, and this proportion gradually declines to approximately 42 percent in 2017. However the proportion accruing to Court

administrators remains between 27 and 30 percent throughout the time frame of the analysis. The proportions for the remaining categories are, again, generally less than 10 percent, and are stable throughout the entire time period of analysis.

Comparing Panels B and C yield several inferences. First, there is a skewed distribution of asset disbursements in the dataset. A few debtors file with a large dollar value of assets, which are eventually disbursed to secured creditors. However, the typical Chapter 7 asset case filing disburses relatively little of the proceeds to secured creditors. The opposite is true for unsecured credit. Most filings distribute nearly half of disbursements to unsecured creditors, while a few cases with large total dollar value of disbursements do not distribute as much to unsecured creditors. Second, the Court administrators collect nearly 30 percent of all disbursements, regardless of the total dollar value disbursed. Third, debtor themselves retain only a small proportion of disbursements, no matter how the proportions are calculated. Debtor exemptions range between 3 to 7 percent of total disbursements.

Table 2 presents the optimal proportion of disbursements for each category based on the Friesner, Hackney and McPherson (2018) methodology. Panel A describes the simulation results for proportions created based on aggregate totals of debt disbursements. Examining the year specific weights, note that filings submitted in 2011 constitute nearly 46.5 percent of the optimal debt distribution. The 2014 filing year contributes 22.1 percent, while 2013 (the year in which SB 396 was passed) contributes 18.3 percent of the optimal. 2010 and 2017 contribute 7.0 and 6.2 percent, respectively to the composition of the optimal distribution of debts. This implies that the years 2011, 2014, and 2013 are, in order, closest to the optimum debt distributions.

Table 2, Panel A also identifies the optimal distribution of debt disbursements based on data from aggregate totals of disbursements. Unsecured creditors, at the optimum, receive 29.2 percent of disbursements, followed closely by unsecured creditors (25.8 percent) and Court administrators (24.0 percent). Debtor 3rd Parties receive 8.5 percent, while 6.4 percent of disbursements are optimally allocated to priority creditors, and 1.7 percent to prior bankruptcy filings. At an optimum, the debtor claims only 4.4 percent of disbursements through the exemption process.

TABLE 1
TOTAL RECEIPTS AND DISBURSEMENTS BY YEAR

Panel A: Aggregate Totals (Real, 2009 Dollars)

Gross Receipts	Debtor Exemptions	Debtor/3rd Party Disbursements	Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
$29,323,339.73	$897,560.07	$1,908,426.18	$5,101,973.87	$13,731,131.47	$5,979,370.31	$398,741.10	$1,304,555.22
$50,000,354.63	$1,007,302.36	$1,547,660.70	$4,836,406.92	$30,494,021.22	$10,378,693.22	$863,191.65	$873,040.12
$28,509,662.42	$656,501.39	$1,153,512.51	$6,847,970.51	$10,079,048.06	$7,893,618.35	$762,287.18	$1,116,724.42
$53,112,738.18	$1,000,775.41	$3,066,605.84	$8,484,669.62	$19,698,856.94	$16,241,031.18	$2,419,670.46	$2,201,116.51
$27,871,289.97	$1,217,358.52	$1,998,608.98	$9,154,164.29	$6,427,048.29	$6,839,677.18	$240,382.58	$1,994,016.98
$14,332,806.02	$618,233.58	$566,483.35	$4,196,780.80	$4,298,290.94	$3,710,085.44	$133,798.56	$809,063.27
$22,064,025.41	$1,227,700.44	$2,447,140.13	$7,817,113.98	$4,003,625.12	$4,682,873.99	$194,915.81	$1,690,662.39
$21,397,747.75	$1,294,036.39	$1,112,128.35	$6,494,943.32	$6,347,351.81	$4,906,507.53	$138,813.46	$1,103,966.48
$29,918,904.31	$1,275,996.76	$1,245,682.97	$11,916,137.10	$7,397,951.59	$6,458,717.27	$241,015.24	$1,383,343.44

Panel B: Proportional Distribution of Gross Receipts - Based on Aggregate Data
Proportion of Total Payments to:

Debtor/3rd Party Disbursements	Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
0.0651	0.1740	0.4683	0.2039	0.0136	0.0445
0.0310	0.0967	0.6099	0.2076	0.0173	0.0175
0.0405	0.2402	0.3535	0.2769	0.0267	0.0392
0.0577	0.1597	0.3709	0.3058	0.0456	0.0414
0.0717	0.3284	0.2306	0.2454	0.0086	0.0715
0.0395	0.2928	0.2999	0.2589	0.0093	0.0564
0.1109	0.3543	0.1815	0.2122	0.0088	0.0766
0.0520	0.3035	0.2966	0.2293	0.0065	0.0516
0.0416	0.3983	0.2473	0.2159	0.0081	0.0462

