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Risky data: The combined effect of framing, trust and risk preferences on the intended participation in the Consumer Data Right

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Abstract

The Consumer Data Right (CDR), which began in Australian on the 1st of July 2019, aims to give Australian customers a right to access data about them held by businesses, and also to share this information with accredited and trusted third parties of their choice. This enhanced flow of information in the economy is designed to benefit consumers by improving their ability to compare and switch between products and services. The policy also aims to increase the effectiveness of relevant markets. In this paper we examine the effects of framing and behavioural preferences on the willingness to use the CDR. This analysis was conducted in two steps. First, we examine the pure effects of loss and gain framing on the willingness to use the CDR. In the second step, we examine the joint effects of framing and trust/behavioural preferences on the decision to use the CDR. We find significant effects for both positive and negative framing (compared to neutral framing) with the effects varying based on the person's level of trust in government and risk preference. We conclude with implications for this particular policy initiative, as well as with other policy initiatives that involve significant risk of data privacy breaches.

JEL Codes: G28, D91, C91, D81
Keywords: Consumer Data Right, survey experiment, trust in government, risk preference, framing

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1 Introduction and overview

The Consumer Data Right (CDR) aims to give Australian customers a right to access data about them held by businesses, and also to share this information with accredited and trusted third parties of their choice. It follows directly from a set of recommendations made by the Productivity Commission in their Data Availability and Use Report[1], released in May 2017, as well as the "Review into Open Banking in Australia" report chaired by Mr. Scott Farrell.[2] These two reviews have drawn on the experience of the Open Banking initiative in the UK.[3]

The first stage of the CDR commenced on the 1st of July 2019 "with all major banks making data available on credit and debit card, deposit and transaction accounts by 1 July 2019 and mortgages by 1 February 2020." This will be followed by the energy and telecommunications sectors.

The premise of the legislation is that the enhanced flow of information in the economy will benefit consumers' by improving their ability to compare and switch between products and services. Moreover, the CDR will also encourage competition between producers which will, in turn, lead to better prices, greater variety of products, higher product quality and greater innovation (Shapiro 2011). It is intended, therefore, that the CDR will support data-driven economic growth which will benefit both consumers and producers in Australia.

Endowing people with rights does not always translate to them taking advantage of those rights. Standard economic models would suggest that more information improves decision making. However, individuals need to be aware that information exists, have the cognitive capacity and bandwidth to make use of that information, and trust that the information is accurate. Furthermore, in the case of the CDR where the information that is being used is about the customer themselves, there needs to be sufficient trust that extracting and sharing that information won't lead to adverse outcomes. One of the potential barriers to the CDR being a success is therefore relatively low take-up.

[1] https://www.pc.gov.au/inquiries/completed/data-access#report
[2] https://treasury.gov.au/review/review-into-open-banking-in-australia
[3] https://www.openbanking.org.uk

For markets to work efficiently, it is not necessary for every consumer to have and make use of full information. However, to create the right incentives for firms to compete, there must be enough people who have access to the information required and to be willing to switch products. Given the potential benefits of the CDR, it is therefore important for there to be a large enough number of people willing to take advantage of the right and to switch products based on the data obtained. With that in mind, the aim of this paper is not to discuss the merits of the CDR or Open Banking, nor to predict whether they have been or will be a success. Rather, it is to analyse the effect of how the CDR is framed on willingness to participate, as well as who may be more or less receptive to certain messages. In other words, we take the policy settings as a given, and focus on the characteristics of consumers and on the communication with consumers that are more likely to predict engagement with the policy.

In summary, we use data from 2,150 individuals who took part in the 27th ANUPoll (October 2018), conducted on the Life in Australia panel. From this data, we analyse responses to a question on willingness to participate in the CDR, and how this varies across a randomly assigned loss, gain or neutral framing of the policy. We look at variation by framing across the sample, as well as whether there is an interaction between framing, trust in government with regards to data and risk preference. We find that framing does have a large effect on willingness to participate, and that those who are most likely to participate are those with high trust in government and high risk aversion. However, there is a significant and large difference in the effect of framing across both risk preference and trust.

The remainder of the paper is structured as follows. In the next section, we introduce and summarise the literature on framing, risk and trust. This is followed by a section on data and methods, with the results presented in Section 4. Section 5 summarises, and provides some concluding comments.

2 Framing, risk and trust

The paper is positioned within the emerging fields of framing, risk and trust. A question of significant importance for a government when promoting a new intervention such as the CDR is how to present the message to potential customers. In modern economics, the expected utility theory suggests that individuals make consistent rational decisions and these decisions

are not influenced by how choices are presented to them (Savage 1954, Von Neumann & Morgenstern 1944). However, a parallel set of literature makes clear that consumers aren't completely rational in their decision making and aren't able to take all information into account in an unbiased way. Nonetheless, deviations from the rational-agent model are somewhat explainable. That is, in the words of Ariely (2008) consumers are predictably irrational.

One classic example of the way in which individuals behave in 'predictably irrational' ways is somewhat different responses to choices presented in terms of gains consumers can acquire from using the product (positive frame) or in terms of losses they would suffer from not using it (negative frame). The pioneering work of Kahneman & Tversky (1979), Tversky & Kahneman (1981) in prospect theory revealed that different wording or "framing" of such formally identical problems can lead to changes in preferences and therefore, lead to different decisions. Tversky and Kahneman (1981) demonstrated the impact of such "frames" using their famous Asian disease problem where they showed that individuals are risk-averse when a choice is presented in terms of gains and risk-seeking when a choice is presented in terms of a loss.

