RESEARCH ARTICLE

WILEY
INSOL International

Predicting repeat consumer bankruptcy: A survival analysis of business-related repeat filings in Australia 2007–2021

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Abstract

Ongoing legislative responses to the impacts of the pandemic have prompted many countries to evaluate whether their bankruptcy systems remain fit for purpose. Moreover, the current climate highlights the importance of data-driven policy, which the literature identifies as a deficiency of bankruptcy regimes. In Australia, the 2015 reform proposals to reduce the default discharge period from 3 years to 1 year are currently being revised amidst stakeholder concern about potential abuse and repeat bankrupts. Although an extensive body of literature exists on 'repeat filers' in the USA, there has been no equivalent study in Australia. Using our data of 153,526 bankruptcies between 2007 and 2021, we conducted a novel application of survival analysis to predict the probability of a repeat bankruptcy comparing business and non-business groups. The results show that this probability peaked in both male and females with non-business-related administrations irrespective of client's age, employment and relationship status. These findings are important as they identify the prospects that certain bankrupt groups have higher rates of repeat bankruptcy, which can inform strategies to improve their survival rate. A significance of our study is the development of a high-quality longitudinal dataset

> that facilitates the extension of the data models and allows easy updates about targeted questions involving bankruptcy-related policy shifts and impacts on sub-populations. This methodological approach will enable regulators and insolvency experts to address concerns of repeat bankruptcy to guide policy, evaluate reform and extend the evidence base in other jurisdictions.

1 | INTRODUCTION

The increasing significance of personal insolvency law has seen a 'global proliferation' of reforms over the past three decades.[1] The COVID-19 pandemic has been the catalyst for many nations to implement swift ad hoc insolvency legislation to mitigate the ongoing economic and social consequences.[2] While for some countries, these were temporary measures, others harnessed the opportunity to expedite reforms that were already existing in the political agenda or holistically examine whether their insolvency and rescue systems remain fit for purpose.[3] In Australia, the 2023 Parliamentary Joint Committee on Corporations and Financial Services recommended that harmonisation and simplification of the separately codified corporate and personal insolvency regimes to be 'worthy, high-level guiding reform objectives'.[4] Relevant to this article, in personal insolvency, the Government's response included consideration of reviving changes to the *Bankruptcy Act 1966* (Cth) to reduce the three-year default bankruptcy period to 1 year.[5] At the time of submission of this article, the Attorney-General's Department advised that an option for a shorter discharge period from bankruptcy for some bankrupts will require further analysis and considered in consultation with stakeholders at a later stage.[6]

The effect of these legislative measures over the past few years has contributed to historic low rates of personal bankruptcies globally.[7] The Australian experience is consistent with this trend. There has been a general decline in bankruptcy volumes over the 10-year period (2012–2013 to 2021–2022). During this period, an average of 15,207 bankruptcies were recorded per financial year.[8] In the 2021–2022 financial year, there were 5,986 bankruptcies, a 11.9% fall compared to 2020–2021. While bankruptcy volumes are low, the proportion of business-related bankruptcies has remained steady at 34.2% in 2021–2022, which is below the 10-year average for the period 2012–2013 to 2021–2022 of 39.1%.[9] Furthermore, due to a subdued growth in economic activity in Australia, it is anticipated there will be a reversion towards pre-pandemic levels over the next 2 years, whereby shifts in macroeconomic dynamics will propagate to the individual level (including household financial distress).[10]

The considerations of bankruptcy as a progressive institution versus a legitimating and disciplinary institution have been extensively documented elsewhere.[11] Bankruptcy allows distressed debtors to discharge unmanageable debts while providing for the realisation of a debtor's available assets for distribution to affected creditors.[12] In Australia, voluntary bankruptcy commences with debtors filing an application directly to the personal insolvency regulator, the Australian Financial Security Authority ('AFSA').[13] Like in the USA, where the 'fresh start' purpose is said to have originated and many other countries, bankruptcy in Australia also has the same protective function described as

'to relieve the honest debtor from the weight of oppressive indebtedness and permit [them] to start afresh free from the obligations and responsibilities consequent upon business misfortunes... a new opportunity in life and a clear field for future effort, unhampered by the pressure and discouragement of pre-existing debt'.[14]

The literature recognises the availability of bankruptcy as important to the economy.[15] Moreover, Ali et al. report that it can play a key role in improving overall well-being:

'for many Australian debtors, bankruptcy results in genuine improvements to financial stability, health, relationships and general well-being'.[16]

While the intent is to provide a fresh start without the need to resort to bankruptcy again, scholars have identified that debtors continue to experience financial trouble after discharge and even suggest that debtors continue to suffer financially for a significant period after bankruptcy.[17] Yet despite its importance, there remains limited longitudinal research, which follows debtors in the years after filing.[18] There are, however, comprehensive works on the perceived 'problem' of repeat filers (e.g., Sullivan et al. 1989; Lown and Rowe 1990; Strand et al. 1994; Golmant and Ulhrich 2006) and Congress' subsequent reforms to the US Bankruptcy Code terminating the automatic stay for serial-filing debtors.[19] A common element found in the literature on repeat filers is the need for exploration of factors such as age and gender to build a profile of debtors and give a 'better picture to understand the problem'. Underpinning this and more generally in the literature on *failed* consumer bankruptcy law reforms is a serious need for data-driven policy supported by more anecdotal evidence.[20] This requirement is critical amidst the current and ongoing global insolvency reform and particularly where legislation is enacted without the proper scrutiny. It is in this context that the lead author was commissioned by AFSA to collaborate with the agency on this research.

In this article, we aim to contribute to and bridge multiple strands of repeat bankruptcy scholarship. First and foremost, we advance the empirical literature by evaluating the time to repeat consumer bankruptcy between business and non-business groups. We achieve this by employing novel measures to quantify this phenomenon. The initial phase used probabilistic matching methods to establish a unique dataset to identify individuals with two or more bankruptcies from the AFSA administrative data file. This was an essential step as unlike in the USA, Australia does not have a social security number or common identifier system for its citizens, which might otherwise easily determine repetitive occurrence. A novel application of mixed-effects parametric survival modelling was used to investigate data across the 14-year follow-up period between 2007 and 2021 with an eight-year look-back for previous bankruptcies. The cohort timeframes align with AFSA being formed as an executive agency established under the *Public Service Act 1999* (i.e., eight-year look-back 1999–2007) and the establishment of a comprehensive dataset in 2007. While the use of survival analysis in corporate insolvency is well documented, it has never been applied to personal bankruptcy.[21]

A second novel aspect of this study is that by incorporating variables such as age, gender and employment status, our results give an interesting picture of survival in repeat bankruptcy and high-risk groups. According to our analysis, the probability of a repeat bankruptcy peaked in both males and females with non-business-related administrations irrespective of age, employment and relationship status. Specifically, the probability was higher in female non-business-related bankrupts compared to female business-related bankrupts and compared to

male business- and non-business-related bankrupts. From the results, we identify opportunities to evaluate targeted questions for future research.

Finally, we weigh in on the discourse about a lack of empirical data in insolvency law analysis. Criticism of insolvency legislation is that regimes are designed or assessed without data showing the performance of the system or issues experienced in its application.[22] Sullivan et al. explain this as

> 'the most significant thing about the role of empirical research in bankruptcy policy has been its insignificance'.[23]

We respond to this call through scholarly publication of AFSA's statistical innovation. AFSA is the central statistical authority of personal insolvency and collects comprehensive information about bankruptcy proceedings. This study represents an important step in the development of a high-quality longitudinal data system to facilitate the extension of data models. AFSA's primary objective is to use the results in conjunction with stakeholders to assess policy and inform design, which can give confidence to Australia's insolvency regime. Dissemination of our methodological approach aspires to help other insolvency regulators and experts generate new knowledge and evidence about repeat bankruptcy to shape policy and continue this important discussion. Our study is also significant in its broader acknowledgment that effective regulation involves collaboration between critical insolvency stakeholders.

This article is structured as follows. The next section provides a background to our study and consists of two parts. First, we present the main features and objectives underpinning the one-year bankruptcy reform in Australia. Following this, we provide an overview of the repeat bankruptcy scholarship with a focus on three areas: rates of repeat bankruptcy, profile of debtors and statistical methodology. We conclude each part by explaining how our research responds to the literature. Sections 3 and 4 detail our research methodology, and Section 5 outlines the inherent limitations of the data. To conclude, we discuss the findings and implications for repeat bankruptcy scholarship, policy and reform.