Panel C: Proportional Distribution of Gross Receipts - Based on Mean of Individual Case Filing Proportions
Mean Proportion of Total Payments to:

Debtor Exemptions	Debtor/3rd Party Disbursements	Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
0.0286	0.0234	0.4195	0.1337	0.2840	0.0027	0.1080
0.0323	0.0195	0.4427	0.1076	0.2987	0.0033	0.0960
0.0453	0.0182	0.4777	0.0352	0.3079	0.0023	0.1134
0.0476	0.0171	0.4919	0.0174	0.2987	0.0025	0.1249
0.0550	0.0136	0.5318	0.0147	0.2806	0.0013	0.1030
0.0553	0.0184	0.5499	0.0127	0.2704	0.0018	0.0915
0.0665	0.0180	0.5512	0.0123	0.2586	0.0006	0.0927
0.0531	0.0168	0.5705	0.0141	0.2713	0.0009	0.0734
0.0765	0.0156	0.5378	0.0203	0.2720	0.0017	0.0762

TABLE 2
SIMULATION RESULTS

Panel A: Proportional Distribution of Gross Receipts - Based on Aggregate Data

Year	Optimal Year Weights	Debt Disbursement Category	Optimal Proportion	Objective Value at the Optimum
2017	0.0616	Debtor Exemptions	0.0441	1.6313
2016	0.0000	Debtor/3rd Party Disbursements	0.0851	
2015	0.0000	Unsecured Creditors	0.2920	
2014	0.2208	Secured Creditors	0.2579	
2013	0.1828	Court Administrators	0.2396	
2012	0.0000	Prior Bankruptcies	0.0170	
2011	0.4654	Priority Creditors	0.0642	
2010	0.0695			
2009	0.0000			

Panel B: Proportional Distribution of Gross Receipts - Based on Mean of Individual Case Filing Proportions

Optimal Year Weights	Debt Disbursement Category	Optimal Proportion	Objective Value at the Optimum
0.5967	Debtor Exemptions	0.0311	2.2153
0.3303	Debtor/3rd Party Disbursements	0.0217	
0.0638	Unsecured Creditors	0.4315	
0.0092	Secured Creditors	0.1177	
0.0000	Court Administrators	0.2905	
0.0000	Prior Bankruptcies	0.0029	
0.0000	Priority Creditors	0.1045	
0.0000			
0.0000			

Panel B of Table 2 conducts a similar analysis, using proportions created using individual filings, subsequently aggregated using the sample mean. The results are starkly different from those obtained using aggregated filings. Filings submitted in 2017 constitute nearly 60.0 percent of the optimal debt distribution. The 2016 filing year contributes 33.0 percent, while 2015 and 2014 contribute 6.4 and 0.9 percent, respectively to the composition of the optimal distribution of debts. The remaining years contribute nothing to the formation of the optimal debt distribution. This suggests that from the perspective of the individual filer, the passage of SB 396, and Oregon's conversion to a debtor choice state, fundamentally changed the nature of optimal outcomes arising from the Chapter 7 asset case bankruptcy process.

Panel B also identifies a very different optimal distribution of debt disbursements. Unsecured creditors, at the optimum, continue to receive the plurality of disbursements, at 43.15, while Court administrators receive 29.1 percent. Secured creditors receive only 11.8 percent of debt disbursements, while priority creditors receive 10.5 percent. Debtor 3rd Parties receive 2.2 percent and 0.3 percent are allocated to prior bankruptcy filings. At an optimum, the debtor claims only 3.1 percent of disbursements through the exemption process.

Comparing Panels A and B yields a number of interesting inferences. First, when using the "policy lens" to assess the optimal distribution of debt disbursements, no specific time frame, whether before or after the conversion to a debtor choice state stands out as an optimal benchmark. But from the individual filer's perspective, the conversion to debtor choice status led to filings in subsequent years that are much closer to optimal. Second, under both perspectives, unsecured creditors and Court administrators reap the

majority of the disbursements. Under the first scenario representing the "policy level" perspective, secured creditors benefit from considerable debt disbursements. However, under the second scenario – reflecting the perspective of the typical individual filer - they receive very few disbursements. This suggests that there is skewness in the data driven by a few Chapter 7 filings that included substantial secured assets. Third, the optimal distribution of assets distributed to the debtor via the exemption process is relatively constant, at between 3-4 percent, in both scenarios. Thus, while the change to a debtor choice state changed optimal outcomes, and the characterization of the optimum outcome, the debtors themselves do not appear to benefit any more or less under either scenario.

