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INSIGHTS INTO THE IMPACT OF BANKRUPTCY'S PUBLIC RECORD ON ENTREPRENEURIAL ACTIVITY: EVIDENCE FROM ECONOMIC EXPERIMENTS

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ABSTRACT

Many Anglo-American jurisdictions aim to provide debtors with a 'fresh start' after a personal bankruptcy. However, we query the extent to which debtors can achieve a fresh start if records of individual bankruptcies are publicly available, with no restrictions on their use.

To inform the legal policy question of whether bankruptcy records should be publicly available, we study the effect of the availability of bankruptcy records, compared to their non-existence, in an economic experiment. The experiment allows us to identify empirically the effect that the exposure of bankruptcy history has on the behaviour of investors and debtors. Our exploratory research shows that the availability of bankruptcy records increases investment. Availability also increases repayment behaviour by debtors, but only if the debtor has no history of bankruptcy (non-return of payments). If, however, a debtor failed to return payments in the past, and this information is available, debtors show lower instances of return behaviour.

Keywords: bankruptcy, investments, uncertainty, economic experiment, insolvency, public records, National Personal Insolvency Index

JEL Codes: K35, D47, C90

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I. INTRODUCTION

In this paper, we explore the impact of the public availability of personal insolvency information. Many jurisdictions that offer a personal insolvency option also provide for a public record of such insolvencies, although the time period for which such information is available varies markedly between jurisdictions.

The public availability of personal insolvency information is designed to protect creditors, consumers and the community generally; it lets businesses and others know whether the person that they are dealing with, or proposing to deal with, has previously experienced issues of insolvency and allows them to take account of that information in decision making.

However, the public availability of personal insolvency information can adversely affect the ability of a natural person debtor to obtain a genuine ‘fresh start’ at the conclusion of their bankruptcy¹ (or other personal insolvency administration). For example, decisions about future business opportunities, employment and/or housing might be adversely affected when the decision-maker knows of the person’s current or past insolvency. Thus, there is a potential tension between protecting creditors and others through the public record of insolvency administrations, and providing the possibility of a fresh start for the natural person debtor. This is particularly the case when an insolvency may have resulted from causes largely or partially outside the debtor’s control. This tension translates into the legal policy question of whether information about insolvency administrations should be publicly available, and if so, for what period of time, and with what restrictions. Collecting better information about the impact of disclosure of insolvency information can assist in resolving this legal policy question.

There is official bankruptcy or personal insolvency data published in many jurisdictions, however, this data is rarely helpful in exploring the issue of concern. In most cases, official data is collected at the commencement of an insolvency administration; and little, if any, data is collected on post-administration

¹ In some jurisdictions, including Australia, bankruptcy is only available to natural persons. Throughout this paper, we refer to personal bankruptcy or personal insolvency to clarify that our research focuses only on the insolvency of natural persons.

outcomes.² Further, to the extent that such data is collected, it is data on the behavior of the insolvent person; data on the behavior and decisions of others dealing, or considering dealing with, the insolvent or recently insolvency person is not collected in the official insolvency statistics.

This paper therefore reports on an experimental law and economics research project, designed to explore the extent to which disclosure of history impacts on an investor's decision to invest funds in a business.³

We can use the results of the laboratory experiments to gain some initial insights into:

- The impact that disclosure or non-disclosure of past history (positive or negative) has on a potential creditor's decision to provide funds for an investment; and
- The impact that a person's knowledge that their history will or will not be disclosed has on the likelihood of that person returning funds to the creditor.

While such an experimental approach can limit the generalisability of the findings (as we discuss in the paper), it allows us to keep conditions constant and study the effects of information disclosure on both investors and creditors.

This paper first provides some background to the legal policy question of whether, and if so, for how long and with what restrictions, information about personal insolvency administrations should be made publicly available. The next part of this paper explains in detail the experimental methodology used to explore decisions based on disclosure of past behaviour. In our experimental design, we have built upon the traditional investment game (Berg, Dickhaut and McCabe 1995) and factored in the uncertainties associated with insolvency, for example that insolvency may be a result of some failing of the debtor, or may result from external factors, or may result from a combination of internal and external factors. We then provide the results of our experiments and discuss the findings and their implications for personal insolvency policy.

² As an example, see the official statistics published in Australia: Australian Financial Security Authority (2018). "Statistics". <https://www.afsa.gov.au/about-us/statistics> (last accessed 8 June 2018).

³ For a recent discussion on the use of experiments in empirical legal research, see van den Bos and Hulst (2016).

There are two key findings from this research that may be relevant for policy decisions about the status of personal insolvency information. First, we find that disclosure of the history of past performance in the investment game has generally a positive effect. It leads to greater levels of investment, and greater returns by the recipient of the invested funds. Second, if a case of a previous failure to return an investment is annotated in the records, investors are less willing to invest. Recipients, on the other side, are highly motivated to return the payments to the investor when the past failure was unintentional. In this result, we see empirical evidence for the worrying effect of negative stigmatization.

Applying these findings to the personal bankruptcy context suggests that disclosure of bankruptcy history (for example, through a public register) could be expected to have more positive effects on levels of investment in businesses initiated by persons who have not previously been bankrupt, when compared to no disclosure of bankruptcy history. For persons who have previously been bankrupt, the availability of such records would have a detrimental effect on their ability to obtain investment funds. This might be an argument against the retention of insolvency information as a permanent public record.

However, we caution that more research is needed to confirm this effect. As a first study, we compared only full history with no history, and it may be that the positive effects found in this scenario could also be generated through disclosure of only the most recent history, with a consequent reduction in the adverse impacts on the debtor of disclosure, perhaps providing a better balancing of the tensions between community interests and debtor interests.

In addition, in our study, the history of past behaviour was automatically provided to the investor, with no transaction costs involved, and no requirement for the investor to know of the availability of the information. In practice, however, there are often costs associated with seeking out this information, including at least in some jurisdictions, a fee for accessing the information. Furthermore, our study assumes that there are no restrictions on successive defaults or personal insolvencies, when in practice, some jurisdictions impose restrictions on the ability of a natural person to file for bankruptcy or another personal insolvency administration a second time.

Also, our research focused on the impact of disclosure in a business context. We have not explored the extent to which the findings could be applied to decision making in relation to consumer debtors – for example, decisions to employ or provide housing to an individual who is currently in an insolvency administration, or has previously been in an insolvency administration.

Lastly, we have conducted our study with students and in the neutral setting of a laboratory experiment, while this helps to identify important decision factors and behavioural patterns, caution is needed when these results are conveyed to real world settings.

Adapting our experimental approach to take into account these issues would provide for a greater insight into the impact of public disclosure of personal insolvency information.

II. THE PUBLIC AVAILABILITY OF PERSONAL INSOLVENCY INFORMATION

A. NATURAL PERSON BANKRUPTCY AND THE FRESH START

In this paper, we use a behavioural economics approach to provide insights into the impact of the public availability of personal insolvency information. We hypothesise that public availability of this information will often have an adverse effect on debtors, harming their ability to improve their financial and employment or business position after completing an insolvency administration.

If our hypothesis is correct, this would run counter to one of the primary goals of a modern personal insolvency system – that is, to provide a debtor with the opportunity for a ‘fresh start’, sometimes also referred to as ‘economic rehabilitation’, as we discuss below. This ‘fresh start’ goal is particularly apparent in Anglo-American insolvency systems. For example, in 1934, the United States Supreme Court emphasised that bankruptcy has both public and private interests, in that:

‘it gives to the honest but unfortunate debtor (...) a new opportunity in life and a clear field for future effort, unhampered by the pressure and discouragement of pre-existing debt’ (Local Loan Co. v. Hunt, 291 U.S. 234, 244 (1934)).

There is not always clarity or consistency about the scope and meaning of the fresh start that is to be provided to debtors (see, for example, Gross 1999; Howell 2014). Most commentators agree or imply that the fresh start goal requires a discharge of debt (see, for example, Whitford 1997; Buckley 2003); however, some also suggest that discharge of debt alone will not necessarily provide debtors with a ‘true’ fresh start (Zagorsky & Lupica 2008; Gross and Block-Lieb 2005).