2 | BACKGROUND

2.1 | Return of the one-year bankruptcy reform

In Australia, the length of the discharge period has been debated since 1980.[24] The following is designed to give an overview of the current legislative reform. For a more detailed discussion of the protracted history surrounding amendments to an early discharge period, readers are directed to more specialist publications.[25] Reforms to the current default period of bankruptcy were first announced by the Government in 2015. In October 2017, the *Bankruptcy Amendment (Enterprise Incentives) Bill 2017* (Cth) ('*Enterprise Incentives Bill*') was introduced to amend the *Bankruptcy Act 1966* (Cth) to reduce the discharge period from 3 years to 1 year (subject to exclusions).[26]

The aim of the *Enterprise Incentives Bill* was to foster entrepreneurial behaviour and reduce the stigma associated with bankruptcy while maintaining the integrity of the regulatory and enforcement frameworks for the personal insolvency regime.[27] Although the *Enterprise Incentives Bill* lapsed in 2019, it was revived in 2021 as part of the Government's ongoing response to address the impacts of the pandemic.[28] The liberalisation of the discharge process and policy

reasoning underpinning the reform reflects what Ramsay describes as the 'second wave' of personal insolvency law research, that is the extent to which personal insolvency law achieves objectives associated with the fresh start such as increased entrepreneurialism and financial and social inclusion.[29] This is distinct from the 'first wave', such as the US experience, where the impetus for reform was driven by concern of whether individuals were abusing the system.[30] This distinction is important as a policy objective as it establishes the framework to support the instruments that can be used to attain these goals.

Opponents of the proposed reforms argue that, inter alia, the reduction undermines individual motivation to take reasonable steps to minimise the prospect of bankruptcy and increases the potential for exploitation of the system by '*rogue, reckless and repeat bankrupts*'.[31] In an effort to resolve stakeholder concerns, in its second iteration, the Government proposed exclusions designed to prevent multiple filings by those seeking to use the system too frequently to discharge debts. Specifically, those who have been bankrupt in the previous years are precluded from an order of absolute discharge after 1 year. The reforms propose that second-time bankrupts must wait 2 years and third-time bankrupts must wait 3 years before being entitled to an automatic discharge.[32] The policy reasoning considers the fact that multiple bankruptcies can occur due to circumstances beyond the control of the bankrupt.[33]

Until now, there have been no longitudinal cohort studies of repeat bankruptcies in Australia. Previous cross-sectional studies have included characteristics of personal and business debtors, geography of bankrupts, women and the elderly in the system, stakeholder attitudes and factors leading to consumer bankruptcy.[34] Our study builds on this evidence base with focus on the explicit modelling of the shape of trajectories of individual consumers over time and how these trajectories vary, systematically, because of consumer-level covariates (e.g., cause of bankruptcy).[35] Thus, whether there *is* a problem with repeat bankrupts has not yet been the subject of empirical investigation. That stakeholder discourse around early discharge continues to be a topic of debate (some views of which have remained unchanged in the years between reform proposals) highlights the need for evidence regarding the incidences and profiles of repeat debtors in Australia and, if implemented, to measure the impact of the reforms on repeat bankruptcy.[36]

2.2 | Repeat bankruptcy scholarship

Bankruptcy literature is reported across many jurisdictions and disciplines including economics, business, law, finance, consumer, and medicine.[37] However, repeat bankruptcy studies remain largely confined to US scholars. The following literature review identifies possible reasons for this, the most significant challenges being the time and resources required to create a single national dataset and the complex statistical modelling required to analyse them due to variables such as bankruptcies being 'nested' within each other (i.e., being made bankrupt a second time where the debtor has not been discharged from the first bankruptcy) as well as separating business and non-business filings.

We have positioned our research within three distinct areas of scholarship. The first section will discuss the literature on rates of repeat filings before and after the introduction of the US *Bankruptcy Abuse Prevention and Consumer Protection Act of 2005* ('BAPCA'), the reform to counteract a growing trend of bankruptcy filings by unscrupulous debtors.[38] We outline how our work addresses limitations arising from the previous studies, which will assist with evaluation of the imminent Australian bankruptcy reforms. Section 2 will examine the

profile of repeat filers from an international perspective and then detail the demographics we investigated in our study. The final section will provide the background of statistical methodology literature from which we derived our methodological approach.

2.2.1 | Rates of filings

There is numerous empirical literature that examines the rates of repeat bankruptcy filings under the US Bankruptcy Code.[39] The majority of consumer bankruptcy cases in the US are either Chapter Seven or Chapter 13.[40] In sum, Chapter Seven are 'liquidations' where the debtor's available assets are typically liquidated or sold to satisfy debts, whereas Chapter 13, known as the 'wage earner's plan', involves a court approved restructuring of debts of an individual with regular income.[41] Sullivan, Warren and Westbrook's (1989) landmark work, *As We Forgive our Debtors*, examined 1,500 households in the bankruptcy system across five different states, finding that 8% of debtors had filed for bankruptcy more than once.[42] Llewellyn (2005) and Pace (2013) noted that these figures were not precise as the bankruptcy documents were incomplete and the timeframe for Chapter 13 repayment plans resulted in cases that were still pending.[43] Lown and Rowe's (1990) similar examination of 2,567 cases filed in Manitoba (Canada) and Iowa (US) found that 14% of filers were repeat filers.[44] In more detail, a 2005 study by the same authors examined differences between those who choose Chapter Seven and Chapter 13 in Utah. The authors found that about 8% of Chapter Seven filers and 27% of Chapter Thirteen were repeat filers.[45] Along this line, Llewellyn and Lown (2005) investigated repeat bankruptcies of 2,194 cases in Utah, finding evidence of likely abuse of the bankruptcy system for 10.7% of the households.[46] This was an increase from Sullivan's findings.[47]

A limitation of the earlier studies was that they focussed on one, or a few judicial districts and so were confined to a local data point of the percentage of repeat filers.[48] Golmant and Ulhrich's (2006) work addressed this gap by examining, 'What is the national repeat filing rate and how does it vary by district?' The authors found that 16% of filings *nationwide* were repeat filings and 8% of consumer debtors were repeat filers.[49]

The literature suggests that despite empirical data evidencing low rates of repeat bankruptcy, it had been the subject of ongoing debate in the US Congress since 1898.[50] The situation came to a head when Congress passed the BAPCA in an attempt to prevent what it perceived as a 'deep problem of abusive and repeat' bankruptcy filings.[51] In separate, early studies of the BAPCA, Bartell and Greene concluded that even after the implementation of legislation to prevent bankruptcy abuse, there was still a significant number of repeat filers.[52] Greene's study of Chapter 13 filers from the 2007 Consumer Bankruptcy Project national sample found that one in seven bankruptcy cases were repeat filers.[53] Greene concluded that the BAPCA had been drafted without the relevant data to support the amendments and insufficient consultation with stakeholders. Recounting the experience of bankruptcy judges, the author observed that the statute was impractical and increased administrative work, time and money.[54]

Porter's (2015) critique of Bartell and Greene's studies was that they could not support the conclusion that the BAPCA reform failed to deter repeat filings as the authors did not 'measure the refiling rate over time using BAPCA as an intervention'.[55] Responding to this, Pace's (2013) study was the first evaluation of the impact of the reform from a dataset of 335,738 bankruptcy filers in Utah between 1984 and 2012.[56] Pace found that in the first 2 years of the reform, the likelihood of bankruptcy filers having a previous filing bankruptcy in either the past 8 years or the past 20 years was *reduced* with BAPCA for Chapter Seven and Chapter 13 cases.[57] However,

the likelihood of future bankruptcy within 5 years after BAPCA *increased* significantly for both Chapter Seven and Chapter 13 from 10% to 22% overall.[58] While the studies conflict, the dominant view that emerged was there was no evidence of substantial abuse of repeat filings in the USA.

Our study extends the literature by providing the first account of this decade of a nationwide large sample involving 153,526 bankruptcy filings across a 14-year time frame with an eight-year look-back for previous bankruptcies. This addresses concerns with jurisdictional limitations as debtors can only file with AFSA and the long observation window allows for more reliable data collection.[59] Our findings also corroborate the conjecture 'a third discharge merely prepares the way for a fourth bankruptcy' as the results show the risk of repeat bankruptcy significantly increased with accumulated numbers of previous administrations.[60] We overcome issues with inconsistency, which the literature identifies as arising from analysing different datasets, as our longitudinal dataset is the first of its kind in Australia for purposes of researching repeat bankruptcy. In addition, like Pace's (2013) research, we aim to use the dataset to evaluate any impact of the reforms to reduce the discharge period to 1 year. In the short term, we have the capability to identify early signs of filing abuse and in the medium and longer terms, we will also be able to target information such as vulnerable sub-populations. This surveillance will be vital to informing legislative and policy interventions.