Of additional interest is whether there are any significant deviations from the optimal proportions in any specific category in any specific year, and whether those deviations are statistically significant. Table 3 can be used to examine these issues. Panel A compares observed and optimal debt distributions based on the "policy analysis" perspective, or based on proportions derived from aggregate totals. For the reader's convenience Panel A represents observed (or actual) and optimal debt disbursement proportions. Panel A also presents several chi-square tests that examine the statistical significance of counts – or the number of times in the table that an observed proportion exceeds its optimal value. When actual disbursements exceed optimal disbursements, this stakeholder receives "too large" of a debt disbursement. The tests in Panel A indicate that no significant deviations exist between the observed and optimal proportions when i) examining deviations solely by time; when examining deviations solely by debt disbursement category; or iii) time and category taken jointly. Thus, if there are deviations in any debt category in any given year, they are largely idiosyncratic.

Panel B repeats this analysis, using proportions that are aggregated from individual filings. In this scenario, the results differ slightly from the previous scenario. No significant differences exist by year, or when examining deviations based on the year and debt category, taken jointly. However, when considering only the debt category, there are statistically significant differences. Examination of Panel B can be used to identify which observed debt disbursement categories exhibit proportions that consistently exceed the optimal values. Two debt disbursement categories can be identified in this regard. The first is for unsecured creditors. The optimum proportion of disbursements in 43.2 percent. The observed proportions for this category between 2009 and 2016 exceed this optimum proportion. The second is the debtor exemption category. Its optimal value is 3.1 percent. Examining the observed values, one finds that between 2009 and 2016, the observed values for debtor exemptions also exceed the optimal values. These results suggest that, over the time frame of the current study, both the unsecured creditor receives, and the debtor retains, too many assets compared to what is optimal. However, it is equally important to note that, for both of these categories, the actual and optimal values are converging with the optimal values. In 2009, the proportion of disbursements to unsecured creditors was 53.8 percent, but by 2017 it was 42.0 percent, just below the optimum of 43.2 percent. Similarly, in 2007, the debtor retained 7.8 percent of assets, which slowly decreases to 2.9 percent; again, just below the optimum of 3.1 percent.

As noted in the paper's methodology section, examining the distribution of debt disbursements on a proportional basis is important to ensure comparability over time and across filers. Table 3, panel B suggests that significant deviations from the optimal distribution of debts exist, especially from the perspective of the "typical" individual filer. However, the use of proportions is also less easily interpreted within the context of the bankruptcy process, which collects, assesses and disburses dollar amounts to stakeholders. To that end, consider Tables 4 and 5, which convert the proportional differences between actual and optimal debt disbursements to dollar values. More specifically, for each year and debt category, the difference between observed and actual proportion of debt disbursements is calculated. This difference is subsequently multiplied by the real (2009) dollar value of total disbursements, which gives the total real dollar value of debt that was over or under disbursed to each stakeholder. In essence, these values depict the total magnitude of excess social welfare loss or gain through the debt disbursement process for the entire State of Oregon during the study period. These values are provided in Table 4. Since there are two methods of computing the proportions, there are two sets of calculations. Table 5 contains similar information, but further normalizes these dollar values to a per case basis. Thus, Table 4 looks at these misallocations from a macro level, while Table 5 presents them at a micro, or individual filer, level.

For consistency and completeness, Tables 4 and 5 present these calculations for simulation results based on aggregate totals, as well as based on individual filings, even though no significant deviations between actual and optimal distributions were found for simulation based on aggregate totals.

At the level of the individual filer, and regardless of the means by which the optimal values are imputed, the misallocations of funds range from less than one hundred dollars to a few thousand dollars. The largest redistribution – in the range of $1,000-$2,000 per filing - is from secured to unsecured creditors. However, as noted in Tables 1 and 5, there are between 418 and 2,416 filers per year. Thus, over all Chapter 7 filers with asset cases, the redistribution grows to several hundred thousand to several million dollars per year. As shown in Table 4, there is typically between $1 million and $10 million dollars per year that is misallocated from one stakeholder to another. Clearly, such magnitudes warrant further study to determine feasible means to improve the allocation of these funds.