A comprehensive report for the World Bank exemplifies this latter approach. The main objective of this report was to ‘provide guidance on the characteristics of an effective insolvency regime for natural persons and on the opportunities and challenges encountered in the development of such a regime’ (World Bank 2013: 4). Although not seeking to identify any set of ‘best practices’ for personal insolvency regulation, the report proposed that ‘One of the principal purposes of an insolvency system for natural

persons is to re-establish the debtor's economic capability, in other words, economic rehabilitation.' (World Bank 2013: 117).

For this report, this concept of economic rehabilitation encompasses discharge of debt, a feature of fresh start systems (World Bank 2013: 117). However, the report suggests that this 'freedom from excessive debt' is not sufficient. The report argues that economic rehabilitation also requires treatment of the debtor on an equal basis with non-debtors after receiving relief (the principle of non-discrimination), and the debtor being able to avoid becoming excessively indebted again in the future (World Bank 2013: 117).

It is the principle of non-discrimination (the second component of the report's definition of economic rehabilitation) that we focus on in this paper, in part responding to the call from the World Bank report for greater attention to be paid to this issue (World Bank 2013: 119). Other researchers, particularly in the United States, have begun to explore the policy and normative questions about the extent to which discrimination against persons on the ground of a previous personal insolvency and/or credit history should be permitted or restricted. (See, for example, Thorne 2008; Shepard 2012; Shepard 2014; Traub 2013).

We note that the legal policy question under discussion here has some parallels with the literature on discrimination in employment and other settings on the grounds of a criminal record. For example, in the Australian context, Heydon et al (2011: 206) have argued that:

'Discrimination on the basis of criminal record not only deprives an individual of independence and livelihood but also reduces the potential contribution of that individual to the economy and diminishes the pool of labour and skills available to employers and society generally. The case studies above illustrate this clearly. More broadly, it undermines the principle that people who have 'served their time' should be able to make a fresh start.'

As with a previous insolvency administration, someone with a criminal record can, depending on the jurisdiction, be denied employment or other services on the grounds of a criminal record, even where the

existence of that criminal record has little correlation to ability or suitability for the position in question.⁴ Further similarities emerge in the fact that many jurisdictions have a spent convictions regime where, if certain criteria are met, a previous conviction is no longer treated as part of a person's criminal record (for Australia, see Human Rights and Equal Opportunity Commission 2004: 51). This may be seen as analogous to a public record of insolvency administrations that provides for the insolvency record to be deleted after expiry of a specified period of time. Deliberations on the circumstances in which the presence or absence of a criminal conviction can be assessed as an inherent requirement of a particular position, or whether discrimination on the grounds of a criminal record should be prohibited (eg, Australian Law Reform Commission 1987: 54-5; Heydon et al, 2011; Lam and Harcourt 2003) can also provide some parallels in the context of personal insolvency.

Our research is relevant to the principle of non-discrimination in a different sense to the normative question discussed in other studies about the relevance or otherwise of an insolvency administration to employment and business decision making.

We start with the observation that discrimination against persons who are, or have previously been involved (as a debtor) in a personal insolvency administration, is at least *facilitated* by the public availability of personal insolvency information, and that there is some evidence that a previous personal insolvency (or poor financial history) is correlated with adverse employment or business outcomes (see, for example, Traub 2013; Thorne 2008). This suggests that there are competing policy objectives here, where the policy objective of protecting the public through disclosure of personal insolvency information inhibits the achievement of the policy objectives of reducing discrimination and providing a fresh start for debtors who have exited a personal insolvency administration.

Existing research does not isolate the extent to which information about a previous personal insolvency influences decision-making. Using an experimental methodology, we can isolate the impact of disclosure

⁴ In Australia, there are differing laws on spent convictions and on the extent to which discrimination on the grounds of a prior conviction is prohibited, see Human Rights and Equal Opportunity Commission, *Discrimination in employment on the basis of criminal record* (Discussion Paper, December 2004).

of previous behaviour from other influences on decision-making, and thus extrapolate from the findings to explore the potential consequences of the availability of personal insolvency information.

As the first (to our knowledge) experimental exploration of this issue in a personal insolvency context, our research explores the impact of the availability of personal insolvency information in the context of business investment decisions, rather than in other contexts (for example, employment decision-making). We apply an experimental approach to answer empirically the questions raised in the discussion above.

Our focus on the business context is preferred because many jurisdictions are focused on creating a business and regulatory landscape that is conducive to business start-ups, innovation, and entrepreneurship. For example, the European Commission has established a Competitiveness of Enterprises and Small and Medium-sized Enterprise Programme for 2014-2020 ('COSME'), which aims to 'promote entrepreneurship and improve the business environment for SMEs to allow them to realise their full potential in today's global economy' (European Commission 2017a). Access to finance can be a critical issue for innovative new businesses (European Commission 2017b, Productivity Commission (Australia) 2015: 126-7). Understanding the impact of disclosure of a previous personal insolvency on potential investors and debtors themselves can assist in identifying the appropriate policy settings to balance the competing bankruptcy goals and to encourage investment and external financing for new and innovative businesses.

B. THE LEGAL FRAMEWORK GOVERNING DISCLOSURE OF PERSONAL INSOLVENCY INFORMATION

To provide some context for our research, we outline the Australian legal framework in that governs the availability of personal insolvency information, and briefly compare it with some other jurisdictions.

In Australia, a public record of personal insolvency administrations (the National Personal Insolvency Index – 'NPII') is administered by the Australian Financial Security Authority ('AFSA'). The NPII includes information on bankruptcies, other personal insolvency administrations, and other matters (Bankruptcy Regulations 1996 (Cth), reg 13.03(1); sch 8). For each insolvency administration, the debtor's personal information recorded in the NPII includes their full name and any alias, date of birth,

address, and occupation (Bankruptcy Regulations 1996 (Cth) reg 13.03(1)(e); Australian Financial Security Authority 2017, 3.8 and 3.11).

Access to an extract from information on the NPII is available to any person on payment of a small fee (Bankruptcy Regulations 1996 (Cth), reg 13.06), and no conditions or restrictions on the use of information in the NPII have been imposed despite a power in the Inspector-General in Bankruptcy to do so Bankruptcy Regulations 1996 (Cth), reg 13.06(5)).

Bankruptcy information contained in the NPII is retained permanently on the Index, although there are some limited exceptions (Bankruptcy Regulations 1996 (Cth), reg 13.04).⁵ Thus, a past bankruptcy remains permanently on the public record, and is never erased, even after the passage of a lengthy period. In contrast, recent amendments require information about debt agreements and debt agreement proposals (another type of insolvency administration) to be removed from the NPII after a prescribed period (Bankruptcy Regulations 1996 (Cth), reg 13.05A, 13.05B). The decision to exclude this information from permanent public access was made, in part, to encourage debtors to enter a debt agreement (where appropriate) instead of applying for bankruptcy (Bankruptcy Amendment (National Personal Insolvency Index) Regulation 2015, Explanatory Statement).

The explanatory material for the introduction of the NPII explained that the index enables persons entering substantial transactions to know whether they are dealing with someone who is an undischarged bankrupt or a debtor in another type of insolvency administration (Bankruptcy Legislation Amendment Bill 1996, Explanatory Memorandum). However, none of the Bankruptcy Act, Bankruptcy Regulations, or policy statements impose any restrictions on the use of the information contained in the NPII, so that use of the NPII by third parties is not restricted to this purpose.⁶ Although Australia has anti-discrimination laws at Commonwealth, State and Territory level, insolvency status is not a proscribed

⁵ These exceptions include where removal of information is directed by a relevant court; where the entry was based on a forged process; or where there has been an administrative oversight that occurred during processing (Australian Financial Security Authority 2017, 7.1) Also, a debtor can ask for some information (including their address, but not their name or date of birth) to be removed from the Index on the grounds that it may jeopardise the debtor's safety, or it is inaccurate or misleading (Bankruptcy Regulations 1996 (Cth), reg 13.04).

⁶ AFSA gives a much broader statement of the purpose of the NPII as being 'to provide publicly available information regarding the insolvency status of individuals.' (AFSA 2017, 3).

ground of discrimination,⁷ and, unlike the European Union, there is no ‘right to be forgotten’ available in Australia (Australian Law Reform Commission 2014a). There is therefore no clear proscription against accessing and using personal insolvency information in business decision making, or in many other areas of social and economic life (see, for example, Howell and Mason 2015).