2.2.2 | Profile of repeat filers

The international experience

In addition to identifying the frequency of repeat bankruptcy filings, it is of crucial importance to build an evidence-based profile and financial picture of debtors. This is to understand the life course risk factors for bankruptcy and identify sub-groups of the population who are at risk of repeat bankruptcy. As discussed above, despite arguments by the American government and industry that repeat filers *are* a problem, there has been little empirical work to *quantify* the problem.[61] Telfer (2014) acknowledging that repeat bankruptcy study has also received little attention in Canada notes there is an argument for two types of repeat bankrupts: 'behavioural and structural repeat filers'. A behavioural debtor will 'over-value current consumption and underestimate future costs' and simply 'cannot stop spending beyond their means'. On the other hand, a structural repeat filing results from 'external factors such as job loss, medical problems and divorce' who use bankruptcy to 'smooth consumption during economic distress' which has been caused by one of the external factors. Despite the social and economic implications of substantiating these claims, there have been only three empirical studies from the USA and Canada that provide insight into the demographics of repeat bankrupts.

This field started with Strand et al. (1994), who compared repeat filers to one-time petitioners.[62] From a sample size of 150 respondents from randomly selected bankruptcy records and a survey of debtors from Manitoba and Iowa, the authors found that repeat filers were older, had lower monthly expenses, mean value of total assets, mean monthly incomes and lower mean value of unsecured and secured debt levels compared to one-time petitions.[63] Llewellyn's (2005) study utilised a larger sample size to examine the incidence of repeat filers in Utah between 1984 and 2004 and the extent to which they may be abusing the bankruptcy system. The cited author examined both financial and demographic variables. Demographic variables included filing status, marital status and household size.[64] Abusers appeared to have been married and to have larger household sizes.[65] Unsecured debt and monthly income were the

only two financial variables in estimating debtor abuse.[66] Financial circumstances included abusers having higher secured debt but lower unsecured debt and reported higher monthly incomes. Debtors with income above the median for the sample were almost twice as likely to be abusers.[67] Overall, Llewellyn concluded that, consistent with the literature, abuse of consumer bankruptcy by repeat filers was *not* extensive.[68]

Like the early studies on rates of repeat bankruptcies, geography is a limitation of Pace (2013) and Llewellyn's research as petitioners may have filed in other districts. Another limitation is the lack of demographic data. Pace described the problem as being

> 'limited to only court required information directly pertaining to debts. For example, filers are not required to report their level of education, marital history, medical coverage, or age on the forms'.[69]

In Pace's study, only 63 of 235 (27%) of petitioners indicated their age from which the author extrapolated the mean age of 35.2 years (range 21–56 years, respectively).[70] Pace found that relative to those filing for the first time in 8 years, repeat bankruptcy filers were more likely to have children, mortgages and medical debt. However, these findings were merely incidental as the author did not incorporate these factors into the dataset. The author notes the absence of key data relating to gender, race, age and educational status of bankruptcy filers as a limitation of their study.[71] This led Pace to put a greater emphasis on the importance of examining occupation, marital and employment history for future research.[72]

Lastly, in all US studies, the employment, family, sociodemographic and financial variables were obtained directly from the bankruptcy court records for the relevant filing year with 'varying degrees of detail'.[73] Llewellyn pointed out this required, 'comb[ing] up to 30 pages of paperwork to find information on characteristics of debtors'.[74] Similarly, Pace's study involved consolidating data from multiple sources.[75] The US experience highlights the difficulty with obtaining and sorting extensive data of multiple bankrupts and bankruptcy datasets across different jurisdictions. It also calls attention to the significant resources and interdisciplinary expertise required to analyse the data. It is arguable these barriers have impeded the advancement of consumer repeat bankruptcy research.

The Australian focus

In the development of a model to predict consumer repeat bankruptcy, we attempt to address several of these issues. As noted above, as the regulator and primary source of personal insolvency statistics, AFSA is continually collecting data and has created a unique dataset. Unlike previous studies, we specifically analyse the effects of certain variables such as dates of bankruptcy, age, gender, relationship status and business or non-business on repeat bankruptcy. We relied on the relevant literature to select these variables, for example gender studies that show that men and women differ in decision-making and priorities relating to finance and business.[76]

Our study gives primacy to investigating the effects of gender and non-business and business on repeat bankruptcy and contributing to the literature in these areas. The effect of business is a key focus of our study, as noted in Section 1, the proportion of business-related bankruptcies in Australia was 34.2% in the financial year 2021–2022. By comparison, pre-pandemic levels of business-related bankruptcies constituted 38.1% of total bankruptcies in the financial year 2018–2019. Cepec and Grajzl (2021) note the dynamics and failure of small businesses has long been a subject of vital interest to policymakers and scholars.[77] In Australia, this focus is reinforced by the current Parliamentary review into our corporate insolvency structures arising from the

'uptick of insolvencies as pandemic-era protections wane and businesses battle inflation and supply-chain issues'.[78]

Most notably, small businesses comprise 2,506,012 million (97.5%) of the 2,569,900 million businesses in Australia.[79]

Our second point of investigation arises from the fact that women are becoming increasingly significant in small business.[80] Topic et al. (2021) conducted a systematic literature review of women in SMEs from 2000 to 2021 finding, inter alia, that there is a lack of feminist scholarship on women and SMEs.[81] Yet, at the same time, there is growing scholarly interest in the position of women in SMEs, which correlates with government interest in SMEs and their importance to economies.[82] While an extensive literature review of gender and business is beyond the scope of this article, a common thread in the literature is the need to better understand the profile of women and sub-groups in business.[83] While the studies Topic et al. examined were not conducted in Australia, there is commonality with other jurisdictions in that there is a clear upward trend of women in business.[84] In Australia, over the past 20 years there has been a 46% increase in women business owners to just under 35%.[85] While this growth has not been rapid, the increasing number and the current economic climate require a more detailed examination of the challenges facing small business and how sex and gender interact to determine small business outcomes, specifically, business-related repeat bankruptcy. To date, gender analysis in this area remains limited.[86] Therefore, in the application of mixed-effects survival analysis to investigate patterns of recurring business-related bankruptcies, we report findings for males and females separately.

2.2.3 | Statistical modelling of repeat bankruptcy

Statistical modelling of bankruptcy has a long history with a common goal, to enhance the decision support tools and improve decision-making.[87] There is a wealth of literature on the use of different statistical models for assessing the risk of business failure, including survival analysis (time until an event occurs), which is a novel aspect of our methodology.[88] Even then survival models have been used in only a few studies.[89] Most recently, Cepec and Grajzl's (2021) study has applied survival analysis to management turnover and ownership changes as determinants of post-bankruptcy failure of small businesses.[90] Relevant to our study, Dinterman and Katchova's (2021) research applied survival analysis to evaluate the time to completion of Chapter Twelve bankruptcy cases for farmers.[91] Reduced completion time was a key objective of the BAPCA as both debtors and creditors prefer to have a shorter time to completion to reduce costs associated with bankruptcy.[92] Using survival analysis, the authors examined completion times of Chapter Twelve cases to derive a better understanding of which farmer characteristics affect the time to completion.[93]

On the other hand, there have been few statistical methods used in consumer repeat bankruptcy. Bankrupts are a difficult group to study, and longitudinal data require following individuals over a reasonable period.[94] Datasets consisting of multiple bankrupt records per individual present more complex challenges due to correlation within individuals. Previous repeat bankruptcy studies have used a traditional regression model to estimate the effect of key independent variables. This method can be a valid starting point; however, traditional regression models assume that individuals are independent of one another, ignoring the correlation *within* subjects. As a result, this can generate distorted estimates of recurrent events.[95] For example, a

common *intra-cluster correlation* in the context of bankruptcy events amongst clients is that it would be reasonable to expect that risk of bankruptcy will increase with the accumulated number of previous bankruptcies.