TABLE 3
COMPARISON OF OPTIMAL AND ACTUAL PROPORTIONS

Panel A: Proportional Distribution of Gross Receipts - Based on Aggregate Data

Year	Debtor Exemptions	Debt/3rd Party Disbursements	Actual Proportion Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
2017	0.0306	0.0651	0.1740	0.4683	0.2039	0.0136	0.0445
2016	0.0201	0.0310	0.0967	0.6099	0.2076	0.0173	0.0175
2015	0.0230	0.0405	0.2402	0.3535	0.2769	0.0267	0.0392
2014	0.0188	0.0577	0.1597	0.3709	0.3058	0.0456	0.0414
2013	0.0437	0.0717	0.3284	0.2306	0.2454	0.0086	0.0715
2012	0.0431	0.0395	0.2928	0.2999	0.2589	0.0093	0.0564
2011	0.0556	0.1109	0.3543	0.1815	0.2122	0.0088	0.0766
2010	0.0605	0.0520	0.3035	0.2966	0.2293	0.0065	0.0516
2009	0.0426	0.0416	0.3983	0.2473	0.2159	0.0081	0.0462
Optimal Proportion of Disbursements per Receipt/Disbursement Category	0.0441	0.0851	0.2920	0.2579	0.2396	0.0170	0.0642

	Prob.
Median Chi-Square test - Count of Above Optimal Proportions by Debt Disbursement Category	0.3583
Median Chi-Square test - Count of Above Optimal Proportions by Year	0.7950
McNemar Chi-Square Test - Counts of Above Optimal Proportions by Year and Debt Disbursement Category	0.7815

Panel B: Proportional Distribution of Gross Receipts - Based on Mean of Individual Case Filing Proportions

Year	Debtor Exemptions	Debt/3rd Party Disbursements	Actual Proportion Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
2017	0.0286	0.0234	0.4195	0.1337	0.2840	0.0027	0.1080
2016	0.0323	0.0195	0.4427	0.1076	0.2987	0.0033	0.0960
2015	0.0453	0.0182	0.4777	0.0352	0.3079	0.0023	0.1134
2014	0.0476	0.0171	0.4919	0.0174	0.2987	0.0025	0.1249
2013	0.0550	0.0136	0.5318	0.0147	0.2806	0.0013	0.1030
2012	0.0553	0.0184	0.5499	0.0127	0.2704	0.0018	0.0915
2011	0.0665	0.0180	0.5512	0.0123	0.2586	0.0006	0.0927
2010	0.0531	0.0168	0.5705	0.0141	0.2713	0.0009	0.0734
2009	0.0765	0.0156	0.5378	0.0203	0.2720	0.0017	0.0762
Optimal Proportion of Disbursements per Receipt/Disbursement Category	0.0311	0.0217	0.4315	0.1177	0.2905	0.0029	0.1045

	Prob.
Median Chi-Square test - Count of Above Optimal Proportions by Debt Disbursement Category	0.0235
Median Chi-Square test - Count of Above Optimal Proportions by Year	0.8992
McNemar Chi-Square Test - Counts of Above Optimal Proportions by Year and Debt Disbursement Category	0.1655

DISCUSSION AND CONCLUSION

The findings of this analysis are threefold. First, over the time period 2009-2017, the optimal proportion of assets retained by households through exemptions of Trustee administered assets is between 3-4% of all disbursements. Disbursements to unsecured creditors, Court personnel, and unsecured creditors represent the groups who, at the optimum, receive the largest proportion of case disbursements. Second, there are distributional differences in the optimal proportion of debt disbursements, depending on whether one uses aggregated statewide averages, or an average of individual-level filings. Using aggregated state-level averages, the proportion of debt disbursements to unsecured creditors, Court personnel, and secured creditors are 29.2%, 24.0%, and 26.0%, respectively. Using individual-level disbursements aggregated to the state level yields percentages of 43.2%, 29.1%, and 11.8%, respectively. Thus, the optimal distribution of debt disbursements depends crucially on the perspective of the analysis. These differences are likely due to a few Chapter 7 filings with very large dollar amounts of assets to be disbursed, which the remainder of asset cases distributing very few assets, or no disbursements whatsoever, which is the case of the overwhelming percentage of non-asset cases (Jiminez, 2009). Third, there are considerable ramifications of failing to disburse funds optimally. These funds range from $1,000-$2000 per debtor, and aggregate to several million dollars per year in the state. Most of the misallocation occurs between unsecured and secured creditors. It is incumbent on policy makers and Court administrators to identify approaches to mitigate this form of inefficiency.

A critical policy issue explored in this manuscript is whether the conversion from a non-debtor choice state to a debtor choice state allowed filers in Oregon to retain more of their assets from creditors and other stakeholders, and in doing so exacerbate the social welfare costs of the bankruptcy process. The results of this analysis indicate that the conversion to debtor choice status did not noticeably impact the proportion of debt disbursements received by the filer through the claiming of exemptions on assets liquidated by the Trustee. In fact, under both simulation scenarios, the proportion of disbursements retained by debtors falls consistently throughout the time period of the analysis. By 2016-2017, the proportion of disbursements claimed by the debtor through the exemption process is at (and in some years, below) its optimal value. Thus, the trend of reduced debtor exemption disbursements was in process before the passing of SB 396, and continued thereafter. More broadly, this analysis concludes that adopting debtor choice state status does not imply that debtors are able to shield greater assets (or more appropriately, that debtors recover greater or fewer exemption disbursements) from creditors and stakeholders, nor does it imply that a social welfare loss results from shielding assets through the exemption process.