Recently, there has been a focus on ensuring that legal and policy settings encourage innovation, business start-ups, and entrepreneurial activity. One proposal arising from this focus on innovation and entrepreneurialism has been to reduce the minimum bankruptcy period from 3 years to 1 year, and a Bill to implement this change has been introduced in the Australian Parliament (Bankruptcy Amendment (Enterprise Incentives) Bill 2017). However, there is currently no proposal to remove the permanent nature of the public record of bankruptcy information (Australian Government 2016: 8).

Australia is not the only country that retains a permanent public record of bankruptcy and other insolvency administrations. For example, in the United States, bankruptcy administrations proceed through the court system, and there is a public register of case and docket information from bankruptcy courts (among others) (Administrative Office of the US Courts (undated)). These records are available through the *PACER* system for a small fee, and there does not appear to be any provision for deleting records, or removing public access to these records (Administrative Office of the US Courts (undated)). Similarly, in Ireland, bankruptcy information is retained permanently on the public register, and can be searched at the Office of the Examiner of the High Court (Insolvency Service of Ireland (undated)). Bankruptcies must also be advertised in the *Iris Oifigiúil* (the Irish State Gazette), and published on the website of the Insolvency Service of Ireland (Companies (Miscellaneous Provisions) Act 2013 (Ireland) s 10).

⁷ For example, under Commonwealth legislation, discrimination on the grounds of sex, race, disability, and age is prohibited, as is discrimination on the grounds of criminal or medical record (see discussion above in relation to criminal records), trade union activity, marital or relationship status, and other matters. However, bankruptcy or insolvency is not a proscribed ground. See, for example, *Sex Discrimination Act 1984* (Cth), *Disability Discrimination Act 1992* (Cth), *Age Discrimination Act 2004* (Cth), *Racial Discrimination Act 1975* (Cth), *Australian Human Rights Commission Act 1986* (Cth), Australian Human Rights Commission Regulations 1989 (Cth).

However, several comparable jurisdictions place a time limit on the extent to which the information is publicly available. For example, in New Zealand, a bankruptcy information is retained on a public register for a period of four years after the date of discharge, and must be removed from the register after that time (*Insolvency Act 2006* (New Zealand), s 449(4)). However, the information will be retained permanently if a person has been involved in more than one insolvency administration as a debtor (*Insolvency Act 2006* (New Zealand), s 449A). The register is available through an online, public search function, and there is no charge for basic searches (New Zealand Insolvency and Trustee Service 2017).

In the United Kingdom, bankruptcy information is included on the individual insolvency register for only three months after discharge from bankruptcy (Insolvency (England and Wales) Rules 2016, r 11.17). This was reduced from two years in 2004, as part of a raft of changes to insolvency laws (Walters 2005, 86). The register is free to search, either online or in person at a local receiver's office (The Insolvency Service 2017). And in Singapore, bankruptcy information is included on the public record, and can be inspected for a nominal fee.⁸ However, a person's record cannot be inspected if at least 5 years have passed since bankruptcy discharge and the person has paid their required monetary contribution (the target contribution) in full (Bankruptcy Rules, R 1 G.N. No. S 269/1995, rev edn 2006, r 273).

Thus, there is no consensus on the appropriate timeframe during which information about personal bankruptcy (or other personal insolvency administrations) should remain on the public record. Research that explores the decisions of potential investors in light of the availability of this information can help to inform this important policy debate.

⁸ At the time of writing, the fee for an online search was \$6: Singapore Bankruptcy (Fees) Rules, R 3 G.N. No. S 271/1995, rev edn 2002, Table B (item 10).

III. BACKGROUND: ECONOMIC EXPERIMENTS

Determining appropriate legal responses to difficult social and economic issues can be assisted by insights from behavioural research. As Jolls (2007, 2) notes, '[b]ehavioural law and economics attempts to improve the predictive power of law and economics by building in more realistic accounts of actors' behaviour'. In this paper, we use the results from behavioural experiments to identify the likely responses to the availability of personal insolvency information. With a greater understanding of how the actors (here, investors and debtors) are likely to respond in practice to particular policy settings, better-informed decisions can be made.

In this section, we therefore introduce economic experiments as a research tool to investigate behaviour in decision situations. Readers who are not familiar with experiments as a research method are first given an overview of the state of art. We then summarise findings of experimental or behavioural studies that can provide insights to our research questions: How do people react to records of past behaviour?

Economic (laboratory) experiments provide a controlled environment to test how debated potential changes in economic and/or legal environments affect individuals' behaviour (see Kagel and Roth 1995, for an overview). This line of thought goes back to Chamberlin (1948) who argues that when relying on real world data social and economic research suffers from "unwanted variables, (which) cannot be held constant or eliminated (...) because the real world of human beings, firms, markets, and governments cannot be reproduced artificially" (Chamberlin 1948: 95). Chamberlin suggests that it is therefore preferable to conduct experiments instead which keep the abstract feature of the decision under consideration.

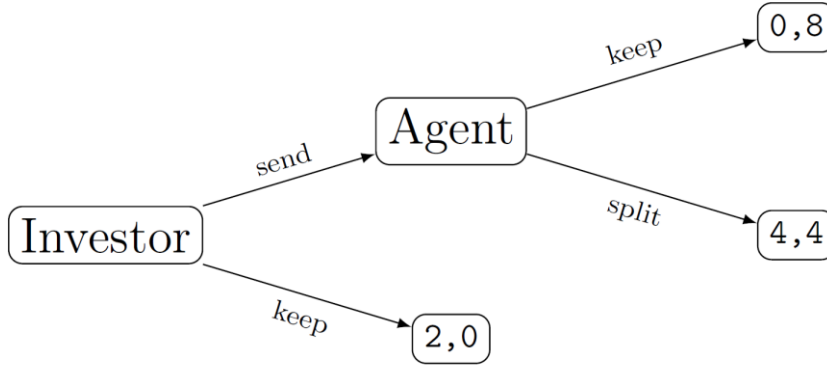
Repeatedly, experimental evidence has been shown to be a good predictor of qualitative behavioural changes, although not necessarily for the size of an effect (Charness and Kuhn 2010). Results derived in laboratory experiments indicate the direction of behavioural changes, but the size of the effect will differ between the laboratory and the real world. However, the existing evidence is robust to argue that qualitative results are valid to inform a policy debate about behavioural effects of, for example, the public availability of personal insolvency information.

In the following, we use a simple and well established economic experiment used to study investor and debtor behaviour, namely the investment game. In this setting, we vary whether records of the debtor's past behaviour are available or not. Our design allows us to investigate changes in investor as well as debtor behaviour.

Traditionally the investment game (Berg, Dickhaut and McCabe 1995) is used in Experimental Economics to study trust and reciprocity in investment settings. In the game, pairs are formed randomly and in each pair one player is selected to be the first player, also called Sender or Investor. Each Investor is then equipped with an endowment, which he or she can choose to keep or send (invest) to the second player, also called Recipient or Agent. Any amount the Investor decides to transfer to the Agent is multiplied by the experimenter and given to the latter.

In a second step, the Agent can decide to either keep the entire amount or send a fixed amount of money back to the Investor. The amount in this second transfer is not multiplied and the game ends after this transfer. To take an example. Player 1, the Investor, receives an endowment of \$2 and decides to send the money to the second player, the Agent. In the transfer, the experimenter quadruples the amount and the receiving Agent can decide whether to keep the generated \$8 (in which case, the Investor does not receive any funds) or split the surplus with the Investor. In this case, both players receive \$4. However, if the Investor decides in the first place to keep the money, he or she receives \$2 and the second player (the Agent) receives \$0. From a social welfare perspective, both players are in this case worse off. Figure 1 illustrates the decision tree of this example.

Figure 1: Standard investment game



In the setting of the investment game, several studies analysed behavioural patterns that are of interest for our research question. Keser (2002) investigated the behavioural impact of rating systems. Based on information about the previous play, Investors decided whether an Agent is rated as positive, neutral or negative. In a ‘short-run reputation’ treatment, prior to play the Investor sees the rating from the most recent round; in a ‘long-run reputation’ treatment, the entire history of ratings is available to the Investor. Both information treatments led to an increase in cooperative behaviour, this means players in role of the Investors sent money to the Agent more often and the Agents reciprocated the favour and split the surplus with their interaction partners. However, the effect was stronger with the long-run reputation mechanism.