The past two decades have seen mixed-effects models becoming a part of the statistical mainstream.[96] Our study applies mixed-effects parametric survival modelling to investigate the rich but complex data of multiple bankrupt records per individual across a follow-up period. The advantage of this technique compared to traditional approaches, such as logistic regression, is that individuals' bankruptcy events after the first are incorporated. Mixed-effects survival models contain both fixed effects and random effects. Additionally, in longitudinal data, random effects are useful for modelling intra-cluster correlations such as increase in repeat bankruptcy. In the following section, we outline our research methods.

3 | METHOD

3.1 | Data collection and management procedure

The quantitative data in this study were obtained from a large dataset provided by AFSA in 2021. Data were supplied for the records of 153,526 voluntary business and non-business-related consecutive bankruptcies initiated between 1 July 2007 and 3 September 2021. In this descriptive study, compulsory court-ordered bankruptcies were excluded to eliminate confounding factors, which may constitute an entirely different sub-population with different characteristics and which might otherwise distort the findings. This study was narrowed to a specific set of variables and sub-population (voluntary bankruptcies) rather than a mixed population including compulsory bankruptcies. The limitation of this methodology is discussed further below. The dataset provided each bankruptcy event with an administration number, person's name, gender, age, business or non-business, relationship status and date of bankruptcy. To investigate multiple bankrupt records per individual across 14-year follow-up period, we regarded bankrupts as the outcome events. Accordingly, by the end of follow-up, a consumer would have experienced one of the following:

- No repeat bankruptcy.
- One repeat bankruptcy.
- Two or more bankruptcies.

We note that later debts can lead to later bankruptcy. This means that an individual can be made bankrupt a second time even if they have not been discharged from their first bankruptcy.

To establish a cohort dataset, we used the method of probabilistic linking to assign unique individual identifiers to analyse repeat bankruptcy at the individual level. Probabilistic linkage methods score each potential set of records on the probability that two or more records match, so that sets with higher overall scores indicate a better match than sets with lower scores. The data linking software package in Stata 17, *dtalink* was used.

The matching process comprised multiple steps, which were informed by decision rules about which cases might qualify as matches, how much weight should be given to each matching variable and an overall cut-off score for individuals to be considered matches. Table 1 shows the final weights used in the current analysis. These were derived from an iterative process where the initial values were from previous literature.

TABLE 1 Overview of duplicate check criteria.

	Measure	Match weight	Non-match weight
Blocking variable	Gender of individual in case	–	–
Matching variables	First name	7.3	−3.9
	Last name	10.7	−2.3
	Date of birth	13.9	−2.6
	State or territory	2	−4.1

Source: AFSA data.

Sensitivity analyses were conducted to determine how different values of the cut-off score for determining the minimum score required to keep matched records impacted on survival model estimates (see Results section).

3.2 | Measurement

3.2.1 | Time to event variable

To investigate multiple bankrupt records per individual across the 14-year follow-up period, we regarded repeat bankruptcy as the outcome event. Accordingly, by the end of study follow-up, an individual would have experienced one of the following: no repeat bankruptcy, one repeat bankruptcy, and two or more repeat bankruptcies. Each outcome event was specified as an indicator variable for which individuals had the event outcome = 1 or were censored outcome = 0. In this study, all censored outcomes were right-censored due to individuals not having experienced a repeat bankruptcy by the study end date. Censoring occurs when the event (i.e., repeat bankruptcy) is not observed for some clients before the study is terminated. However, the client may come at risk for a repeat bankruptcy after the study completion date. Therefore, in our analysis, we assume that this type of censoring occurs randomly. In other words, we assumed that this censoring was non-informative censoring and therefore unrelated to the likelihood of a repeat bankruptcy. The time of risk of onset was first bankruptcy discharge date. The analysis time (in years) started at zero at the onset of risk and was under observation until a repeat bankruptcy occurred or study end date.

3.2.2 | Independent variables

The personal bankruptcy cohort was disaggregated into business and non-business-related bankruptcies as the primary study variable of interest. A business-related bankruptcy occurs when the individual declares to have operated as a sole trader, in a business partnership or was a director/secretary of a company in the last 5 years. This variable was an indicator variable, with a value of 1 indicating business-related bankruptcy. This variable was time varying because an individual may have experienced either a business or non-business-related bankruptcy or both. For example, a client's business status could move from business to non-business (or vice versa) from one bankruptcy to another.

3.2.3 | Control variables

Time-varying covariates were age, relationship status, employment status and region. The binary variable for prior bankruptcy between 1999 and 2004 was constant within individuals.

3.2.4 | Statistical analysis

Corresponding with the study aim, the analysis sought to investigate the relationship between business (versus non-business) bankruptcy and the time to occurrence of a repeat bankruptcy. The study of events involving an element of time can be sufficiently examined by adopting survival analysis. Survival analysis is a collection of statistical procedures for data analysis for which the outcome variable of interest is time until an event occurs. Time can mean years, months, weeks or days from the beginning of follow-up of an individual until an event occurs. An event can be any specified experience of interest that may happen to an individual, for example disease incidence, recovery (e.g., return to work) or farm bankruptcy filings. When more than one event is considered such as for repeat bankruptcy, the statistical problem can be characterised as a recurrent event.

- To investigate the case of our data comprised of recurrent bankrupt records per individual across 14-year follow-up period, we used mixed-effects parametric survival modelling. Mixed-effects survival models contain both fixed effects and random effects. Fixed effects, called regression coefficients or fixed-effect parameters, describe the relationship between the dependent variable (i.e., repeat bankruptcy) and predictor variables (i.e., business versus non-business-related bankruptcy) for the entire population of client records in the analysis. Random effects correspond to the client-specific random deviation from the overall population response. The advantage of this technique compared to traditional approaches such as both logistic regression and time to first event Cox modelling is that individuals' failure events after the first are incorporated. Additionally, random effects are useful for modelling intra-individual correlation; that is, the dependence amongst observations in the same individual is explicitly modelled.

- To model these random effects, we used a Weibull parametric model where the change in hazard function—the intensity with which repeat bankruptcy occurred—was assumed to (monotonically) increase over time. This is commensurate with the theoretical notion observed by Telfer (2014) as noted above that a second bankruptcy leads to a third or subsequent bankruptcies. This type of model has particular advantages including that coefficients or estimators can be meaningful in terms of insolvency in the 'real-world' and fitted values from the model can provide estimates of survival time. The Weibull model is widely used in survival analysis due to its flexibility in modelling time to event data. To interpret model estimates, we report hazard ratios and associated confidence intervals, which are the relative risks associated with a business-related bankruptcy during the study period. These hazard ratios are interpreted as 'conditional hazard ratios', that is, conditional on the individual-level effects. Statistical threshold for significance was 0.05. We also report estimates from several alternatively specified survival analysis models in order to appraise the robustness of our model. These models were marginal or population-averaged models to estimate the parameters as if the data were single level or non-clustered and accounted for clustering when estimating the standard errors. These semi-parametric models make fewer assumptions on the form of the hazard function and provide a useful reference for our parametric model.

4 | RESULTS

4.1 | Descriptive statistics

In the study period, there were a total of 153,526 bankruptcies for $N = 145,816$ consumers. Table 2 provides consumer demographics and business-related data. The cohort was comprised of more men than women with mean age of 43 years (interquartile range: 34–52 years). Approximately 58% of males reported being employed and 50% females at commencement of follow-up period. More males reported a business-related bankruptcy (23%) compared to females (14%). Approximately 4% of individual males and females had experienced a bankruptcy between 1999 and 2007.

Table 3 shows bankruptcy counts in terms of individual consumers having a prior bankruptcy between 1999 and 2007. Almost 4% of cohort who did not experience a repeat bankruptcy in cohort period had at least one bankruptcy prior to 2007.

4.2 | Survival analysis

The application of mixed-effects survival analysis was used to model the multiple bankruptcies to account for the underlying risk for individuals to vary across 14-year follow-up period. Independent variables in the survival model were business-related bankruptcy ('exposure' variable), and this was covariate adjusted for age, relationship status, employment status and previous bankruptcy between years 1999 and 2007.

TABLE 2 Baseline characteristics of individual bankrupts.