The last statement comes with a series of caveats. First, the years during, and after, the implementation of SB 396 do play a prominent role in determining the characterization of the optimum distribution of weights. For the simulation created solely using aggregate level state data, the years 2013 (when SB 396 was passed) and 2014 (the year immediately after passage), collectively contribute over 40% of the information used to characterize the optimum distribution of debt disbursements. If the spreadsheet modeling analysis is based on individual level filings, which are aggregated using the sample mean, the years 2014 through 2017 contribute 100% to the formation of the optimum. So while the passage of SB 396 may not, in itself, be responsible for minimizing debtors' abilities to shield assets through the exemption process, it may provide supporting or background context to indirectly ensure that the proportion of disbursements allocated through exemptions converge to its optimal value.

TABLE 4
DEVIATIONS BETWEEN REAL ACTUAL AND REAL OPTIMAL DOLLAR AMOUNTS

Panel A: Distribution Based on Aggregate Data

Conversion to Real Actual - Real Optimal Dollars

No. Cases	Debtor Exemptions	Debt/3rd Pty. Disbursements	Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
418	$ (396,335.81)	$ (586,679.28)	$ (3,460,054.67)	$ 6,167,885.62	$ (1,047,238.24)	$ (100,737.25)	$ (578,320.56)
551	$ (1,198,969.27)	$ (2,706,839.61)	$ (9,763,037.32)	$ 17,597,639.76	$ (1,602,647.33)	$ 11,511.90	$ (2,337,523.80)
857	$ (601,490.88)	$ (1,272,357.63)	$ (1,476,474.98)	$ 2,725,670.58	$ 1,061,987.32	$ 276,668.58	$ (713,904.47)
1610	$ (1,342,830.51)	$ (1,452,725.33)	$ (7,023,549.58)	$ 5,999,711.47	$ 3,513,885.38	$ 1,514,976.01	$ (1,209,296.13)
2416	$ (12,465.48)	$ (372,942.44)	$ 1,016,115.13	$ (761,676.46)	$ 161,016.22	$ (234,362.31)	$ 204,378.51
1068	$ (14,203.20)	$ (653,086.55)	$ 11,790.44	$ 601,490.48	$ 275,585.20	$ (110,338.92)	$ (111,258.00)
1911	$ 254,122.68	$ 569,725.39	$ 1,374,709.50	$ (1,687,256.28)	$ (604,220.55)	$ (180,911.20)	$ 273,913.16
1898	$ 349,858.21	$ (708,593.23)	$ 247,083.13	$ 828,320.61	$ (220,930.16)	$ (225,664.52)	$ (270,000.51)
1481	$ (44,178.47)	$ (1,300,098.73)	$ 3,180,211.55	$ (318,905.73)	$ (710,603.51)	$ (268,607.64)	$ (537,774.03)

Panel B: Distribution Based on Mean of Individual Case Filing Proportions

Conversion to Real Actual - Real Optimal Dollars

No. Cases	Debtor Exemptions	Debt/3rd Pty. Disbursements	Unsecured Creditors	Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
418	$ (71,589.83)	$ 49,623.19	$ (353,924.74)	$ 468,072.37	$ (190,199.17)	$ (4,142.13)	$ 102,095.43
551	$ 59,909.30	$ (112,236.70)	$ 560,200.68	$ (505,380.19)	$ 406,712.43	$ 19,014.03	$ (428,136.34)
857	$ 406,212.36	$ (100,879.24)	$ 1,317,070.78	$ (2,352,798.04)	$ 495,428.77	$ (16,851.60)	$ 252,121.10
1610	$ 879,608.73	$ (246,613.50)	$ 3,206,265.72	$ (5,330,935.37)	$ 434,033.72	$ (20,857.90)	$ 1,079,018.59
2416	$ 667,269.71	$ (225,004.19)	$ 2,794,531.57	$ (2,872,780.20)	$ (276,624.97)	$ (43,991.20)	$ (43,228.51)
1068	$ 346,641.28	$ (46,998.38)	$ 1,696,218.61	$ (1,505,315.71)	$ (287,771.79)	$ (15,817.97)	$ (187,083.25)
1911	$ 780,869.55	$ (80,909.84)	$ 2,641,433.55	$ (2,325,829.60)	$ (705,442.52)	$ (49,202.58)	$ (260,663.45)
1898	$ 471,929.42	$ (104,461.53)	$ 2,973,076.65	$ (2,218,054.82)	$ (411,703.98)	$ (43,171.42)	$ (667,386.35)
1481	$ 1,357,422.11	$ (183,590.56)	$ 3,181,016.83	$ (2,915,788.74)	$ (555,310.90)	$ (36,309.54)	$ (847,470.40)