Bolton, Katok and Ockenfels (2004) and Huck, Lunser and Tyran (2006) allow Investors to see Agents’ entire histories. The results are mixed. Huck, Lunser and Tyran do not find an effect of this extra information on cooperation levels, whereas Bolton, Katok and Ockenfels find that cooperation increases. Following up on these findings, Brach and Feltovich (2009) show that only a small amount of the Agent’s history (the most recent action) is sufficient for an improvement in cooperation. This result again stands in contrast to Keser (2002), who found that the positive effect of a reputation mechanism is stronger when the mechanism is for the long run. We assume that these opposing results are due to the strong reliance of the history effect on the content of the history. We expect history records have a positive effect on cooperation when the records reveal cooperative action in the past. If, however, the records show a default

in the past the effect might be detrimental. It is unclear whether under such circumstances more observational data from the past promotes or hinders cooperation.

In all previously mentioned studies, the choice of individuals (whether to invest and to return) is perfectly observable and known by both transaction parties. However, for our experiment to mirror the bankruptcy context, it needs to take account of the fact that, in reality, personal bankruptcy is often the result of a concurrence of several factors, including internal factors (such as poor or fraudulent decision-making by the debtor), but also external factors. A sole trader, for example, may be the supplier to a larger business and failure of this business causes the sole trader to go bankrupt.⁹ This implies that, similar to Keser's rating experiment (2002) and contrary to the other studies, our history records are not perfectly accurate signals of the characteristics of the interaction partner (Agent). To account for the impact of external factors we therefore added in our experiment an element of uncertainty in transactions. This extension also allows our paper to contribute to the existing literature.

⁹ In Australia, the most common self-reported reasons for business-related personal insolvencies in 2016/17 were: other business reasons (37.8%) and economic conditions (31.4%): Australian Financial Security Authority. 2018. "Causes of personal insolvency" <https://www.afsa.gov.au/statistics/causes-personal-insolvency> (last accessed 30 April 2018).

IV. DESIGN

In this study, we designed a laboratory experiment to test whether public records of past behaviour affect the Agent's decision-making and the behaviour of potential interaction partners (Investors). For this purpose, we modified the standard investment game (Berg, Dickhaut and McCabe 1995) and varied whether Investors receive information about the past actions of their interaction partner (Agent). In our modification, investment failure can also be caused by external factors.¹⁰ Each round the possibility exists that the investment is destroyed in a random shock. This design feature allows us to reflect the reality that personal insolvency can be due to external causes and/or a conscious non-compliance decision.

In our experiment, both players receive an endowment of \$10. The first player, the Investor, has to decide whether she¹¹ wants to invest and thus sends a part of her endowment (\$4 out of her \$10)¹² to the Agent.¹³ If the Investor decides to interact the amount is multiplied by 4. A random draw then determines, with probability p , whether the multiplied investment reaches the Agent or is destroyed by a random shock.

If the investment reaches the Agent, the game continues as in the standard version and the Agent can decide to split the surplus or to keep the entire amount for himself. If the Agent decides to keep the entire amount, he gains a higher payoff than if he had decided to split the surplus with the Investor. This fact resembles the design feature that declaring bankruptcy and defaulting a loan can be a strategic choice. A debtor may divert money and assets in a way that insolvency practitioners or creditors cannot access the assets in the liquidation process. If he manages to do so, he is materially better off than if he would have returned the loan.¹⁴

¹⁰ Engler et al. (2016) also implemented a nature move in the setting of an investment game and investigated whether returns are motivated by guilt-aversion or reciprocity concerns.

¹¹ In the following the female gender is used for descriptions of the first player, the Investor, and the male gender is used to identify actions of the second player, the Agent.

¹² In our experiment, we used dollar amounts and not experimental currency units.

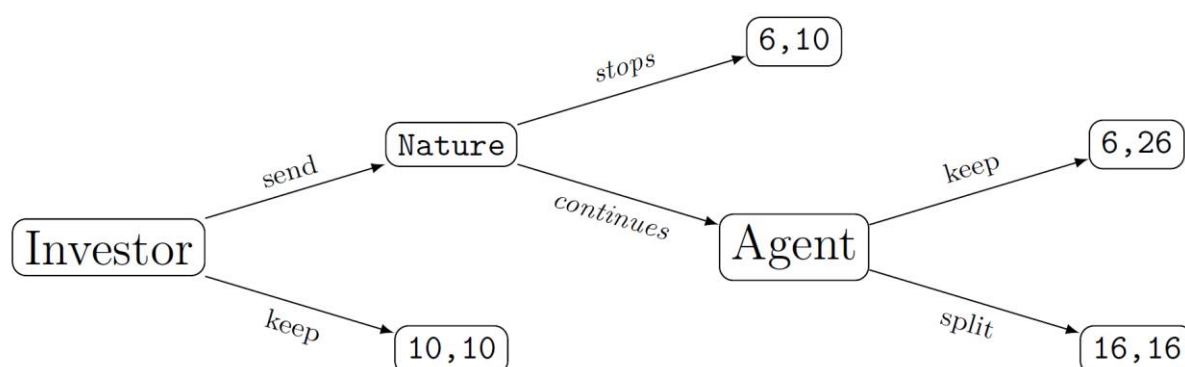
¹³ Contrary to Berg, Dickhaut and McCabe (1996), we chose equal payoffs for the initial situation (Investor chooses keep) to avoid that investments are made due to inequality aversion (Fehr and Schmidt 1999).

¹⁴ Note, however, that most jurisdictions have processes through which transactions made prior to insolvency in order to defeat creditors can be challenged.

If, however, the random draw determines that the investment is destroyed, the Investor ends up with a smaller amount and the Agent earns the same amount than he would if the Investor had kept the amount for herself in the first place. This case resembles the possibility that also external factors can cause that the debtor is unable to pay back the loan. The Investor, on the other side, only learns her final payoffs and importantly, she cannot infer from a low payoff whether the missed return is due to uncooperative motives of the Agent (a decision to keep the funds) or due to external factors.

Figure 2 illustrates the decision tree of our experiment (The numbers on the first position in the boxes correspond to the potential payoff of the first player, the Investor. Numbers on the second position correspond to the potential payoff of the second player, the Agent.).

Figure 2: Modification of the Berg, Dickhaut and McCabe (1995) study



Business Scenario 1 (The decisions of the Investor and Agent in a real world situation): After a bank decides to lend to a sole trader entrepreneur to establish a business, the trader's effort but also market conditions determine the rate of return on the investment. If market conditions are favorable the entrepreneur can decide either to repay the bank's loan or to "keep" the funds. If the entrepreneur decides to repay the funds in part, both parties have a positive return. If, however, the entrepreneur decides to keep the funds, by defaulting on the loan, the entrepreneur has a greater return on investment than the Investor (subject to that default ultimately leading to bankruptcy and the associated loss of assets). If, however, the random draw determines that the business fails through no decision of the

entrepreneur (e.g. a major customer of the business falters and business fails), both parties end up with lower payoffs.

For our treatment variation, the RECORDS group, procedures are identical to the control group, except that the Agent's history of returns (including any missed returns) is revealed to the Investor. Before the Investor needs to decide whether to send money or not, she learns how often the Agent failed to return funds in the past. This information is given in the form of a table, in which rounds with missed returns are colored in blue. Making the Agent's history of play visible allows us to test for two potential impacts of public records. First, how is the investment decision of the first player (the Investor) affected by this extra information and second, does the Agent change his behaviour when records about his past are made public?

Business Scenario 2: In this scenario, the bank obtains information about the entrepreneur's previous financial history, specifically whether the entrepreneur has or has not been bankrupt in the past. This information is provided to the bank before the bank makes a decision on whether or not to invest in the business.

To shed light on how market conditions may influence the impact of public records we conducted all treatment groups with a high and low stopping probability. By varying this probability, we simulate favourable and more difficult market conditions, under which Agents are more likely to fail paying back the investment due to a random shock. These scenarios reflect the situation in which Agents become bankrupt because of external factors. Under favourable market conditions, subjects were told that the chance of investment failure was $1/6$ ($p = 16.7\%$), whereby under difficult market conditions subjects were told that the chance of failure was $1/3$ ($p = 33\%$).

Participants played eight repetitions of the game. While they remained in their designated roles (Player 1: Investor or Player 2: Agent), they interacted each round with a new player in the other role (stranger matching). The experiment was conducted in neutral framing, this means all relevant decision characteristics were described in abstract terms, without a reference to bankruptcy or business activities. The instructions can be found in the Appendix. Table 1 illustrates the variations and shows the

distribution of observations over the treatments. Half of the participants in each treatment group were Investors and the other half played in the role of the Agent.