N (%)	Males (n = 81,445)	Females (n = 64,371)	Total (N = 145,816)
Baseline age (years), mean (SD)	43.9 (13)	43.2 (12.9)	43.6 (13)
Employed			
Yes	47,396 (58.2)	32,092 (49.9)	79,488 (54.5)
No	33,908 (41.6)	32,181 (50)	66,089 (45.3)
Missing	141 (0.2)	98 (0.2)	239 (0.2)
Business-related			
Yes	19,056 (23.4)	8,716 (13.5)	27,772 (19.1)
No	62,357 (76.6)	55,632 (86.4)	117,989 (80.9)
Missing	32 (0.04)	23 (0.04)	55 (0.04)
1999–2007 bankruptcy			
Yes	3,223 (4)	3,002 (4.7)	6,225 (4.3)
No	78,222 (96)	61, 369 (95.3)	139,591 (95.7)
Spouse			
Yes	39,195 (48.1)	25,731 (40)	64,926 (44.5)
No	42,241 (51.9)	38,638 (60)	80,879 (55.5)
Missing	9 (0.01)	2 (0)	11 (0.01)

Source: AFSA data.

TABLE 3 Number of bankrupts for cohort entry period between July 2007 and December 2013, in terms of having a bankruptcy between January 1999 and June 2007.

Repeat bankrupts	Number of bankrupts	Number not having bankruptcy before 2007	Number having bankruptcy before 2007	Percentage not having bankruptcy before 2007	Percentage having bankruptcy before 2007
0	138,642	133,329	5,313	96.2	3.8
1	6,753	5,953	800	88.1	11.9
2	367	283	84	77.1	22.9
3	43	23	20	53.5	46.5
4	11	3	8	27.3	72.7

Source: AFSA data.

TABLE 4 Survival model estimates: primary analysis.

	Males			Females		
	Hazard ratio	95% confidence interval	*p*-value	Hazard ratio	95% confidence interval	*p*-value
Fixed-effects						
Business	0.87	0.81–0.92	0.001	0.59	0.51–0.68	<0.001
Prior	3.70	3.34–4.11	<0.001	5.05	4.50–5.67	<0.001
Age	0.98	0.97–0.98	<0.001	0.97	0.97–0.97	<0.001
Spouse	0.99	0.93–1.06	0.870	0.83	0.76–0.90	<0.001
Unemployed	0.86	0.81–0.92	<0.001	1.0	0.93–1.09	0.868
Random intercept						
Variance	1.0	0.85–1.16		1.54	1.35–1.76	

Source: AFSA data.

For 81,455 male consumers, the average number of bankruptcies per individual was 1.0 (range, 1–5) and a total of 85,118 events across the 14-year follow-up period. For 64,371 female consumers, the average number of bankruptcies per individual was also 1.0 (range, 1–5) and a total of 67,002 events across follow-up period.

Survival analysis results are shown in Table 4. The hazard ratios are exponentiated coefficients and are interpreted as conditional hazard ratios; that is, the dependence amongst repeat bankruptcies within an individual is explicitly modelled using random effects. The hazard ratio for business-related males is 0.87. This means that according to the model, for a given male consumer, the risk of a repeat bankruptcy would be 13% lower $[-13\% = 100\% \, (0.87-1)]$ than a male client with non-business-related bankruptcy. For females, the risk of a repeat bankruptcy for business-related is 41% lower $[-41\% = 100\% \, (0.59-1)]$ than non-business.

Estimates of associations are hazard ratios representing the decrease in risk of repeat bankruptcy amongst individuals who have business-related bankruptcy compared to individuals who are non-business related.

The magnitude of the hazards ratios for prior bankruptcy indicates a strong effect in both males and females. Figure 1 shows survivor curves for individuals having a bankruptcy between
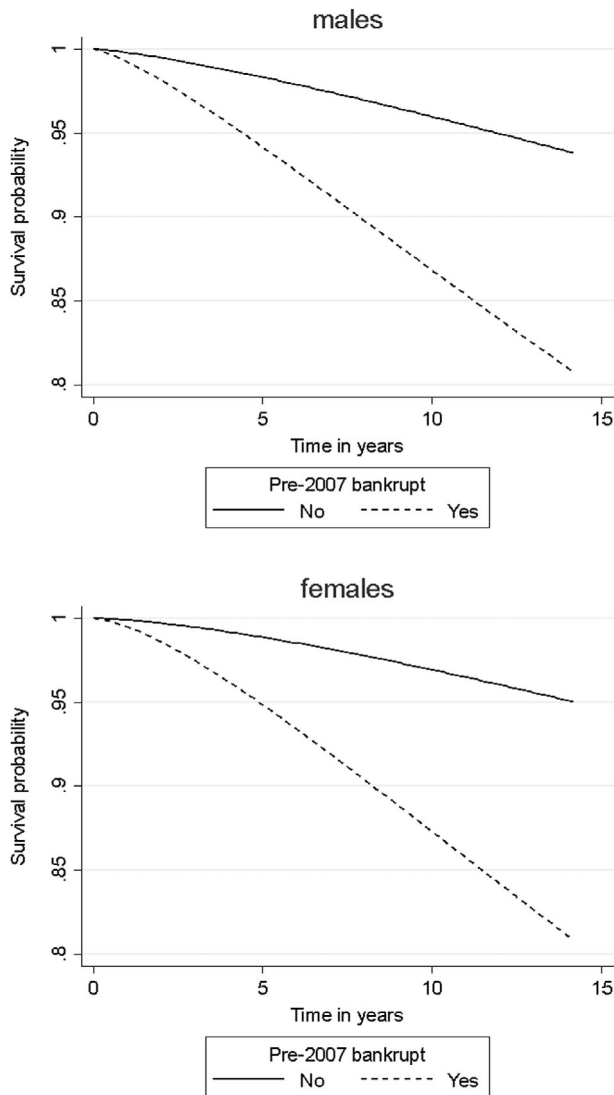
FIGURE 1 Pre-2007 bankruptcy as risk factor for future bankruptcy. *Source*: AFSA data.

1999 and 2007 (versus no prior bankruptcy) and risk for repeat bankruptcy in follow-up period. Both the survivor functions for male and female clients with prior bankruptcy are clearly below the survivor function for no prior bankruptcy. This means that clients with a previous bankruptcy have a greater probability of experiencing a repeat bankruptcy by study time t (number of days).

Table 5 reports the estimates from alternatively specified survival analysis models in order to check the robustness of our primary model. The marginal or population-averaged model estimates the parameters as if the data were single level or non-clustered and takes clustering into account when estimating standard errors. The stratified model is fitted with a different underlying risk for each ordered failure event in addition to robust variance estimation. All models yielded similar results: business-related bankruptcy was associated with decreased risk of repeat

TABLE 5 Associations between business-related bankruptcy and risk of repeat bankruptcy for different types of survival models.

	Males			Females		
	Hazard ratio	95% confidence interval	*p*-value	Hazard ratio	95% confidence interval	*p*-value
Random intercept	0.87	0.81–0.92	0.001	0.59	0.51–0.68	<0.001
Marginal-standard cox regression[a]	0.87	0.81–0.95	0.001	0.59	0.51–0.68	<0.001
Stratified cox regression[a]	0.88	0.81–0.94	0.001	0.60	0.53–0.69	<0.001

Source: AFSA data.

[a]Robust standard errors taking clustering into account.

bankruptcy. Estimated effect sizes were slightly smaller for the random intercept model and the marginal Cox regression with robust standard errors.[97]

Sensitivity analyses were conducted to determine how different values of the cut-off score for determining the minimum score required to keep matched records impacted on survival model estimates. We found that model estimates were mostly in the same direction with some small variation in magnitude. As could be expected, the total number of unique individuals increased with an increase in cut-off score. For example, there were 64,371 females in primary analysis with cut-off score 20.5. For cut-off value 33.9, there were 81,121 individual females. Causes of potential matches being missed included changes in surname across time.

5 | DISCUSSION

There have been no studies that estimate the effect of variables on risk of repeat bankruptcy using the path suggested by Pace (2013).[98] With this article, our aim was to address this issue and extend the discussion on repeat bankruptcies and profiles of debtors. Utilising AFSA's dataset of an Australian national sample of 153,526 bankruptcies for 145,816 debtors between 2007 and 2021, we sought to clarify the risk concentrations of business groups for repeat bankruptcy across a 14-year follow-up period with an eight-year look-back. Consistent with the literature about the US experience with the BAPCA reform, there are concerns with the current Australian proposal to reduce the bankruptcy period from 3 years to 1 year and potential abuse of the system. Yet, there has not yet been any empirical investigation on repeat bankruptcies in Australia to support such view and importantly underpin policy and the proposed reform. Developing a high-quality data workflow to understand the incidence and demographics of repeat bankrupts, as well as future questions concerning repeat bankruptcy, was the basis for our study.