The effects of framing on decision-making have been documented in numerous domains since it was first introduced by Tversky and Kahneman. In consumer behaviour, Ganzach & Karsahi (1995) examined the impact of positive framing and negative framing on credit card owners. The authors found that credit card owners were more responsive to messages that stressed losses from not using it than the messages that stressed the gains from using the service. In another study, Gamliel (2010) found consumer choices were dependent on framing and that different framing techniques resulted in preference reversals. The author also found that the persuasive impact of negative framing was greater than positive framing. This result is consistent with previous findings of framing effects in other contexts, such as financial decision-making (Jaegher 2019, Roszkowski & Snelbecker 1990), promoting healthy behaviour (Kiene et al. 2005), advertisements for mouthwash (Homer & Yoon 1992) and breast self-examination (Meyerowitz & Chaiken 1987).

Even though framing is an important factor affecting an individual's decision making process, several studies have shown that the effect of framing significantly depend on an individual's behavioral traits and the context. Lee et al. (2018) found that the effectiveness of framing was dependent on behavioural traits such as the consumer's regulatory focus. More specifically,

the results of the study indicated that regardless of the product type, positively framed messages were more effective relative to negatively framed messages for promotion-focused consumers. In another study, Druckman & McDermott (2008) found that emotional state of individuals influences the impact of a frame on a risky choice. They concluded that individuals who are more enthusiastic tend to be less affected by framing and individuals with a high level of distress led to greater impacts of frames. A similar conclusion was drawn by Seo et al. (2012). The authors found that the role of affect (pleasant or unpleasant feeling) depressed the effects of frames significantly in a risky choice environment. Trust and risk preferences are two such behavioural traits that may influence the effects of framing and also intention to use the CDR.

Trust can be defined as holding a positive perception regarding the actions of an individual or an organization (Lewicki et al. 1998). Chanley et al. (2000) highlighted the importance of trust by quoting "citizens' trust is necessary for political leaders to make binding decisions, commit resources to attain societal goals and secure citizen compliance without coercion". The importance of trust has also been identified numerous contexts. For example, in economic growth and development (Dasgupta 2009), public administration (Cooper et al. 2008), financial services and sector (Tyler & Stanley 2007, Bossone 1999), marketing (Johns & Perrott 2007) and customer relationship management (Halliburton and Poenaru 2010).

Similarly, citizens' trust is an important factor that influences their decision to use an online service (or an e-government service) such as the CDR. Over the last few years, several studies have highlighted that citizens will be less likely to adopt e-government services if they lack trust in the government and online service providers (Belanger & Carter 2008, Albesher & Brooks 2016, Pavlou 2003, Siau & Shen 2003). The primary reason for this result is the increased fear of identity theft and privacy loss (Myron 2004). In the case of CDR, where there is a perceived and an actual risk of privacy loss and identity theft, we believe that trust in the message source (the Commonwealth Government) and CDR service providers (financial institutions and telecommunication companies) will play a vital role in decision to use the CDR.

In terms of trust and framing effects, a number of studies have investigated the impact of trust on framing effects. Using the conversational pragmatics approach, McKenzie and Sher (2017) concluded that when the individuals doubt the cooperativeness of the speaker (experimenter), the effects of attribute framing is significantly affected. More specifically, in

this study, the authors found that when the choice was presented to the participants by a "knowledgeable" friend, the effects of positive framing increased significantly compared to the choice being presented by advertisers (source with low level of trust). Contrastingly, the effects of negative frames decreased when presented by a "knowledgeable" friend compared to advertisers. A similar conclusion was presented by Kim (2014) in the context of green marketing in the hospitality industry.

In another study, Arora & Arora (2004) explored the impact of message framing and source credibility on the intention and attitude to follow healthy eating guidelines. The authors concluded that credibility of the source has a significant impact on both the attitude and intention to follow a healthy a diet. However, they concluded that effects of framing and the interaction between credibility and framing is insignificant. In the context of political communication research, Kerner et at, (2014) found that the credibility of the source was a prerequisite for successful framing. They highlighted that, a source with high credibility strengthens the effects of framing while less credible source had no effect on framing. This result is consistent with the previous study on credibility and framing (Druckman 2001).

In terms of risk preferences, prospect theory suggests that individuals tend to be more risk averse when a choice is presented using a gain frame, preferring a sure payment than a gamble, but risk-seeking when presented using a negative frame, preferring a risky gamble than a sure loss. This frame dependent risk preference shift was documented in numerous studies in different contexts (Kuhberger 1998). Although the focus of framing research has been on frame dependent risk preference reversal, several researchers have examined the extent to which individual risk taking propensity (willingness to take risks) moderate framing effects (Fagley & Miller 1990, Huangfu 2014, Zickar & Highhouse 1998). In the study conducted by Zickar and Highouse (1998), the authors found that individuals with extreme risk preferences (i.e., high or low) were not susceptible framing effects relative to individuals with moderate risk preferences. This conclusion was consistent with study conducted by Hangfu (2014) and also with the hypothesis posited by Frisch (1993). However, while we expect this conclusion to be the general consensus, the past research on risk preferences and framing have not always reached this result. For example, In the studies conducted by Fagley and Miller (1990) and Elliott & Archibald (1989), the authors found no interaction between an individuals risk preference and the susceptibility to framing.

Given the importance of framing in decision-making, in the present study, we aim to contribute to the existing literature by examining to what extent does framing, trust and risk preference affect the hypothetical willingness to use the CDR. This was achieved in two steps. First, we examined the importance of framing in the context of an online service (CDR) where individuals will deal with risky data. In the second step, we examined the joint effects of trust, risk preferences and framing on the decision to use the CDR. In terms of trust, we examined the extent to which trust in the message source and the service providers dictate the intention to use the CDR and also it's interaction with framing effects. In terms of risk preference, we investigated the extent to which an individual risk preferences affect the decision to use the CDR and also it's interaction with trust and framing.