Table 1: Treatments

Treatment	Market conditions	Observations	
CONTROL	<i>Difficult MC*</i>	68	36
	<i>Favourable MC</i>		32
RECORDS	<i>Difficult MC</i>	70	36
	<i>Favourable MC</i>		34

*MC=Market Conditions

We conducted the experiment in November 2015 with students of the Queensland University of Technology. Participants were students from various disciplines, however, law and economics majors constituted the largest proportion. Over the eight sessions, one-hundred and thirty-eight individuals participated in this study. The experiment lasted on average for 40 minutes and at the end of each session payments were handed out by a person who was not involved in the experiment. On average participants earned AUD 11, the Australian minimum wage in November 2015 was AUD 17.29 per hour (Fair Work Commission, *National Minimum Wage Order 2015*).¹⁵ We recruited participants with the help of the software ORSEE (Greiner 2015) and used CORAL (Schaffner 2015) as experimental software.

¹⁵ The National Minimum Wage Order is available at https://www.fwc.gov.au/documents/sites/wagereview2015/decisions/c20151_order.pdf (last accessed 19 June 2017).

V. HYPOTHESES

A. STANDARD THEORETICAL PREDICTIONS

Behavioural predictions based on standard theory serve as a useful benchmark against which we can contrast the observed behaviour in our experiment. Hence, we first derive the behavioural predictions based on standard game theory, i.e. assuming rational choice. Given the game has a subgame structure, all past payoff relevant decisions are known whenever a decision-maker has to act.

Hypothesis 0 (standard): *Inefficiently, the Agent will always choose keep, and for that reason, a rational Investor will not send money to the Agent (invest).*

This hypothesis follows from observing that the Agent can gain a higher payoff from choosing ‘keep’ given that the Investor’s decision is locked in at this point in time ($26 > 16$). Knowing this, the Investor is always better off choosing ‘keep’ in the first place ($10 > 6$). This outcome is however inefficient since expected payoffs from cooperation are for both players greater than 10, even when the loss through an adverse random (nature) event is considered.¹⁶

B. EXTENDED STANDARD PREDICTIONS: TWO TYPES

In a next step, we allow for the existence of social preferences and proceed with a rational choice prediction with two types of Agents. Agents of Type 1 are decision-makers, who are only interested in maximizing their financial gains. We call these individuals ‘*self-oriented Agents*’. Agents of Type 2 are, on the other hand, also motivated by social concerns. We assume these agents experience disutility when they are not meeting the expectations of others, or respectively do not repay the trust granted in them through investment (reciprocity concerns) (Fehr and Gächter 2000, Cox 2004). Hence, these Agents propagate financial means under the prerequisite of meeting the social norm of exchange and we call them ‘*reciprocal Agents*’.

¹⁶ When both players commit not to play ‘keep’ expected payoffs for the Investor and Agent are 15 and 23.33 if $p = 1/6$ and 14 and 20.66 if $p = 1/3$.

On the other side stand the rational Investors, who choose only ‘send’ when a return of at least of the size the investment or larger can be expected. Two factors are shaping this expectation. First the market conditions, i.e. how likely does the Investor perceive the possibility that external conditions will cause an investment failure. And second the type of their interaction partner, i.e. how likely does the Investor assess the likelihood that she faces a ‘*reciprocal Agent*’ who will reciprocate her trust and split the surplus.¹⁷

Introducing a history of play to this model world does not change the standard (subgame perfect) prediction about the players’ behaviour, but it affects the beliefs of the Investor. With the records on past missed returns, the Investor gains additional information about what type of Agent she faces and will decide subsequently whether it is worthwhile to invest.

Being aware of the impact the history has on the Investor’s interaction decision, ‘*self-oriented Agents*’ also have now an interest in keeping their records clean. It follows that now also ‘*self-oriented Agents*’ choose ‘split’ to secure future investments, particularly in early rounds of the game.

Hypothesis 1 (existence of records): *Introducing a public record system about an Agent’s past return behaviour increases the probability that an Agent chooses ‘split’ and consequently Investors are more frequently willing to choose ‘send’.*

But, based on the mixed evidence found in previous studies probing for the effect of a history of play, we expect a strong reliance of the history effect on the content of the history. We expect investment decisions to differ largely when an Investor faces a ‘clean’ history than when the history indicates past incidents of missed returns.

¹⁷ One can calculate the values for π such that the Investor receives the same expected payoff from ‘send’ and ‘keep’, given the probability π an Agent chooses ‘split’, i.e. the probability that the Agent is of the ‘reciprocal Agent’ type. This results in the Investor choosing ‘send’ if she believes the Agent will choose split with at least a probability of $\pi=0.72$ in the favourable market condition, and with at least probability $\pi=0.9$ in the difficult market condition.

Hypothesis 2 (content of records): *When the Investor sees in the records that an Agent had episodes in the past in which payments were not returned, her expectations about the Agent choosing ‘split’ are lessened and she (the Investor) is less likely to choose ‘send’.*

This potentially leads an Agent with a poor history of returns to choose ‘split’ more frequently, since he wants to make up for the unfavourable records from the past.

Lastly, rational players in role of the Investor as well as in the role of the Agent should give less importance to the records under difficult market conditions than in settings with favourable market conditions. Missed returns can be either be caused by an uncooperative decision of the agent or due to external shocks, which are more likely under difficult market conditions. Hence, the records provide a less accurate information about the type of the Agent in the setting of difficult market conditions.

C. BEHAVIOURAL BIASES PREDICTIONS

A wide strand of research in behavioural economics and psychology has shown that individuals are not the rational decision-makers rational choice theory predicts. Often people apply simple heuristics when making decisions and are prone to certain biases. In the following, we account for biases, which we see as an important source of potential deviations from rational choice predictions in our setting.

People, for example, tend to overreact to (recent) negative feedback (Kahneman and Tversky 1979; Rozin and Royzman 2001). In our setting, this means that an Investor, who has experienced a failure of returns, is in future rounds reluctant to invest, although she is no longer dealing with the same Agent. This negativity bias applies to one’s own experience, but also to information or perception an Investor has lately gained. Hence, Investors are additionally expected to overweight cases of investment failure in the history of an Agent. This leads to two further predictions:

Hypothesis 3 (own experience bias): *If an Investor chose ‘send’ in the last period and did not receive a payment back, she is, independent of the Agent’s records, less likely to choose ‘send’ in the current period.*

Hypothesis 4 (belief bias): *An Investor is less likely to choose 'send' if the Agent's records show a recent incident of missed returns.*

The same predictions can also be derived based on recency bias and loss aversion. According to the recency bias, evidence from the recent past, or in our case the last round, is relatively overweighted in the decision-making process (McKenzie, Lee and Chen 2002). And according to Kahnemann and Tversky's loss aversion theory (1979), experiencing a (recent) loss leads to overly cautious behaviour.

VI. RESULTS

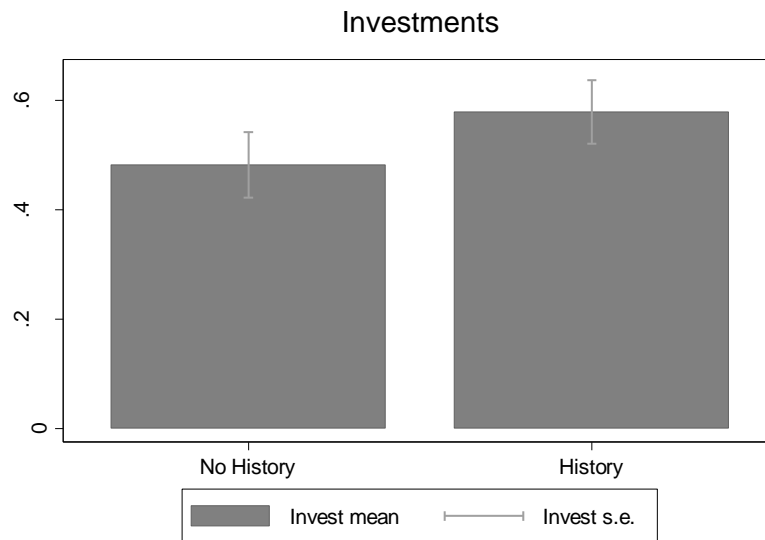
We assume the effect of public records about past behaviour is twofold. First, the exposure might affect the return behaviour of the Agent, whose past behaviour is now visible. Second, this information about the Agent's history will also influence the willingness of an Investor to interact with the Agent. In the following, we analyse the latter effect first, before we investigate how public records affect the Agent's own behaviour.