Drawing from the application of mixed-effects survival analysis in corporate insolvency, we estimated the hazards for consumer repeat bankruptcy in different business groups. We found that non-business individuals tended to have greater probability of having a repeat bankruptcy. Interestingly, this finding was not affected by clients' age, employment and relationship status. This finding is important as it draws a clear distinction between the groups and the probability is not impacted by certain demographical differences.

Most notably, the distinction was more evident between males and females and amongst female groups. In terms of males with a bankruptcy between 1999 and 2007, there was an increased risk of repeat bankruptcy post-2007 by a factor of 367% compared to those with no prior history. For females, this risk factor was 490% more likely to experience a repeat bankruptcy. For example, the hazard ratio for business-related female is 0.59. In other words, according to our model, for a given business-related female client, the hazard of a repeat bankruptcy would be 41% *lower* than for a female client with non-business-related bankruptcy. These data present compelling evidence that there is a significantly higher risk of repeat bankruptcy for female non-business-related clients compared to female business-related clients and a higher risk for females compared to males. These findings suggest that more research is needed to examine and address the disparate gender gap and non-business female groups at risk of repeat bankruptcy. Moreover, we found that the risk of repeat bankruptcy significantly increased with an accumulated number of previous administrations.

6 | CONCLUSIONS

6.1 | Practical implications and future research

This case study focussed on Australian business-related or non-business-related bankruptcy clients and analysed the effect of specific variables on the probability of survival of repeat bankruptcy. An important distinction from previous studies on repeat bankruptcy is that we incorporated factors into our sample such as age, gender, employment status and previous bankruptcy between 1999 and 2007.

We conclude that in Australia, non-business individuals have greater propensity for repeat bankruptcy. This risk is increased for female non-business clients and those with previous bankruptcies, and therefore, our findings can assist policymakers and stakeholders to focus policy instruments to increase their chances of survival. Given there are no survival differences across age, employment and relationship status, these might be given lower priority in the context of effect on repeat bankruptcy. By illustrating the application of mixed-effects survival analysis to our case study, we provide insolvency regulators and experts in other jurisdictions with a 'toolkit' for posing straightforward questions for analysing repeat bankruptcy datasets and extending the evidence base on this issue. Future studies might confirm these findings in other jurisdictions.

Our study considered bankruptcies over a long observation window between 2007 and 2021. This timeframe is characterised by periods of global economic stress including the Global Financial Crisis and the ongoing impacts of the pandemic. One such impact seen in Australia is the increase in the number of businesses-related bankruptcies over the last year to historically high levels. This along with the imminent reform to the one-year bankruptcy discharge period and the impact on repeat bankruptcy will be important to properly analyse in future research.

We also identify further research opportunities for more targeted research questions including whether repeat bankruptcy is a significant function of the effect of age interacting with gender and family situation. The quantitative design of the study could be complemented with a thorough qualitative investigation to provide a stronger evidence base of influences on repeat bankruptcy, which are not measured in everyday practice, such as psychosocial stresses at the individual level or domestic violence.

We suggest that insights from further empirical studies will have two key benefits. First, it will respond to the call for data-driven policy and substantively inform those involved in

legislative processes to understand the effectiveness of the bankruptcy regime. Secondly, it properly informs stakeholders who are directly involved with debtors to develop intervention strategies to target at-risk sub-population at key stages. Finally, our analysis is robust in its methodological approach through the use of mixed-effects parametric survival modelling.

6.2 | Limitations

These results should be interpreted in the context of two methodological limitations. First, the data are limited to a small number of debtor characteristics. As outlined in the methodology, the study involved a descriptive design with a targeted finite set of predicters and covariates. As identified earlier, the study focussed on voluntary bankruptcies rather than a mixed population to include compulsory bankruptcies. The observational and retrospective nature of the study also meant that it was not capable of disentangling any conflicts in findings arising from a mixed population (as opposed to those from a homogenous population of voluntary bankrupts). While this limits the generalisability of findings, with respect to the research trajectory, this exploratory study opens the potential to examine this (compulsory bankruptcies) and other characteristics such as socio-economic status, social support networks and geographical location, which may provide further insights into the complex interplay of factors associated with repeat bankruptcy.

While the main objective of this paper was to provide a robust exploratory analysis of repeat bankruptcy when using administrative data, there are other similarly important questions that may be posed by a range of stakeholders. Second, the retrospective study design means that we were unable to estimate the population at risk for different groups of people. Future research should investigate prospective, longitudinal trajectories of individual bankrupts to determine incidence rates and test differential effects of different at-risk groups on proximal risk factors (e.g., unexpected job loss) and risk factors further back in the causal chain (distal influences, e.g., social determinants of economic poverty). A prospective design would also enable the collection of data for potential (time-varying) confounding variables and help facilitate the interpretation of findings within a causal framework. In addition, to allow a more comprehensive and enhanced understanding of repeat bankruptcies, qualitative data from a representative sample could also be collected to help explain the quantitative results (e.g., mixed-methods—explanatory sequential design). For example, findings from a prospective observational study on repeat bankruptcy in compulsory bankruptcies (versus voluntary) could be followed by qualitative interviews to better understand how the experiences of individuals help explain patterns in data relating to financial distress.

ENDNOTES
[1] Iain Ramsay, 'The new poor person's bankruptcy: Comparative perspectives' (2020) 29(S) *International Insolvency Review* S4.

[2] See, for example, Russell Orr and Paul Omar, 'Three waves: The United Kingdom insolvency response to the pandemic' (2021) 30(3) *International Insolvency Review* 323; World Bank Group, 'Overview of Insolvency and Debt Restructuring Reforms in Response to the COVID-19 Pandemic and Past Financial Crises: Lessons for Emerging Markets' (Equitable Growth, Finance and Institutions COVID-19 Notes Finance Series) (World Bank Group, 2021).

[3] See, for example, Aurelio Gurrea-Martinez, 'The Future of Insolvency Law in a Post-Pandemic World' (2021) 31(3) *International Insolvency Review* 385.

[4] Commonwealth of Australia, *Corporate insolvency in Australia* (Parliamentary Joint Committee on Corporations and Financial Services 2023), 92.

[5] Commonwealth of Australia, *Bankruptcy system – options paper* (Attorney-General's Department, 2022), 1.

[6] Commonwealth of Australia, *Personal insolvency discussion paper* (Attorney General's Department, 2023), 1.

[7] See, for example, Jialan Wang et al., 'Bankruptcy and the COVID-19 Crisis' (Harvard Business School Working Paper 21–041, 2020), available at: <https://www.hbs.edu/ris/Publication%20Files/21-041_a9e75f26-6e50-4eb7-84d8-89da3614a6f9.pdf>.

[8] Australian Financial Security Authority, '62.1% of personal insolvencies are in capital cities in June quarter 2021' (Media Release, 29 July 2021), available at: <https://www.afsa.gov.au/newsroom/621-new-personal-insolvencies-are-capital-cities-june-quarter-2021>.

[9] Australian Financial Security Authority, 'Quarterly monthly personal insolvency statistics September 2022', available at: <https://www.afsa.gov.au/about-us/statistics/quarterly-personal-insolvency-statistics>.

[10] Reserve Bank of Australia, 'Statement on Monetary Policy – August 2023', available at: <https://www.rba.gov.au/publications/smp/2023/aug/economic-outlook.html>; Australian Financial Security Authority (*LinkedIn post*, 1 September 2022).

[11] See, for example, Iain Ramsay, 'Towards an International Paradigm of Personal Insolvency Law? A Critical View' (2017) 17(1) *Queensland University of Technology Law Review* 15, 39.

[12] Australian Financial Security Authority, 'Treatment of debts in bankruptcy', available at: <https://www.afsa.gov.au/treatment-of-debts-in-bankruptcy>.

[13] Australian Financial Security Authority, 'Apply for bankruptcy', available at: <https://www.afsa.gov.au/insolvency/cant-pay-my-debts/apply-bankruptcy#:~:text=To%20apply%20for%20bankruptcy%2C%20you,unable%20to%20pay%20your%20debts>. Involuntary bankruptcy is where a creditor may take action to have the debtor declared bankrupt by order of the court: section 77, *Bankruptcy Act 1966* (Cth).