3 Data and method

3.1 Sample

In order to facilitate the first part of our analysis, that is, to investigate the relationship between framing, trust and the intention to use the CDR, we used data from ANUPoll 27 - the 27th survey in the ANUPoll series. The ANUPoll is conducted for The Australian National University (ANU) by the Social Research Center (SRC). The poll is a quarterly survey involving a national random sample of the adult population using the "Life in Australia" panel.

The survey is conducted both via the Internet and phone to ensure coverage of households without access to the Internet. In ANU Poll 27, 2,150 individuals were interviewed (88% online and 12% by phone) and the interviews took place between 8 and 22 October 2018. Table 1 provides a summary of key statistics of ANUPoll 27.[4]

[4]Source: Social Research Centre (SRC)

Table 1: Summary of Key Statistics - ANUPoll 27

Field	Total	Online panel members	Offline panel members
Invited to complete survey	2,774	2,438	336
Total interviews achieved	2,150	1,895	255
Completion rate	77.5%	77.7%	75.9%
Survey start date	8-Oct-2018	9-Oct-2018	8-Oct-2018
Survey end date	22-Oct-2018	22-Oct-2018	22-Oct-2018

3.2 Survey questions

To capture the interaction between framing and the intention to use the CDR, each participant in the survey was provided with information regarding the CDR that was either positively framed, negatively framed or neutrally framed in a random manner. Out of the 2,150 participants, 1,074 participants (50% of the sample) received the information regarding the CDR in a neutral frame, 538 participants (25% of the sample) received it in a negative frame and 538 participants (25% of the sample) received the information in a positive frame. Moreover, irrespective of the frame that was used, each online participant was presented with a link that provided additional information regarding the CDR.[5]

Following the presentation of this information, participants answered 4 questions regarding the CDR. The order of these four questions was randomised and the answers were recorded on a scale of 1 to 5 with 1 being *"Very unlikely"* and 5 being *"Very likely"*. The information and the questions that were presented to the participants are given below.

- Information presented using a Neutral Frame:
  "The Australian Government is introducing a Consumer Data Right that aims to give people the right to safely access certain data about them held by businesses. The right will allow people to access data about themselves in a readily usable form and will also allow consumers better access to information on the products available to them."

  You can find out more information here: https://treasury.gov.au/consumer-data-right

[5]A very small number of people clicked on the link (2.6% of the sample) with no significant difference between the neutral, loss and positive framing in click rates.

- Information presented using a Negative Frame:
  "Australians lose a lot of money each year by not switching to products that are better suited to their individual needs. The Australian Government is introducing a Consumer Data Right that aims to give people the right to safely access certain data about them held by businesses. The right will allow people to access data about themselves in a readily usable form and will also allow consumers better access to information on the products available to them."

  You can find out more information here: https://treasury.gov.au/consumer-data-right

- Information presented using a Positive Frame:
  "Australians could save a lot of money each year by switching to products that are better suited to their individual needs. The Australian Government is introducing a Consumer Data Right that aims to give people the right to safely access certain data about them held by businesses. The right will allow people to access data about themselves in a readily usable form and will also allow consumers better access to information on the products available to them."

  You can find out more information here: https://treasury.gov.au/consumer-data-right

■ Question 10 - Main body: *Over the next 12 months, how likely are you to undertake the following actions:*

■ Question 10A: *"Find out more information about the Consumer Data Right and how it might benefit you or your family"*

■ Question 10B: *"Request access to your own data from a commercial company"*

■ Question 10C: *"Attempt to use data about you to try and obtain a better product"*

■ Question 10D: *"Reduce the amount of information you provide online to reduce the risk of others getting access to your data"*

Since the aim of this study is to explore the determinants of the intention to use the CDR, we focused on Question 10C to measure an individual's intention/willingness to use the CDR.[6] In addition to the question stated above, the participants also completed a background questionnaire that included trust measures as well as other demographic questions. As trust measures, the survey recorded an individual's trust in the Commonwealth Government, State Government, financial institutions, social media companies, telecommunication companies and the Australian Bureau of statistics (ABS) to maintain the privacy of their data. These measures were recorded using a scale of 1 to 10 with 1 being *"No trust at all"* and 10 being *"Trust completely"*.

3.3 Longitudinal data linkage

To facilitate the second part of our analysis, that is to study the interaction between framing, trust and risk preferences on the decision to use the CDR, we merged the data on behavioural preferences from ANU Poll 29 (conducted in April 2019) with the data from ANU Poll 27 using a unique record ID.

In ANUPoll 29, risk preferences of 2,054 individuals were recorded using questions on time and risk preference sourced from the Global Preferences Survey.[7] These questions were of two types. Namely, self-reported questions and staircase method (or "unfolding bracket") questions. For self-reported questions, each participant rated their perceived risk preference on a 11 point scale with 0 being completely unwilling to take risks and 10 being very willing to take risks. For the staircase question, each participant was given a lottery choice sequence where the individual had to choose between winning a lottery x with some probability p or a sure payment y. Choice of the lottery by a participant resulted in an increase of the sure payment being offered in the next question.[8]

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[6] Analysis of rest of the intention measures are presented in Appendix 6.2
[7] https://www.briq-institute.org/global-preferences/home
[8] Questions are presented in Appendix 6.1
[9] https://www.briq-institute.org/global-preferences/home

on a 11 point scale with 0 being completely unwilling to take risks and 10 being very willing to take risks. For the staircase question, each participant was given a lottery choice sequence where the individual had to choose between winning a lottery x with some probability p or a sure payment y. Choice of the lottery by a participant resulted in an increase of the sure payment being offered in the next question.[10]