A. INVESTMENT BEHAVIOUR

Before starting with the analysis of the Investors' behaviour it is relevant to note that no significant difference is found in investment behaviour between the varying (favourable or difficult) market conditions, neither in the control nor in the treatment group (Fisher's exact test (two-sided) between the two conditions in CONTROL: $p=0.904$, in RECORDS: $p=0.904$). This finding indicates that participants did not rationally calculate the expected payoffs from their investment and made their investment decision accordingly. For the further analysis, we therefore pool the data for each group over the two market conditions.

When comparing investment rates between the CONTROL and RECORDS group, a strong significant difference becomes apparent. When the history of play is made publicly available the average investment rate is 20 percentage points higher than without public records (Fisher's exact test (one-sided): $p=0.014$). In the CONTROL group, investments came about in 48 % of the cases, whereas in the RECORDS group, when public records were available, interactions and consequently investments were realized in 58% of the cases. This implies that we can also reject the predictions based on standard theory that investments are zero.

Figure 3: Investments



Investor Result 1: *Investors invest significantly more often than predicted by rational choice theory (Hypotheses 0 is rejected.)*

Investor Result 2: *When records about the Agent's history of play are available, the investment rate is significantly higher than in a setting without information on past play. (We find support for the prediction of the Investor behaviour in Hypothesis 1.)*

To gain better insights into the impact of the records on investment behaviour we consider the kind of information Investors receive with the respective records. Following Hypothesis 2 (content of records), we expect Investors to react differently to a clean history than to a history which reveals that the Agent has failed to return payments in the past. A simple comparison of investment rates in these settings confirms what one expects. When an Investor learns that the Agent did not return money in the last round, the likelihood for an investment is 19 percentage points lower (Investment ratio when last round is

‘clean’: 63.18% vs. when last round is coloured¹⁸ 44.30% - Fisher’s exact test (one-sided) $p=0.003$). In a regression analysis, we investigate the impact of the varying records’ content in more detail. Table 2 presents the average marginal effects from probit regressions estimating the likelihood of an investment.

Model (1) confirms the previous results, the exposure of information about the Agent’s history of play leads to an increase in investment of about 10%. The regression analysis is more demanding since we also account for the heterogeneity between subjects by clustering the standard errors on an individual level. The effect is here weaker and no longer statistically significant ($p=0.17$).

Model (2) accounts for the fact that the information about the Agent’s past behaviour can differ. While records generally lead to a positive effect in investments, the investment likelihood significantly drops when the records reveal that the Agent failed to return payments in the previous round. This negative effect is of such strength that it overrides the general positive effect of public records. Hence, an Agent who failed to pay in the previous round is stigmatized for future business activity and Investors are less likely to entrust money to this Agent. But this effect is not comprehensive. Even if records show a missed return in the past, some Investors are still willing to interact and investments are made in about 44 % of the cases.

Investor Result 3: *When the records reveal that an Agent failed to return payments in the previous round, Investors are significantly less likely to invest than when no records would have been available. (We find support for Hypothesis 4.)*

Model (3) considers the number of rounds shown in the records in which the Agent failed to pay back. As expected, the more often returns were missed by the Agent, the less likely the Investor is to decide to interact. In the final model (Model (4)), the market conditions the subjects were playing under and individual characteristics such as gender, experience with economic experiments and study majors are added as control variables. The results remain robust.

¹⁸ Rounds in which payments were not returned in the Agent’s history of play, because the nature move determined that the investment got lost or the Agent decided not to split, were coloured in blue. The Appendix provides exemplary the instructions from RECORDS ($p=2/6$), in which the used table is also displayed.

An Investor's own experience of a missed return, on the other hand, has only a non-significant negative effect on the willingness to invest in the current round.

Investor Result 4: *When the Investor has experienced a missed return in the previous round, it does not impact her following investment decision in a statistically significant manner. (We do not find support for Hypothesis 3.)*

Table 2: Investment behaviour

	Likelihood of Investment			
	(1)	(2)	(3)	(4)
Records	0.097 (0.071)	0.152** (0.076)	0.182** (0.089)	0.206** (0.0986)
Last_blue		-0.191*** (0.074)		-0.127* (0.0757)
Last_noreturn				-0.0146 (0.0619)
Past_blue			-0.069* (0.042)	-0.0435 (0.0438)
Round			-0.040*** (0.012)	-0.0429*** (0.0117)
Difficult MC				0.0116 (0.0772)
Observations	552	552	552	552
Ind. characteristics	No	No	No	Yes

Note: This table presents the average marginal effects (calculated at the means of all variables) from probit regressions on the likelihood of investments. 'Records' is a dummy variable for the treatment. 'Last_blue' is an additional treatment dummy taking one when the Investor sees in the records that the Agent missed to return money in the last round. 'Last_noreturn' turns one when the Investor herself experienced a missed return in the last round. The variable 'Past_blue' accounts for the amount of past rounds the Investor sees the Agent has missed to return payments. 'Difficult MC' captures whether the subjects played in a regime with a high stopping probability (difficult market conditions). Model (4) includes individual characteristics (gender, economics or business major and experience with economic experiments). The standard error, clustered on an individual level, are written in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

To summarise the findings on the Investor behaviour, we can say that providing public records generally facilitates investments. However, if the records reveal that the Agent failed to return payments in the past, it hinders cooperation in consequent investments, particularly when the payment failure has taken place

in the previous year. Under such conditions the effect of negative stigmatization on the Agent outweighs the general positive effect of public records

B. AGENT BEHAVIOUR

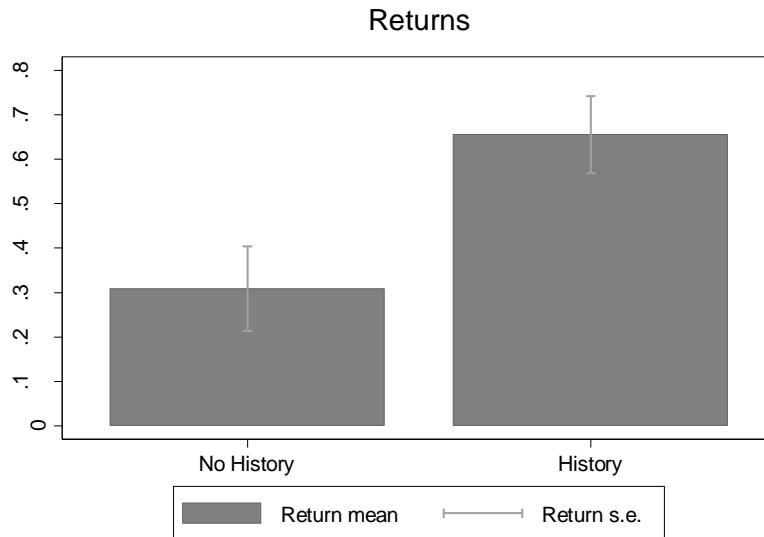
We assumed the effect of public records is twofold. In the last section, we analysed how public records affect the investment decision of potential Investors and how this effect consequently impacts the business opportunities of actors. In this section, we investigate how the knowledge that a potential Investor has information about one's own past influences the compliance and return behaviour of the Agent. The analysis is structured in the same manner as before. However, observations are significantly lower in this second part, since the choice of the first player (Investor) and the nature move¹⁹ determine a priori whether the Agent is able to make a decision. Overall, Investors chose to interact in 53.08% of the cases (CONTROL + RECORDS group). And out of these remaining 293 observations, nature determined in 80 cases that the game stopped. Hence, 213 observations are left for further analysis (97 observations in CONTROL and 119 observations in RECORDS).

Before investigating the effect of the records on the return behaviour, we first compare the behaviour between the two market conditions. Also, here, the differing market conditions (stopping probability 16% vs. 33%) did not lead to a significant difference in the (return) behaviour, neither in the control nor in the treatment group (Fisher's exact test (two-sided) between the two conditions in CONTROL: $p=0.653$, in RECORDS: $p=0.848$). Hence, we again pool the data.