TABLE 5
DEVIATIONS BETWEEN REAL ACTUAL AND REAL OPTIMAL DOLLAR AMOUNTS PER CASE

Panel A: Distribution Based on Aggregate Data

Year	No. Cases	Debtor Exemptions	Debtor/3rd Pty. Disbursements	Unsecured Creditors	*Conversion to Real Actual - Real Optimal Dollars*			
					Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
2017	418	$ (948.17)	$ (1,403.54)	$ (8,277.64)	$ 14,755.71	$ (2,505.35)	$ (241.00)	$ (1,383.54)
2016	551	$ (2,175.99)	$ (4,912.59)	$ (17,718.76)	$ 31,937.64	$ (2,908.62)	$ 20.89	$ (4,242.33)
2015	857	$ (701.86)	$ (1,484.66)	$ (1,722.84)	$ 3,180.48	$ 1,239.19	$ 322.83	$ (833.03)
2014	1610	$ (834.06)	$ (902.31)	$ (4,362.45)	$ 3,726.53	$ 2,182.54	$ 940.98	$ (751.12)
2013	2416	$ (5.16)	$ (154.36)	$ 420.58	$ (315.26)	$ 66.65	$ (97.00)	$ 84.59
2012	1068	$ (13.30)	$ (611.50)	$ 11.04	$ 563.19	$ 258.04	$ (103.31)	$ (104.17)
2011	1911	$ 132.98	$ 298.13	$ 719.37	$ (882.92)	$ (316.18)	$ (94.67)	$ 143.33
2010	1898	$ 184.33	$ (373.34)	$ 130.18	$ 436.42	$ (116.40)	$ (118.90)	$ (142.26)
2009	1481	$ (29.83)	$ (877.85)	$ 2,147.34	$ (215.33)	$ (479.81)	$ (181.37)	$ (363.12)

Panel B: Distribution Based on Mean of Individual Case Filing Proportions

Year	No. Cases	Debtor Exemptions	Debtor/3rd Pty. Disbursements	Unsecured Creditors	*Conversion to Real Actual - Real Optimal Dollars*			
					Secured Creditors	Court Administrators	Prior Bankruptcies	Priority Creditors
2017	418	$ (171.27)	$ 118.72	$ (846.71)	$ 1,119.79	$ (455.02)	$ (9.91)	$ 244.25
2016	551	$ 108.73	$ (203.70)	$ 1,016.70	$ (917.21)	$ 738.14	$ 34.51	$ (777.02)
2015	857	$ 473.99	$ (117.71)	$ 1,536.84	$ (2,745.39)	$ 578.10	$ (19.66)	$ 294.19
2014	1610	$ 546.34	$ (153.18)	$ 1,991.47	$ (3,311.14)	$ 269.59	$ (12.96)	$ 670.20
2013	2416	$ 276.19	$ (93.13)	$ 1,156.68	$ (1,189.06)	$ (114.50)	$ (18.21)	$ (17.89)
2012	1068	$ 324.57	$ (44.01)	$ 1,588.22	$ (1,409.47)	$ (269.45)	$ (14.81)	$ (175.17)
2011	1911	$ 408.62	$ 42.34	$ 1,382.23	$ (1,217.07)	$ (369.15)	$ (25.75)	$ (136.40)
2010	1898	$ 248.65	$ 55.04	$ 1,566.43	$ (1,168.63)	$ (216.91)	$ (22.75)	$ (351.63)
2009	1481	$ 916.56	$ (123.96)	$ 2,147.88	$ (1,968.80)	$ (374.96)	$ (24.52)	$ (572.23)

A second caveat is that the current analysis focuses on the dollar value of debt disbursements, and the proportion of total disbursements allocated to the debtor through the exemption process. What the data do not uncover is whether filers are able to use the exemption process to shield *specific assets of personal importance* (albeit of an equivalent dollar valuation), from liquidation. For example, if, under SB 396, a filer can retain a personal heirloom worth $1,000 through the exemption process (and instead liquidate other assets also valued at $1,000), versus a situation prior to the implementation of SB 396 that did not allow the filer this type of substitution, the implementation of the law might create welfare-enhancing effects not addressed in the current manuscript.