This process of varying the sure payment allowed to determine an individual's certainty equivalence and thereby it allowed to determine their willingness to take risks. Since the staircase questions provide a more precise quantitative indication of an individual's risk preference in a monetary setting, we utilized these responses over the self-reported responses as our measure of risk preference. Key summary statistics of ANUPoll 29 are presented in Table 2. [11]

Table 2: Summary of Key Statistics - ANUPoll 29

Field	Total	Online panel members	Offline panel members
Invited to complete survey	2,686	2,367	319
Total interviews achieved	2,054	1,825	229
Completion rate	76.5%	77.1%	71.8%
Survey start date	8-Apr-2019	8-Apr-2019	8-Apr-2019
Survey end date	26-Apr-2019	26-Apr-2019	18-Apr-2019

Table 3 presents the key summary statistics and Table 4 presents the descriptive statistics of the linked data set, respectively.

Table 3: Summary of Key Statistics of the linked data set

Field	Total	Online panel members	Offline panel members
Sample size (N) Survey	1,898	1,696	202
Survey start date	8-Oct-2018	9-Oct-2018	8-Oct-2018
Survey end date	26-Apr-2019	26-Apr-2019	18-Apr-2019

[10] Questions are presented in Appendix 6.1

[11] Source: Social Research Centre

Table 4: Descriptive statistics of the linked data set

Variable	Mean/ Proportion	S.D	Median	Min	Max
Question 10 A	3.03	1.32	4	1	5
Question 10 B	2.49	1.23	2	1	5
Question 10 C	2.71	1.24	2	1	5
Question 10 D	3.45	1.35	4	1	5
Trust in Commonwealth Government	5.49	2.33	6	1	10
Trust in Financial Institutions	4.84	2.62	5	1	10
Trust in Telecommunication companies	3.82	2.27	4	1	10
Risk preference	7.76	6.05	7	1	32
Risk preference (standardized)	2.89	1.41	3	1	5
Age	47.03	17.90	50	18	94
Female	52.74%				
Indigenous status	1.95%				
Australian born	74.26%				
Born in ESB[12]	12.39%				
Born in NESB[13]	13.34%				
Less than Year 12	32.19%				
Certificate III & IV	27.42%				
Undergraduate	30.44%				
Postgraduate	15.19%				

[12]Born in an English speaking country
[13]Born in non-English speaking country

3.4 Analytical approach

We began our analysis by investigating the determinants of the intention to use the CDR in terms of demographic factors. This was achieved by regressing an Ordered Probit model (labeled Model 0) with the dependent variable *"Question 10C - Attempt to use data about you and try to obtain a better product"* and demographic factors as explanatory variables. We controlled for differences between the sample and the Australian population by using Generalised Regression Estimation (GREG) weights.

We then proceeded to investigate the presence of framing effects on the intention to use the CDR. To do this, an Ordered Probit model (labeled Model 1) was used with the dependent variable "Question 10C". Two framing dummies were included as explanatory variables to capture the effects of negative and positive frames and also a trust dummy to capture effects of a high level of trust in the Commonwealth Government. The trust dummy variable was coded such that a value of 0 indicated a level of trust that was below the median trust level (i.e. individuals who recorded their trust as 1-5) and a value of 1 indicated a level of trust that was greater than or equal to the median trust level (individuals who recorded their trust as 6-10). For the remainder of the paper, these two categories of trust will be referred to as low trust and high trust, respectively.[14]

The modal value (using weights) for the trust variable is 5, with 19.4 per cent of respondents. The mean value is 5.5 with 48.7 per cent of (weighted) respondents having a value of 5 or less. In Model 1, we included the same set of control variables that controlled for sex, age, indigenous status and education level. In this model, a significant positive coefficient on the frame variable would indicate a framing effect and an increase in the willingness to take advantage of the CDR.

To conduct the second part our analysis, we regressed three more Ordered Probit models (labeled Model 2-4) with the dependent variable Question 10C. The second model (Model 2), investigates the interaction between framing and trust. This was achieved by including an interaction variable between trust and framing to Model 1. In model 3, we included a risk preference dummy variable and also an interaction term between risk preference and framing variables to capture the effects of risk preference and framing on the intention to

[14] An additional trust measure which defined low trust as trust below the 1st quartile (scores 1-3) and high trust as trust levels greater than the 3rd quartile (scores 7-10) was also considered. The results and the conclusions were robust to both these definitions of trust.

use the CDR.

To create the risk preference dummy variable, the measure of risk preference was initially standardized and then divided it into 5 risk preference quintiles. We then assigned a value of 0 to quintiles 1 to 3 and a value of 1 to quintiles 4 and 5. The risk preference dummy was coded such that a value of 0 indicated a level of risk preference (willingness to take risk) that was below the median risk preference and a value of 1 indicated a risk preference that was greater than or equal to the median risk preference. Therefore, the former category indicated risk averse individuals (low risk) and the latter category indicated individuals with a relatively high willingness to take risks (high risk), respectively.[15] Moreover, in this model, the interaction variables between trust and framing were excluded. The main justification for this exclusion was to isolate the effects of risk preferences and framing on the intention to use the CDR.

Lastly, in model 4, we regressed a complete model with all the explanatory variables from Model 3 as well as with two additional interaction variables. Namely, an interaction variable between framing and trust and an interaction variable between framing, trust and risk preference. The results for these models are presented in Table 5 in the following section.