[14] *Local Loan Co v Hunt* 292 US 234 (1934); see, for example, Nicola Howell and Rosalind Mason, 'Reinforcing Stigma or Delivering a Fresh Start: Bankruptcy and Future Engagement in the Workforce' (2015) 38(4) *University of New South Wales Law Journal* 1,529; World Bank, *Report on the Treatment of the Insolvency of Natural Persons* (2013).

[15] See, for example, Paul Ali, Lucinda O'Brien and Ian Ramsay, 'Bankruptcy and Debtor Rehabilitation: An Australian Empirical Study' (2017) 40(3) *Melbourne University Law Review* 688; Will Dobbie, Paul Goldsmith-Pinkham and Crystal Yang, 'Consumer Bankruptcy and Financial Health' (2017) 99(5) *The Review of Economics and Statistics* 853.

[16] Ali, O'Brien and Ramsay (above note 15), 723.

[17] Katherine Porter and Deborah Thorne, 'The Failure of Bankruptcy's Fresh Start' (2006) 92(67) *Cornell Law Review* 67, 87. The authors found that 1 year after bankruptcy filing, 25% of Chapter seven bankrupts were struggling to pay routine bills and 33% had a similar financial situation to that when they filed bankruptcy. Also see, Lois Lupica and Jay Zagorsky, 'A Study of Consumers' Post-discharge Finances: Struggle, Stasis or Fresh Start? (2008) 16 *American Bankruptcy Institute Law Review* 283.

[18] Levi Nelson Pace, 'Debtors in Consumer Bankruptcy: Navigating 2005 Bankruptcy Reform' (DPhil, The University of Utah, 2013), 10.

[19] Teresa Sullivan, Elizabeth Warren and Jay Westbrook, *As We Forgive Our Debtors* (Beard Books, 1989), 192; Jean Lown and Barbara Rowe, 'A Profile of Utah Consumer Bankruptcy Petitioners' (2003) 5 *Journal of Law*

and Family Studies 113; Judith Strand, Tahira Hira and Richard Carter, 'Repeat Consumer Bankruptcy: A Comparative Analysis with One-time Petitioners in the United States and Canada' (Paper delivered at the AFCPE National Conference, Nashville, Tennessee, 8–12 November 1994); John Golmant and Tom Ulrich, 'Bankruptcy Repeat Filings' (2006) 14 *American Bankruptcy Institute Law Review* 169.

[20] Jan-Ocko Heuer, 'Hurdles to Debt Relief for No Income No Assets Debtors in Germany: A Case Study of Failed Consumer Bankruptcy Law Reforms' (2020) 29(S) *International Insolvency Review* S44.

[21] See, for example, Fanyin Zhou et al., 'The recurrence of financial distress: A survival analysis' (2022) 38(3) *International Journal of Forecasting* 1,100; Maria Escribano-Navas and German Gemar, 'Gender and Bankruptcy: A Hotel Survival Econometric Analysis' (2021) 13(12) *Sustainability* 6,782; Robert Kelly, Eoin O'Brien and Rebecca Stuart, 'A long-run survival analysis of corporate liquidations in Ireland' (2015) 44(3) *Small Business Economics* 671; Rajshree Agarwal and David Audretsch, 'Does Entry Size Matter? The Impact of the Life Cycle and Technology on Firm Survival' (2001) 49(1) *The Journal of Industrial Economics* 21; Edward Altman 'Financial ratios, discriminant analysis and the prediction of corporate bankruptcy' (1968) 23(4) *The Journal of Finance* 598.

[22] Jose Garrido et al., 'The Use of Data in Assessing and Designing Insolvency Systems' (IMF Working Paper 19/27) (International Monetary Fund, 2019).

[23] Sullivan, Warren and Westbrook (above note 19), 195.

[24] John King, 'Moving beyond the 'Hard'- 'Easy' Tug of War: A Historical, Empirical and Theoretical Assessment of Bankruptcy Discharge (2004) 28(3) *Melbourne University Law Review* 654. For an overview of Australia's bankruptcy regime see, for example, Paul Lewis, 'Can't Pay Your Debts, Mate? A Comparison of the Australian and American Personal Bankruptcy Systems' (2002) 18 *Bankruptcy Developments Journal* 297.

[25] Idem.

[26] Commonwealth of Australia, *Bankruptcy system – options paper* (above note 5), 2. The exclusions for eligibility for one-year bankruptcy in certain circumstances are bankrupts who, in the previous 10 years, have: been bankrupt, been banned as a director, had bankruptcy extended through an objection to discharge or have been convicted of certain offences.

[27] *Bankruptcy Amendment (Enterprise Incentives) Bill 2017* (Cth) ("Enterprise Incentives Bill"), Explanatory Memorandum, 4.

[28] Commonwealth of Australia, *Bankruptcy system – options paper* (above note 5). The Enterprise Incentives Bill lapsed when the 45th Parliament was prorogued on 11 April 2019.

[29] See, for example, Frank Fossen, 'Personal Bankruptcy Law, Wealth and Entrepreneurship—Evidence from the Introduction of a "Fresh Start" Policy' (2014) 16 *American Law and Economics Review* 269, 274.

[30] See, for example, Jean Lown, 'Serial Bankruptcy Filers No Problem' (2007) *American Bankruptcy Institute Journal* 36.

[31] See, for example, Australian Collectors and Debt Buyers Association, 'Submission to the Bankruptcy Systems Option Paper' (February 2022); Australian Restructuring Insolvency & Turnaround Association, 'Submission to the Bankruptcy Systems Option Paper' (February 2022).

[32] Commonwealth of Australia, *Bankruptcy system – options paper* (above note 5), 3.

[33] Idem.

[34] Lucinda O'Brien, Ian Ramsay and Paul Ali, 'The Distinctive Features of Women in the Australian Bankruptcy System: An Empirical Study' (2019) 54(2) *Australian Journal of Social Issues* 173; Lucinda O'Brien, Malcolm Edward Anderson and Ian Ramsay, 'The Geography of Bankruptcy in Australia' (2020) 28(2) *American Bankruptcy Institute Law Review* 303; Lucinda O'Brien et al., 'More to Lose: The Attributes of Involuntary Bankruptcy'(2018) 38(1) *Economic Papers* 15; Lev Bromberg, Ian Ramsay and Paul Ali, 'The Vulnerability of Older Australians in Bankruptcy: Insights from an Empirical Study' (2018) 39(4) *Adelaide Law Review* 393; Lucinda O'Brien, Ian Ramsay and Paul Ali, 'The Hidden Dimension of Business Bankruptcy in Australia' (2018) 46(5) *Australian Business Law Review* 291; Paul Ali, Lucinda O'Brien and Ian Ramsay, 'Misfortune or Misdeed: An Empirical Study of Public Attitudes Towards Personal Bankruptcy' (2017) 40(3) *UNSWLJ* 1098;

Paul Ali et al., 'The Incidence and Causes of Personal Bankruptcy in Australia' (2016) *Australasian Journal of Applied Finance* 27; Paul Ali, Lucinda O'Brien and Ian Ramsay, 'Bankruptcy, Social Security and Long Term Poverty: Results from a Survey of Financial Counsellors and Consumer Solicitors' (2016) 44(2) *Australian Business Law Review* 144; Paul Ali, Lucinda O'Brien and Ian Ramsay, 'Short a Few Quid': Bankruptcy Stigma in Contemporary Australia (2015) 38(4) *University of New South Wales Law Journal* 1,575.

[35] Sophia Rabe-Hesketh and Anders Skrondal, *Multilevel and longitudinal modeling using Stata* (fourth edn) (Stata Press, 2022).

[36] See, for example, Australian Criminal Intelligence Commission, 'Submission to the Senate Standing Committee on Legal and Constitutional Affairs, Inquiry into the *Bankruptcy Amendment (Enterprise Incentives) Bill 2017* (Cth)' (5 February 2018). The Australian Criminal Intelligence Commission advised that its intelligence suggested that reducing the default bankruptcy period 'may increase the potential for serious and organised crime groups to exploit bankruptcy provisions for their own advantage'.

[37] See, for example, Shai Bernstein et al., 'Bankruptcy spillovers' (2018) 133(3) *Journal of Financial Economics* 608; Johanna Niemi et al. (eds), *Consumer Credit, Debt and Bankruptcy: Comparative and International Perspectives* (first edn) (Bloomsbury Publishing, 2009); David Himmelstein et al., 'Medical Bankruptcy in the United States, 2007: Results of a National Study' (2008) 122(8) *The American Journal of Medicine* 741.

[38] Zachary Price, 'The Bankruptcy Abuse Prevention and Consumer Protection Act' (2002) 39 *Harvard Journal on Legislation* 237.