Comparing the return rates between the two groups, makes obvious that the existence of a public record affects the return behaviour significantly. An Agent is 34 percentage points more likely to return an investment when public records are available. The return rate in CONTROL is 30.9%; in RECORDS, in contrast, an Agent returns money in 65% of the cases (Fisher's exact test (two-sided), $p<0.001$). This implies that we can also reject the predictions based on standard theory Agents always choose 'keep'. Figure 4 shows the aggregated average return rates in the CONTROL and RECORDS group.

¹⁹ The term 'nature move' is here used to describe the fact that a stopping probability exists which determines whether an interaction continues.

Figure 4: Returns



Agent Result 1: *Agents choose ‘split’ significantly more often than predicted by rational choice theory. (Hypothesis 0 is rejected).*

Agent Result 2: *The probability of returns is significantly higher when records about one’s history of play are available than in a setting without information. (We find support for the prediction of the Agent behaviour in Hypothesis 1.)*

We further investigate the return ratio of the individual Agents, meaning the proportion of rounds an Agent chose to return payments when he had the chance to do so, i.e. the Investor chose ‘send’ and the nature move did not stop the game. We find evidence for different types of Agents. From the 34 individuals in the CONTROL group,²⁰ 32% chose to never return money (*self-oriented Agents*), and 15% chose to always return the payments whenever they had the chance to do so (*reciprocal Agents*). Accordingly, 53% of the participants in the role of the Agent used a mixed strategy.

²⁰ The nature move and the decisions of the first players determined that four individuals had in none of the eight rounds the chance to make a decision. We hence hold 213 observations of 65 individuals.

In the RECORDS treatment group, the distribution of types changed significantly. Only 23% of the individuals never returned payments and can be classified as *self-oriented Agents*, 34% always send money back if they had the chance to do so and count as *reciprocal Agents*. Forty-three per cent of the players used a mixed strategy. We hence see that a greater percentage of individuals acted in a reciprocal manner when records were available.

Higher returns under the records schemes can be based on two behavioural motives. First, the Agent wants to reward the investment decision of the Investor, this is what we classify as reciprocity. If reciprocal concerns are driving the return behaviour we should see higher return rates when the return of investments is more uncertain, as for example under the difficult market conditions or when an Agent's history reveals many cases of failed returns in the past. The second motive of an Agent to return money is based more in self-interest. The Agent is motivated to keep his history clean since then future investments from other Investors are also more likely. Our data supports this second motive. The likelihood of returning payments is 37 percentage points higher when the Agent's history of play is 'clean' than when the record from the previous round is coloured (74% return likelihood with a 'clean' last round vs. 37% with a coloured last record: Fisher's exact test (one-sided): $p=0.001$).

A comparison of the same setting in the Control group is interesting. Here the return rate in the present round is not statistically different when an Agent returned or failed to make the payments in the previous round (Return ratio when return was missed in last round: 27% vs. 33% when return was performed in the last round; Fisher's exact test (two-sided): $p=0.636$). This difference suggests that the availability of records motivates the Agent to keep his history clean and this motivation promotes returns.

Agent Result 3: *Agents are motivated to keep their history clean to secure future investments and are therefore significantly more likely to return payments when past actions are made public. Records indicating that the Agent failed to return the payments in the last round impair the positive effect. The return likelihood, however, is still higher in these cases than in a setting when no information is available. (We find support for Hypothesis 2.)*

In a next step, we take into account that coloured records are not necessarily self-inflicted, but can also be the outcome of an unfortunate external shock. With the help of a regression analysis, we elaborate more on this. Table 5 presents the average marginal effects of probit regressions on the likelihood of returns. Model 1 to 3 resemble earlier derived findings, but taking the heterogeneities between subjects into account. Returns are 36% significantly more likely when public records are available (Model 1). When the history on past interactions is ‘clean’, the positive effect on the returning behaviour is strongest. A record revealing a missed return in the last round impairs on the contrary the motive to return payments significantly (Model 2). This decreasing effect of earlier failures is significant in the RECORDS group when a history of play is publicly available, but not in the CONTROL group (Model 3). We therefore conclude the lower return rate is due to the visibility of the failure and not the result of resignation. In summary, however, it needs to be highlighted that even in the case of a coloured record (indicating that return in the last round was absent), the net effect of records on return behaviour is still positive.

In Model 4, we account for the fact that missed past returns can be due to the Agent’s own decision or the outcome of an external shock and that the public record about this failure may affect the Agent in different ways. The coefficient of ‘Last_blue_bynature’ identifies the additional effect of a coloured record when the failure was not self-inflicted. The net effect of such a record on the return behaviour is positive.²¹ When, however, the missed return in the last period is the result of the Agent’s conscious decision the impact of a coloured past record is negative.²² Since the difference between these two cases is highly significant ($H_0: \text{‘Records’} + \text{‘Last_blue’} = \text{‘Records’} + \text{‘Last_blue’} + \text{‘Last_blue_bynature’}$, $p=0.0204$), we conclude that a record of past failure decreases the motivation in the present round to return payments, when the failure was self-inflicted, but strengthens the likelihood of a return when the past missed return was caused by an external factor.

The coefficients for ‘Last_mreturn’ and ‘Last_mreturn_bynature’ describe the counter effect of a missed return for the CONTROL group, where no information on past actions is publicly available. Here such an incident has a negative effect, independent of whether the failure was self-inflicted or not. No

²¹ Following the summation of the coefficients ‘Records’, ‘Last_blue’ and ‘Last_blue_bynature’.

²² Based on the sum of the coefficients ‘Records’ and ‘Last_blue’.

significant effect exists between these two cases ($H_0: \text{'Last_mreturn'} = \text{'Last_mreturn'} + \text{'Last_mreturn_bynature'}$, $p=0.2656$). However, particularly when the past failure is caused by a random shock the negative effect is stronger and this builds a significant contrast to what we observed in the RECORDS group, when public records are available. We conclude that the effect of records about a past return differs, depending on whether the failure is attributed to an internal or external cause. And in the case of an external cause having a public records scheme motivates the Agent to return the payments in the current round, so that we observe a significant positive effect on the return behaviour ($H_0: \text{'Records'} + \text{'Last_blue'} + \text{'Last_blue_bynature'} = \text{'Last_mreturn'} + \text{'Last_mreturn_bynature'}$, $p=0.0516$). These findings remain robust when the market conditions, the round of the game and the individual characteristics are considered in the estimation (Model 5).

One interpretation of this finding is that when a negative record is not self-inflicted, the Agent wants to make sure he proves in the present round that he is not of this *self-oriented Agent* type. Another interpretation is along the reciprocity argument. When an Investor trusts an Agent under the presence of a failed payment in the last round, the Agent wants to make even more sure to live up to this trust.

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Table 3: Return behaviour

Likelihood of Return					
	(1)	(2)	(3)	(4)	(5)
Records	0.359*** (0.092)	0.455*** (0.089)	0.433*** (0.103)	0.455*** (0.089)	0.429*** (0.109)
Last_blue		-0.388*** (0.119)	-0.317* (0.176)	-0.663*** (0.164)	-0.685*** (0.156)
Last_blue_bynature				0.479** (0.206)	0.483** (0.204)
Last_mreturn			-0.071 (0.130)	-0.011 (0.130)	-0.016 (0.130)
Last_mreturn_bynature				-0.270 (0.243)	-0.294 (0.249)
Round					-0.020 (0.015)
Difficult MC					0.062 (0.093)
Observations	213	213	213	213	213
Ind. characteristics	No	No	No	No	Yes

Note: This table presents the average marginal effects (estimated at the means of all values) from probit regressions on the likelihood of returns. 'Records' is a dummy variable for the treatment, 'Last_blue' is also a dummy, turning one, when the Agent missed to return money in the last round and the Investor respectively can see this failure in the records. Last_mreturn is a control variable for missed past return in the control group (not visible). The interaction of both variables with the 'bynature' move indicates that these failures were due to an external nature shock and not of one's own making 'Difficult MC' captures whether the subjects played in the respective round in a regime with a high stopping probability (difficult market conditions). Model (5) includes individual characteristics (gender, economics or business major and how often a subject has participated in economic experiments previously). The standard error, clustered on individual level, are written in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In a separate model, presented in Table 4 in the Appendix, we examine the effect of a public history of play not only based on the content of the last round record, but overall. We find a negative linear relationship between the number of missed returns in the past and the likelihood to return the payments in the current round. The negative effect is hereby significantly stronger when no public records are available ($p=0.0194$).²³ The mitigation of the negative effect under the records scheme is explained by the fact that Agents are motivated to return the payments when the records show a past failure which was caused by external factors.