Third, examination of Table 1 indicates that the number of filings nearly doubled in 2013 compared to the previous year. Moreover, filings in 2014 were approximately 50 percent higher than in 2012. This suggests that households may have strategically delayed filings until 2013/2014, to utilize debtor choice provisions that were not previously available. This implies a perception on the part of filers that they may have had some underlying rationale, or perceived some benefit, from the passage of SB 396 and Oregon's conversion to a debtor choice state. The data used in this manuscript are insufficient to uncover these rationale, and future research is necessary to address this issue. This caveat and call for future research are especially critical if those filers who strategically delayed their filing i) owned assets that could be exempted (or at higher dollar amounts) under Federal guidelines, and ii) they owned those assets free and clear of encumbrances. As an illustrative example, under Federal exemptions for homesteads (see 11 U.S.C. 522(d)(1); (d)(5)), the debtor may exempt up to $20,000 in real property, and up to $10,125 of the unused homestead exemption may be applied to any property, including cash. Many state exemptions offer the debtor few or no protection for cash assets. Thus, debtors may not shield a greater total dollar value of assets, but the Federal exemptions allow the debtor much more leeway in the types and form of assets that are exempted, giving the debtor a very substantial incentive to delay filing until he or she can use Federal exemptions to retain specific assets of particular interest to the debtor (in this case, cash). This in turn, supports both the second caveat discussed above, as well as the increase in filings (caveat three) concurrent with, and immediately subsequent to, the passage of SB 396. In such cases, these filers would be fundamentally different from other filers in the data set (see endnotes 1 and 2), and the assumptions underlying our methodology may be suspect.

While this study presents some interesting findings, it is intended as an initial, exploratory study. The analysis contains several major limitations, and readers should exercise caution in interpreting and apply our study's findings. Most importantly, our study uses data drawn from one state, with a narrow (9 year) time window. While this allows comparability in implementing our empirical methodology, it simultaneously requires us to characterize this analysis as an exploratory case study. As a result, the study's findings may or may not generalize to other states, and other time frames. Replications of this study in other states, regions or Court districts would provide a valuable and important replication of the current manuscript.

A second limitation is that state specific debtor provisions vary from one state to the next. It may be the case that the ability for households to file under Chapter 7 and shield a sub-optimal amount of assets depends not so much on whether the state is debtor choice or non-debtor choice, but is dependent on whether states allow filers to claim specific types of exemptions in the bankruptcy process. The current analysis does not have sufficiently detailed data to test this assertion. Future research that used more detailed information to answer this question would also improve our knowledge of the benefits, costs and social welfare implications of the Chapter 7 bankruptcy process.

Third, our methodology is limited in that it employs simple spreadsheet modelling techniques and simple hypothesis tests. While these methods are beneficial in that they are accessible to policy makers and practitioners, they are also limited in the depth, breadth and precision of the findings that they can provide to researchers and policy makers. It is important for future research to develop new approaches to quantify the optimal distribution of debt disbursements, especially those than can be implemented using various forms of regression analysis. This would allow for more precise characterization of the optimal distribution. Such methods would also allow for the application of more powerful methods of hypothesis

testing than what is used in this manuscript. Lastly, it would also allow for an examination of the impact of different socio-economic or legal forces on the ability to exploit the asset exemption process.

ENDNOTES

1. This last statement presumes that i) debtors have substantial assets to liquidated; and ii) that exempted assets do not have competing claims on those assets. Jiminez (2009) notes that very few Chapter 7 bankruptcy cases liquidate and distribute assets. Moreover, Chapter 7 bankruptcy is reserved for filers with relatively low incomes. In the authors' experience, Chapter 7 bankruptcies distribute few assets because filers have insufficient incomes with which to accumulate assets. Therefore, there are very few assets with sufficient value to warrant liquidation. For those filers who have accumulated assets that could be liquidated, it is also important to note that the assets must be considered net of encumbrances on the asset (Jiminez, 2009). For example, an individual filer's home may be identified as an exempted asset. However, if the asset has an outstanding mortgage, the balance of the mortgage would be listed in the bankruptcy filing as secured debt. Similarly, other competing claims (overdue taxes, outstanding liens, etc.) also would be reported and incorporated into the bankruptcy process. Since only the net value of the exempted assets could subsequently be shielded from the bankruptcy process, the value of assets that could be shielded via exemptions is relatively low.
2. One assumption made implicitly by Hackney, Friesner, and McPherson (2018), but not discussed in that manuscript, is worth noting here. The authors assume that the totality of debtor resources is identified, and possibly collected and disbursed, by the Court. The debtor has no financial incentive in any course of action that results in having non-exempt assets available for Trustee administration. The system relies upon truthfulness in preparation of the schedules and the accuracy of asset and income disclosures. By extension, their methodology implicitly assumes that the financial disbursements made by the Court are sufficient to characterize (whether on net or on total) the outcomes of the Chapter 7 bankruptcy process. As noted in endnote 1, filers may be able to exempt certain assets from the bankruptcy process. Those assets are either minimal in total value, or they are likely encumbered, making them low in net value. Any encumbrances are listed as debts in the bankruptcy process, and thus accounted for in the process. In extreme cases the Court may require exempt assets to be liquidated, especially if those assets are encumbered. Upon liquidation, competing claims and administrative costs to ensure liquidation and disbursement would be satisfied, and only the remaining monetary amount would be returned to the debtor as an "exemption disbursement". Indeed, as Jiminez (2009) notes, an adept bankruptcy attorney may suggest to potential filers to conduct "pre-bankruptcy" planning. More specifically, filers who wish to retain a high valued asset with substantial net worth (over and above what exemptions allow) may strategically encumber the asset with secured debt to reduce its net value. Since the encumbrances are captured in the reporting process, the net value of the exempt asset falls, and the asset may be exempted. While this may or may not be appropriate, it does ensure that the data collected in this study are more likely to capture all available information in the filing process, and by extension that Hackney, Friesner, and McPherson's (2018) assumption is reasonable.
3. As of April 2020, data are also available for the 2018 calendar year. Only a small number of 2018 cases from the State of Oregon (338) were reported in the dataset. The data were last updated on July 5, 2019, and the dataset does not appear to be formatted as formally as the data available for previous years. Based on these considerations, it was unclear as to whether the 2018 cases represent an entire calendar year, or a part of the year. As a result, data from 2018 were not included in this study.