[39] See, for example, Teresa Sullivan, Elizabeth Warren and Jay Westbrook, *As We Forgive Our Debtors: Bankruptcy and Consumer Credit in America* (OUP, 1989); Lown and Rowe (above note 19); Strand, Hira and Carter (above note 19); Paul Lewis, 'The Repeat Bankruptcy Filer: Some Economic Considerations' (2000) 10 *New Directions in Bankruptcy* 18; Golmant and Ulrich (above note 19); Lown (above note 30); Lance Miller and Michelle Miller, 'Repeat Filers Under the BAPCPA: A Legal and Economic Analysis' (2008) *Norton Annual Survey of Bankruptcy Law* 509.

[40] Porter and Thorne (above note 17).

[41] See, for example, Lewis (above note 24).

[42] Sullivan, Warren and Westbrook (above note 39), 192.

[43] Porter and Thorne (above note 17), 12.

[44] Lown and Rowe (above note 19).

[45] Jean Lown and Barbara Rowe, 'A Profile of Consumer Bankruptcy Petitioners' (Annual Conference of Association for Financial Counseling & Planning Education, Scottsdale Arizona, 20–23 November, 2002), available at: <https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=2032&context=extension_histall>.

[46] Bonnie Llewellyn and Jean Lown, 'Are debtors abusing bankruptcy by repeat filings?' (2005) *Consumer Interests Annual* 54.

[47] Sullivan, Warren and Westbrook (above note 39).

[48] Sara Sternberg Greene, 'The Failed Reform: Congressional Crackdown on Repeat Chapter 13 Bankruptcy Filers' (2015) 89 *American Bankruptcy Law Journal* 241, 246.

[49] Golmant and Ulrich (above note 19).

[50] Sullivan, Warren and Westbrook (above note 39), 242.

[51] Lewis (above note 39).

[52] Laura Bartell, 'Stay Imposed- The Failed Policy of Section 362(c)(4)' (2015) 89 *American Bankruptcy Law Journal* 165; Sternberg Greene (above note 48).

[53] Sullivan, Warren and Westbrook (above note 39), 252.

[54] Sullivan, Warren and Westbrook (above note 39), 262.

[55] Katherine Porter, 'Repeat Studies of Repeat Filers: How We Should Learn About Law' (2015) 89(2) *The American Bankruptcy Law Journal* 159.

[56] Porter and Thorne (above note 17).

57 Ibid., 61.

58 Idem.

59 For an explanation of differences in bankruptcy filing rates across states in the US, see, for example, Lars Lefgren and Frank McIntrye, 'Explaining the Puzzle of Cross-State Differences in Bankruptcy Rates' (2009) 52(2) *Journal of Law and Economics* 367, 369.

60 *Re Resnick* (1990), 80 80 C.B.R. (N.S.) 223 (Ont. S.C.); Thomas Telfer, 'Repeat Bankruptcies and the Integrity of the Canadian Bankruptcy Process' (2014) 55 *Canadian Business Law Journal* 231.

61 Telfer (above note 60).

62 Judith Strand, Tahira Hira and Richard Carter, 'Repeat Consumer Bankruptcy: A Comparative Analysis with One-time Petitioners in the United States and Canada', in Ruth Lytton (ed), *Proceedings of the Association for Financial Counseling and Planning Education* (AFCPE, 1994).

63 Ibid.

64 Bonny Llewellyn, 'A Profile and Analysis of Repeat Bankruptcy Petitioners in the District of Utah 1984–2004' (MScience thesis, Utah State University, 2005), 18.

65 Ibid, 43.

66 Telfer (above note 60), 44.

67 Idem.

68 Telfer (above note 60), 47.

69 Porter and Thorne (above note 17), 112.

70 Ibid., 46.

71 Ibid., 44.

72 Telfer (above note 60), 26.

73 Porter and Thorne (above note 17), 44.

74 Telfer (above note 60), 18.

75 Porter and Thorne (above note 17), 46. Pace noted the sample data were obtained from the following sources: Sample data; Mortgage Bankers Association National Delinquency Survey; New York Federal Reserve Bank's Consumer Credit Panel; US Census Bureau's American Community Survey, American Fact Finder, Current Population Survey and 2011 and 2012 Statistical Abstracts.

76 See, for example, Da Ke, 'Who Wears the Pants? Gender Identity Norms and Intrahousehold Financial Decision Making' (2021) 76 *The Journal of Finance* 1,389; Priyanka Carr and Claude Steele, 'Stereotype Threat Affects Financial Decision Making' (2010) 21(1) *Psychological Science* 1,411; Coren Apicella et al., 'Testosterone and financial risk preferences' (2008) 29 *Evolution and Human Behaviour* 384; Kevin Campbell and Antonio Mínguez-Vera, 'Gender diversity in the boardroom and firm financial performance' (2008) 83(3) *Journal of Business Ethics* 435.

77 Jaka Cepec and Peter Grajzl, 'Management turnover, ownership change and post-bankruptcy failure of small businesses' (2021) 57(1) *Small Business Economics* 555.

78 Michael Read, 'Bankruptcy laws to be reviewed amid jump in business failures' (*Australian Financial Review*, 28 September 2022).

79 Australian Small Business and Family Enterprise Ombudsman, 'Contribution to Australian Business Numbers' (August 2022), available at: <https://www.asbfeo.gov.au/contribution-australian-business-numbers>.

80 Martina Topic et al., 'Women in SMEs: A Systematic Literature Review (2000–2021)' (Technical Report) (Leeds Beckett University, 2021).

81 Ibid., 10.

82 Ibid., 11.

83 Sharon Simmonds et al., 'Gender gaps and reentry into entrepreneurial ecosystems after business failure' (2019) 53 *Small Business Economics* 517.

[84] Australian Bureau of Statistics, 'A Profile of Australian Women in Business' (Report prepared by the Australian Bureau of Statistics for the Office For Women) (2015), available at: <https://www.pmc.gov.au/sites/default/files/publications/profile_of_australian_women_in_business.pdf>; Advisory Board Centre, 'Achieving Scale: Breaking Through Barriers for Female Founders' (2020), available at: <https://www.advisoryboardcentre.com/wp-content/uploads/2022/01/Achieving-Scale-Female-Founders-Report-2020_compressed-1.pdf>.

[85] Australian Bureau of Statistics (above note 84), 8.

[86] Simmonds et al. (above note 83). Gender is a better analysis than biological sex, for which see Kimberley Eddleston, 'The Role of Gender Identity in Explaining Sex Differences in Business Owners' Career Satisfier Preferences' (2008) 23(2) *Journal of Business Venturing* 244.

[87] Zijiang Yang, Wenjie You and Guoli Ji, 'Using partial least squares and support vector machines for bankruptcy prediction' (2011) 38(7) *Expert systems with Applications* 8,336.

[88] See, for example, Zhou et al. (above note 21); Altman (above note 21); Escribano-Navas and Gemar (above note 21).

[89] German Gemar, Ismael Soler and Vanesa Guzman-Parra, 'Predicting bankruptcy in resort hotels: a survival analysis' (2019) 31(4) *International Journal of Contemporary Hospitality Management* 1,548. Also see Heuer (above note 20).

[90] Cepec and Grajzl (above note 77).

[91] Chapter 12 bankruptcies are designed for the "family farmers" or "family fishermen" to propose and carry out a plan to repay all or part of their debts.

[92] Robert Dinterman and Ani Katchova, 'Survival analysis of farm bankruptcy filings: Evaluating the time to completion of chapter 12 bankruptcy cases' (2020) 37 (2) *Agribusiness* 324, 325.

[93] Ibid., 342.

[94] See, for example, Reserve Bank of Australia, 'Statement on Monetary Policy – August 2023' (above note 10).

[95] Joe Twisk, Nynke Smidt and Wieke de Vente, 'Applied analysis of recurrent events: a practical overview' (2005) 59 *Journal of Epidemiology and Community Health* 706.

[96] Peter Austin, 'A Tutorial on Multilevel Survival Analysis: Methods, Models and Applications' (2017) 85(2) *International Statistical Review* 185.

[97] Estimates of associations are hazard ratios representing the decrease in risk of repeat bankruptcy among individuals who have business-related bankruptcy compared to individuals who are non-business related. Models were adjusted for age, age squared, relationship status, employment status and prior bankruptcy.

[98] Porter and Thorne (above note 17).