[15]Similar to our trust definition, an additional risk measure which defined low risk as risk levels below the 1st quartile (individuals in quintile 1 to 2) and high risk as having risk preferences greater than or equal to the 3rd quartile (individuals in quintile 4 to 5) was also considered. The results and conclusions were robust to both these definitions of risk.

4 Results

Table 5: Determinants of hypothetical intention to use the CDR

	Model 0	Model 1	Model 2	Model 3	Model 4
Negative Framing		0.142*	−0.0488	−0.026	−0.309**
		(2.46)	(−0.59)	(−0.33)	(−2.72)
Positive Framing		0.249***	0.050	0.096	−0.205
		(4.20)	(0.61)	(1.17)	(−1.76)
Trust		0.242***	−0.056	0.222***	−0.009
		(5.04)	(0.83)	(4.03)	(−0.10)
Trust × *Negative Framing*			0.370**		0.561***
			(3.18)		(3.50)
Trust × *Positive Framing*			0.392***		0.606***
			(3.30)		(3.65)
Risk				−0.287***	−0.301**
				(−3.68)	(−2.70)
Risk × *Negative Framing*				0.510***	0.767***
				(3.78)	(3.86)
Risk × *Positive Framing*				0.370**	0.455*
				(2.81)	(2.41)
Risk × *Negative Framing* × *Trust*					0.854***
					(3.74)
Risk × *Positive Framing* × *Trust*					0.892***
					(3.91)
Female	−0.119*	−0.128**	−0.117*	−0.168**	−0.168**
	(−2.46)	(−2.64)	(−2.42)	(−3.12)	(−3.11)
Age	0.020*	0.024**	0.025**	0.027**	0.027**

	(2.55)	(3.06)	(3.12)	(3.04)	(3.09)
Age^2	-0.0002^{***}	-0.0003^{***}	-0.0003^{***}	-0.0004^{***}	-0.0004^{***}
	(-3.75)	(-4.25)	(-4.32)	(-4.23)	(-4.29)
Indigenous status	0.037	0.08	0.027	0.067	-0.0163
	(0.26)	(0.55)	(0.19)	(1.13)	(-0.10)
Born in ESB	0.075	0.0432	0.043	0.102	0.105
	(0.89)	(0.51)	(0.51)	(4.32)	(1.16)
Born in NESB	0.245^{***}	0.238^{***}	0.236^{***}	0.317^{***}	0.316^{***}
	(3.76)	(3.64)	(3.60)	(4.32)	(4.30)
Less than Year 12	-0.119^{*}	-0.01	-0.104	-0.028	-0.032
	(1.98)	(1.65)	(1.72)	(0.43)	(0.48)
Certificate III and IV	0.162^{**}	0.144^{*}	0.150^{**}	0.264^{***}	0.268^{***}
	(2.83)	(2.54)	(2.60)	(4.18)	(4.23)
Undergraduate	0.019	-0.004	-0.019	0.078	0.055
	(0.26)	(-0.06)	(-0.27)	(1.00)	(0.68)
Postgraduate	0.020	0.011	-0.015	0.056	0.008
	(0.21)	(0.11)	(-0.16)	(0.52)	(0.08)
N	2,081	2,079	2,079	1,812	1,812

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

According to Model 0, we see that males are more likely to take up the CDR relative to females. Moreover, it also evident that individuals who are relatively old and born in a non-English speaking country are more likely to use the CDR. In terms of education, the model suggests that individuals who have who have completed level *III/IV* certificate are the more likely to use the CDR. The implications of these variables on the intention to use the CDR stay unchanged when accounted for trust and risk preference as well. More specifically, comparing the results from Model 0 with Model (1)-(4), we see that males, individuals who are relatively old, individuals born in a non-English speaking country and individuals with level *III/IV* certificate are always more likely to use the CDR.

Model 1 shows the pure effects of framing on the hypothetical willingness to use the CDR. According to the model, we see evidence that both negative and positive framing increased the likelihood of using the CDR relative to neutral framing. In terms of trust, we see that individuals with a high level of trust in the Commonwealth Government (with regards to data) are more likely to use the CDR relative to low trust individuals.[16] Model 2 explores the moderating effects of framing and trust. To achieve this, we interacted each framing variable with the trust variable. The model suggests that the pure effects of framing becomes insignificant whereas the interaction becomes significant. More specifically, it is evident that high trust amplifies the effects of framing relative to effects of framing on low trust individuals.

Model 3 shows the relationship between risk preferences and willingness to use the CDR. The results suggest that individuals with higher willingness to take risk are more likely to take up the CDR. Furthermore, we see a strong interaction between risk and framing. The results suggest that framing has a larger impact on risk seekers relative to risk averse individuals. Moreover, we see that individuals with a high level of trust in the Commonwealth Government are still more likely to use the CDR. Model 4 explores the effects of framing, risk preference and trust on the intention to use the CDR. A strong interaction between these three variables is evident from the results. The results highlight that the impact of framing is more significant on risk seekers with high level of trust. Similar to the results from Model 2 and Model 3, we also see that the impact of framing is magnified on individuals with high trust and on risk seekers when interacted with framing individually (two-way interactions). However, an important result to note here is that negative framing on individuals with low trust and low willingness to take risks, reduces the probability of taking up the CDR.