REFERENCES

Athreya, K. (2006). Fresh start or head start? Uniform bankruptcy exemptions and welfare. *Journal of Economic Dynamics and Control, 30*, 2051–2079.

Anderson, D., Sweeney, D., & Williams, T. (2000). *An introduction to management science: Quantitative approaches to decision making* (9th edition). Cincinnati, OH: South-Western Publishing.

Fay, S., Hurst, E., & White, M. (2002). The household bankruptcy decision. *American Economic Review, 92*(3), 706-718.

Grochulski, B. (2010). Optimal personal bankruptcy design under moral hazard. *Review of Economic Dynamics, 13*, 350-378.

Hackney, D., & Friesner, D. (2015). Using misclassification analysis to evaluate the effectiveness of the BAPCPA means test. *Journal of Accounting and Finance, 15*(4), 40-52.

Hackney, D., Friesner, D., & Johnson, E. (2016). What is the actual prevalence of medical bankruptcies? *International Journal of Social Economics, 43*(12), 1284-1299.

Hackney, D., McPherson, M., & Friesner, D. (2018). Do federal bankruptcy exemptions fundamentally alter Chapter 7 bankruptcy outcomes? *Journal of Accounting and Finance, 18*(6), 105-127.

Jiminez, D. (2009). The distribution of assets in consumer Chapter 7 bankruptcy cases. *American Bankruptcy Law Journal, 83*(4), 795-822.

Lefgren, L., & McIntyre, F. (2010). Explaining the puzzle of cross-state differences in bankruptcy rates. *Journal of Law and Economics, 52*(2), 367-393.

Loibl, C., Hira, T., & Rupured, M. (2006). First time versus repeat filers: The likelihood of completing a Chapter 13 bankruptcy repayment plan. *Journal of Financial Counseling & Planning, 17*(1), 23-33.

Norberg, S., & Compo, N. (2007). Report on an empirical study of district variations, and the role of judges, trustees and debtors' attorneys in Chapter 13 bankruptcy cases. *American Bankruptcy Law Journal, 81*(4), 431-470.

Ozcan, Y. (2009). *Quantitative methods in health care management: Techniques and applications* (2nd edition). San Francisco, CA: John Wiley & Sons.

Power, B. (2007). The courts, Congress and tax debts: An analysis of the discharge of tax debts before and after the enactment of the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005. *Fordham Journal of Corporate & Financial Law, 12*, 881-911. Retrieved April 15, 2020, from https://ir.lawnet.fordham.edu/jcfl/vol12/iss5/3/

Sullivan, T.A., Warren, E., & Westbrook, J.L. (1988). Laws, models, and real people: Choice of chapter in personal bankruptcy. *Law & Social Inquiry, 13*(4), 661-706.

Sullivan, T.A., Warren, E., & Westbrook, J.L. (1997). Consumer bankruptcy in the United States: A study of alleged abuse and of local legal culture. *Journal of Consumer Policy, 20*(2), 223-268.

United States Supreme Court. (1991). Coy R. Grogan, et al. v. Frank J. Garner, Jr. Retrieved May 5,2020, from https://www.law.cornell.edu/supremecourt/text/498/279

Zhu, N. (2011). Household consumption and personal bankruptcy. *Journal of Legal Studies, 40*(1), 1-37.