²³Please see Table 4 in Appendix, on Model 2 H0: 'Return_past_mback' = 'Return_pastblue'.

Agent Result 4: *When public records are available and show a missed return in the past, Agents are more likely to return the payments in the present round when this past failure was caused by external factors.*

In summary, public records have a positive effect also on the Agents' return behaviour. Agents are motivated to keep their history of play clean to secure future investments. And even when the records reveal a past failure, returns are still higher than in the control scheme when no information about the past is available for the Investor. Particularly when the past failure shown in the records is caused by external factors, Agents are highly likely to return payments in the next round.

VII. CONCLUSIONS AND IMPLICATIONS

In this study, we employed the method of economic experiments to inform discussions about the impact that availability of personal insolvency records may have on investment and business decisions. Our interest was derived from differences in national legal schemes, which differ in the duration of public records of an individual's bankruptcy after an individual is discharged from bankruptcy. We are also responding to the call for more consideration of discrimination issues in bankruptcy, in the context where the availability of personal insolvency records can facilitate such discrimination.

By using a controlled experiment as an investigation method, we could identify causalities of changes in individual behaviour. We have shown that the exposure of previous non-returns influences the Investor's willingness to interact as well as the Agent's own behaviour. By adding an element of uncertainty, we have allowed for the possibility that investments were lost due to external factors; that there can be non-payment without there being an element of fault in the Agent. We found a general positive effect of the availability of information on past payments, with investments increasing and returns being more frequent in the RECORDS group than in the CONTROL group. However, this was only the case when the records were clean, that is, where the Agent had not had any missed payments. As soon as a case of previous non-payment was visible in the records, investments dropped significantly and only a smaller proportion of investors were willing to invest.

On the Agent side, the impact of a public record indicating a missed return in the past was mixed. When the past failure was caused by the Agent's conduct (a deliberate decision not to return), the Agent is less likely to return than when the information was not publicly available. When, however, the past failure was due to external factors, Agents were significantly more likely to return the payments than in the same case in the CONTROL group, when the history of play was not made public. This means a mismatch exists. Investors are not able to distinguish in the records between self-inflicted failures and payment failures caused by factors outside the Agent's control and are therefore less likely to invest when public records show a past failure. Agents, on the other hand, are highly motivated to return payments when records reveal a past failure, but only where this failure was not self-inflicted.

Applying these findings to the personal insolvency situation confirms our expectation of dramatic negative effects of stigmatization after a personal insolvency event. Our findings suggest that, after insolvency, Agents (debtors) struggle to gain back the trust of Investors and, perhaps in anticipation of this stigmatization, also reduce their incidence of repayment. Our findings suggest that public records can facilitate investments, but this benefits only business partners with a clean history. Such a result suggests that an insolvency system that has a fresh start goal may not be able to realize that goal if public records of the insolvency are available.

We caution that our study is an initial study only, and, as discussed above, has some limitations in scale and scope. For example, our study involved university students in a laboratory setting, and did not account for the transactions costs of accessing public record information or any restrictions on repeat access to personal insolvency administrations. Further work is required to confirm our findings and explore these issues further. In this light, however, our study has highlighted the potential for future application of behavioural experimental research to policy questions in personal insolvency. As well as expanding our research with a greater number of observations, it would be interesting to see what happens when records not made available after a set period, thus making only the most recent behaviour known to the Investor. Further, it would be worthwhile considering the impact of availability of records in other (non-business) contexts.

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APPENDIX

RETURN BEHAVIOUR

Table 3: Likelihood of Returns, considering the entire content of the records

	Likelihood of Returns	
	(1)	(2)
Past_blue	-0.277*** (0.052)	-0.280*** (0.051)
Past_mback	-0.143*** (0.055)	-0.158*** (0.051)
Round	0.046** (0.022)	0.048** (0.022)
Difficult MC		0.081 (0.087)
Observations	213	213
Ind. characteristics	No	Yes

Note: This table presents the average marginal effects (estimated at the means of all values) from probit regressions on the likelihood of returns. The variable 'Past_blue' and 'Past_mback' accounts for the amount of past rounds the Agent failed to return the payments. 'Round' captures the round the subjects is playing in. 'Difficult MC' captures whether the subjects played in the respective round in a regime with a high stopping probability (difficult market conditions). Model (5) includes individual characteristics (gender, economics or business major and how often a subject has participated in economic experiments previously). The standard error, clustered on individual level, are written in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

INSTRUCTIONS

General Instructions

General Remarks

Thank you for participating in this experiment on decision-making. During the experiment you and the other participants are asked to make a series of decisions.

Please do not communicate with other participants. If you have any questions after we finish reading the instructions please raise your hand and an experimenter will approach you to answer your question in private.

Two Roles

There are two roles in this experiment: **Player 1** and **Player 2**. At the start of the experiment you will be assigned to one of these two roles through a random procedure. Your role will then remain the same throughout the experiment. Your role will only be known to you.

Earnings

You will receive money based on your decisions, the outcomes of random moves and the decisions of other participants. All payments will be made confidentially and in cash at the end of the experiment.

Privacy

This experiment is designed such that nobody, including the experimenters and the other participants, will be able to link your decisions in the experiment to your identity. Neither your name nor your student ID will appear on any decision form. The only identifying label on the decision forms will be a number that is only known to you. At the end of the experiment, you are asked to collect your earnings in an envelope one-by-one from a person who has no involvement in and no information about the experiment.

Decisions Per Period

The experiment is divided into **16 periods**. You are asked to choose your preferred option in each of these periods. Only one period will be randomly selected for cash payments; thus you should decide which option you prefer in the given period **independently** of the choices you make in the other periods.

There are two roles in the experiment: Player 1 and Player 2.

After each round, Player 1 is randomly matched with a different Player 2. No one will ever be informed about the identity of the participant he or she was paired with. Both players receive an endowment of \$10 in each period.

The first move is made by **Player 1**. He is asked to choose whether he wants to send \$4 of his endowment to Player 2.

If Player 1 decides to transfer \$4 to Player 2, his transfer will be multiplied while being sent. It is then randomly determined whether the round is stopped at this point of time or if Player 2 has the opportunity to send money back to Player 1.

Only Player 2 learns about the outcome of this random draw, i.e. whether the round has been stopped or not.

- The round continues with a $\frac{4}{6}$ **chance** ($\sim 67\%$).
In this case, Player 2 can decide whether to keep the surplus or split it with Player 1.

OR

- The round stops, this happens with a $\frac{2}{6}$ **chance** ($\sim 33\%$). (*Think of a roll of a dice; the round stops when the dice shows 1.*)
In this case, Player 2 cannot send money back to Player 1.
Player 1 receives then the \$6 left from his or her initial endowment and Player 2 receives the initial endowment (\$10).

If in the first place Player 1 decides not to transfer the \$4 to Player 2, nothing happens and both players receive their initial endowment of \$10.

Decision Task Player 1

If you are assigned the role of Player 1, you are asked to decide – in each period – whether or not to transfer \$4 to Player 2.

Before Player 1 needs to make the decision whether to send the \$4 to Player 2 or not, a table as the one below will be displayed.

In this table the past periods in which the Player 1 received a transfer, but did not return money, are colored in blue.

History of Play

Round		Round		Round		Round	
1		5		9		13	
2		6		10		14	
3		7		11		15	---
4		8		12		16	---

(Rounds which have not been played yet are marked with ---.)

Decision Task Player 2

If you are assigned the role of Player 2, you are asked to decide whether you want to keep the surplus or split it with Player 1.

If you decide to split the surplus, you and Player 1 receive \$16 for this round.

If you decide to keep the surplus you receive \$26 for this round and Player 1 \$6.

Payoff

At the end of each round, each player learns his or her potential earning from this round.

The table below summarizes the potential payoffs for Player 1 and Player 2 depending on their respective choices.

Choice Player 1	Random Draw	Choice Player 2	Payoff Player 1	Payoff Player 2
no transfer	-	-	\$10	\$10
transfer	game continues	split	\$16	\$16
		keep	\$6	\$26
	game stops	-	\$6	\$10

Experimental Earnings

At the end of the experiment, only one of the periods will be chosen randomly to calculate the cash payments. The exact payments are determined according to the choices that were made during the game.