In order to quantify the precise impact of framing, trust and risk preference and their interaction on the intention to use the CDR, we calculated the expected probability of choosing *"Very Likely"* and *""Likely"* for using the CDR (Q10c) (i.e. expected probability of using the CDR) for different framing techniques, different levels of trust and risk. Figures (1)-(4) present these results.[17]

[16] We find similar results for trust in financial institutions and telecommunication companies. This implies that the trust in the message source and the service providers are equivalently important. Results are provided in Appendix 6.3

[17] Average marginal effects are given in Appendix 6.4

Figure 1: Expected probability of choosing 'Very Likely' and 'Likely' for Question 10.C for a given Frame

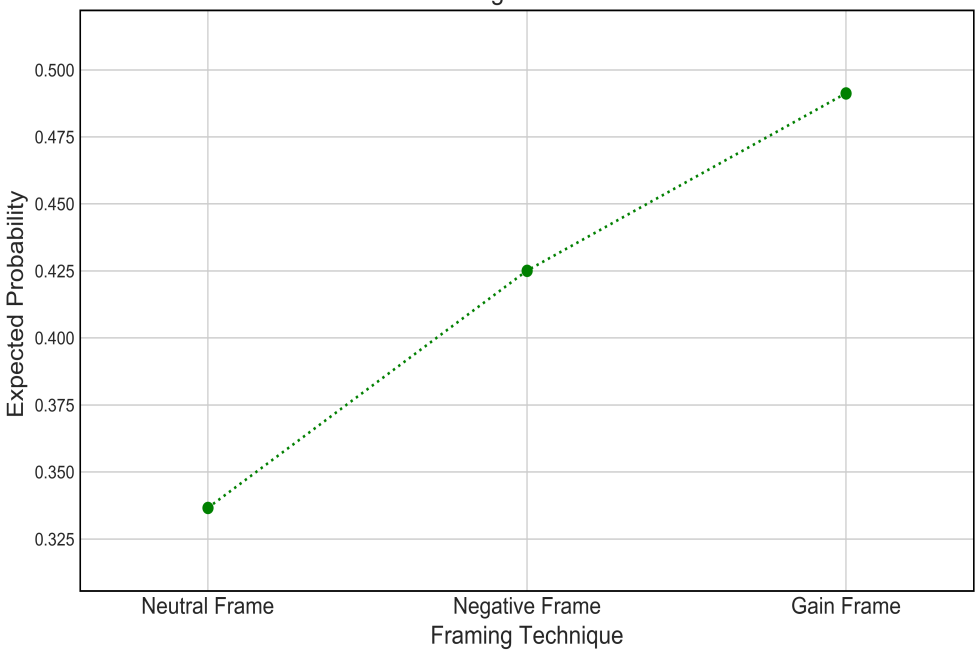

Figure 2: Expected probability of choosing 'Very Likely' and 'Likely' for Question 10.C for a given Frame and Trust Level

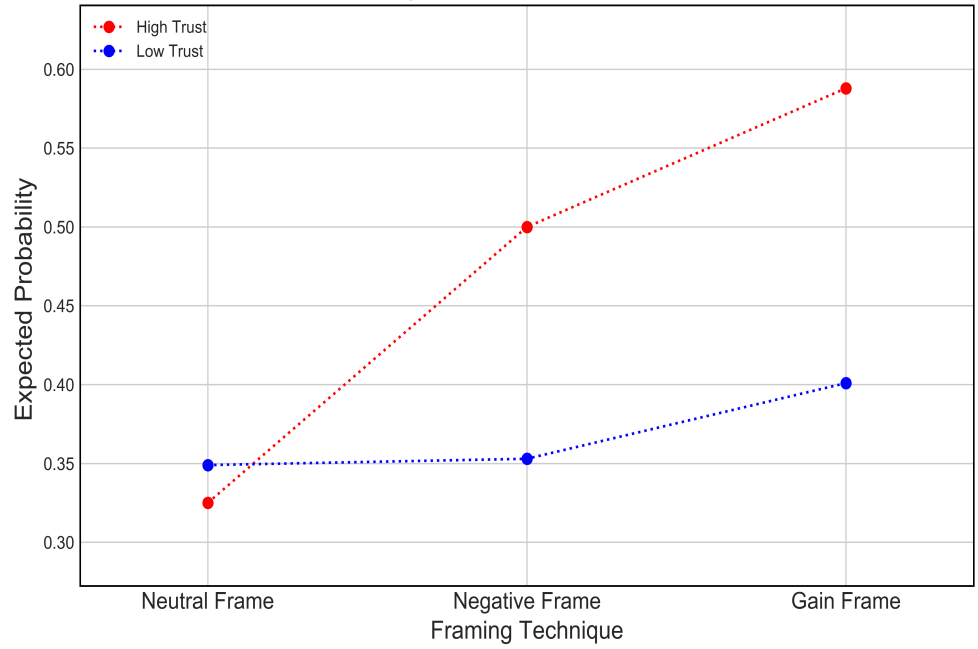

Figure 3: Expected probability of choosing 'Very Likely' and 'Likely' for Question 10.C for a given Frame and Risk Preference

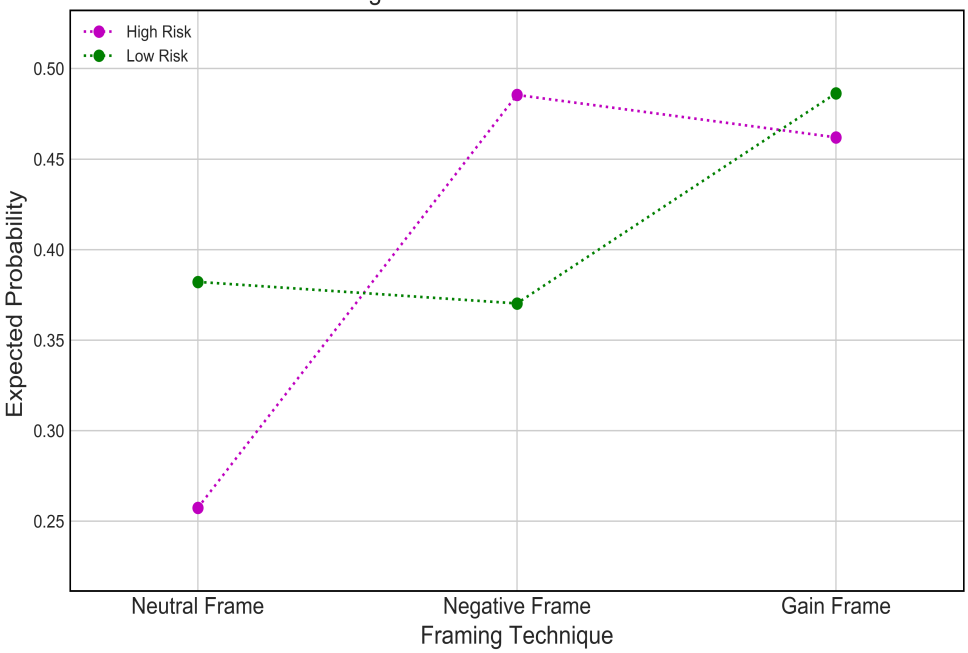

Figure 4: Expected probability of choosing 'Very Likely' and 'Likely' for Question 10.C for a given Frame, Risk Preference and Trust level

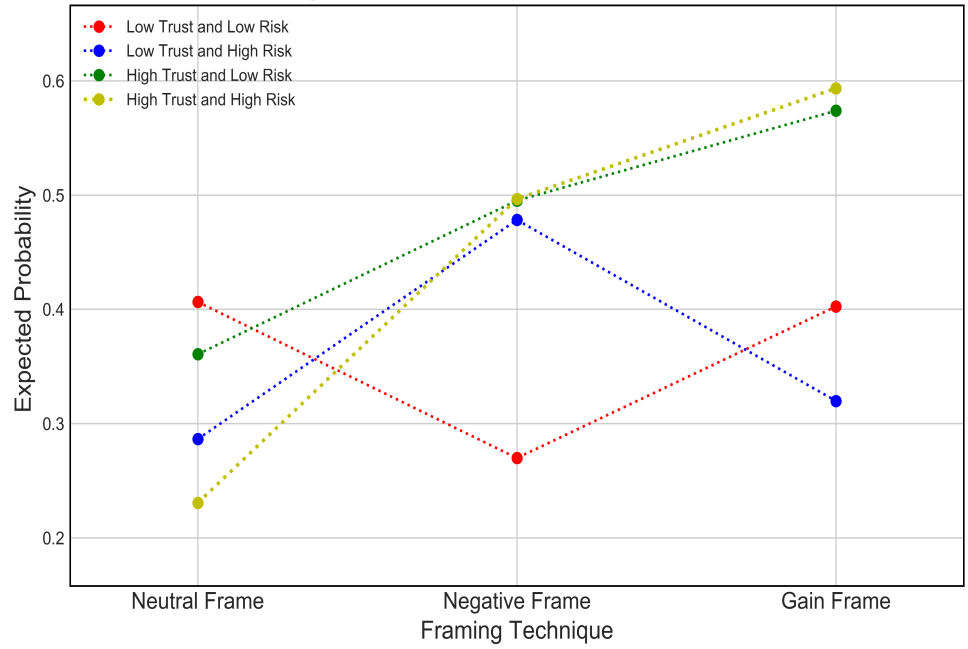

Figure 1 shows the pure effects of framing on the expected probability to use the CDR. The results suggest that, ceteris paribus, the expected probability of the intention to use the CDR is maximized when a positive frame is used. More specifically, it suggests that an individual is approximately 50% more likely to use the CDR if the choice was presented using a positive frame instead of a neutral frame and 16% more likely if the choice was presented using a positive frame instead of a negative frame. When comparing the results of neutral framing and negative framing, we see that using a negative frame instead of a neutral frame increased the probability of willingness to use the CDR by approximately 30%. In figure (2) - (4), we explored how behavioural traits such as trust and risk preference interact with framing and their overall effect on the intention to use the CDR.

Figure 2 highlights the relationship between the expected probability of the intention to use the CDR and framing for a given level of trust. The figure shows that the impact of framing is significantly larger for individuals with higher trust relative to low trust individuals. Those with low trust level display a small framing effect (i.e. approximately 0.35 probability for both neutral and negative frame and 0.40 for positive frame) while those with high level of trust show significant susceptibility to both negative and positive frames (with respective probabilities of 0.49 and 0.58).

Figure 3 depicts the relationship between the expected probability of the intention to use the CDR and framing for each point on the risk preference distribution. The figure shows that for a risk averse individual (low risk), negative framing depressed the expected probability of taking up the CDR relative to both neutral framing and positive framing. That is, if the choice was presented using negative framing relative positive framing, the expected probability of using the CDR reduced approximately by 30% (0.37 as opposed to 0.48). Furthermore, the expected probability reduced by 2% if negative framing was used instead of neutral framing. However, interestingly, the framing effects works in the opposite direction for risk seekers (high risk). The figure suggests that negative framing was most effective for risk seekers (with 0.48 expected probability of using the CDR). More importantly, we can see that risk seekers are 90% more likely to take up the CDR if the choice was presented using a negative frame instead of a neutral frame (0.48 as opposed to 0.25). This result emphasizes the importance of using the appropriate framing technique specifically for that individual. That is, the result shows that correct framing technique can increase the expected probability of the intention to use the CDR by nearly 90%.

Lastly, Figure 4 shows the combined effect of framing, trust and risk preference on the intention to use the CDR. Similar to previous graphs, we used the expected probability of the intention to use the CDR to quantify these effects. First thing to note here is that when individuals have a high level of trust in the Commonwealth Government, irrespective of the risk preference, both negative and positive frames increased the probability of using the CDR relative to neutral framing. More specifically, *High Trust and Low Risk* individuals were 36% more likely to use the CDR when the choice was presented using negative frame instead of a neutral frame and 60% more likely to use the CDR when the choice was presented using a positive frame instead of a neutral frame. Similarly, *High Trust and High Risk* individuals were more than twice as likely to use the CDR if the choice was presented using a negative frame or positive frame instead of a neutral frame (i.e. 0.49 vs. 0.23 and 0.59 vs. 0.23, respectively.)

Furthermore, it can also be seen that when individuals have a low level of trust, different risk attitudes interact with framing techniques in the opposite way. For example, for *Low Trust and Low Risk* individuals, neutral framing maximized the expected probability of using the CDR relative to negative framing and positive framing (0.41 vs. 0.26 vs. 0.4, respectively.). It is also evident that using a negative frame reduced the expected probability of using the CDR by approximately 37% relative to neutral frame and 35% relative to positive framing. However, contrastingly, for *Low Trust and High Risk* individuals, negative framing maximized the expected probability of the intention to use the CDR (0.47 probability) relative to both neutral and positive framing. For these individuals, using a negative frame increased the probability of taking up the CDR by 68% relative to neutral framing and 47% relative to positive framing. An important take away from Figure 4 is that, the direction of framing effects depends on the level of trust individuals have in the source. More specifically, for individuals with high trust, their risk attitude only affected the *magnitude* of the framing effects and not the direction. In contrast, when individuals have low level of trust in the source, their risk attitude dictated **both** the *magnitude* and the *direction* of framing effects.

5 Discussion, implications and future work

The Consumer Data Right or CDR is a major policy initiative that has the potential to improve the level of service received by Australian consumers (beginning with the banking

sector) and the efficiency of markets. However, it is only going to have a positive impact if a sufficient number of consumers find out information about it, and if they are motivated to take up the option of accessing and sharing their data.

The CDR is also a policy initiative that allows us to learn something about the way in which people take into account data privacy and are comfortable to use data held on them by organisations. In their widely read book on *Reinventing Capitalism in the Age of Big Data*, Mayer-Schonberger & Ramge (2018)argue that "The availability of rich data and recent technical break throughs mean that we now can move beyond money-based markets to data-rich ones and overcome some of the key informational and decisional constraints that we have been grappling with." There are likely to be many future initiatives both in Australia and elsewhere that attempt to leverage big data sets on individuals not just for company profits, but also for pro-consumer welfare enhancements.

We show in this paper that there is a reasonably large willingness to engage with a policy like the CDR. Nearly half the sample responded that they would be likely or very likely to find out more information about the CDR, and nearly 2 out of every 5 said that they would "Attempt to use data about you to try and obtain a better product." If these intentions are translated into actions, then this has the potential to significantly improve the efficiency of the relevant markets.

The way in which the CDR is framed, however, has a significant effect on the willingness to participate. Leaving aside trust and risk for now, framing the CDR as potential gains or avoiding foregone losses has a large effect on willingness to participate, relative to a more neutral framing. While this is perhaps not surprising, it reinforces the need to use information that is salient to the individual when presenting new initiatives, and to make sure the potential benefits of the CDR are consistently reinforced.

What is interesting though, and arguably only possible to directly test with a survey experiment like the one covered in this paper, is that there is not only a large association between trust in government and risk preference in willingness to participate in the CDR, but also that these characteristics are associated with very large differences in treatment effects..

Those who have relatively high trust in government with their data are more like to say that they are likely or very likely to take advantage of the consumer data right. However, when we interact trust and framing, we show that there is no difference between high trust

and low trust individuals with the neutral framing, and that framing effects only occur for those with high trust in government. Trust appears to be a pre-requisite for more explicit messages to have an effect.

The relationship between risk preference and willingness to participate in the CDR is even more complicated. With neutral framing, it is those who are least willing to take (financial) risks that are most willing to participate in the CDR. Under negative framing, high risk individuals have a much higher probability of participating, whereas for positive framing the probability is similar for both high and low risk individuals.

The field of behavioral insights has focused to a large extent on the effect of nudges for populations as a whole, or particular demographic/geographic groups. Our research contributes to a burgeoning literature that highlights the potential for next-generation nudges to be better targeted based on what we know about individuals beyond their age, sex and geographic location.

The specific implications of the research regarding framing of the CDR for potential participants depends very much on what is known about consumers. If very little is known (no information or basic demographics only), then the optimal strategy appears to be to frame the CDR in terms of what the consumer can gain. However, more information on the consumer could lead to a more effective and targeted strategy. If you only know a person's risk level or trust level, then positive framing leads to either the same probability of participating as negative framing or sometimes a higher probability, and is always associated with a higher probability than neutral framing. However, there are further interactions between trust, risk and framing when all three are included in the model and there is one group for which positive framing has a significantly lower probability than negative framing – low trust and high risk individuals.

The above three-way interactions lead to two important recommendations. First, that when engaging with individuals with regards to the CDR or similar policy initiatives, more information is better. Some small screening questions might be useful, as might information on previous decision making. If trust in government with regards to data can be improved, however, not only will the willingness to participate be higher, but there will be less need to avoid positive framing. It is only amongst high risk individuals that positive framing has a lower probability than negative framing. The second recommendation then is that research and policy interventions be targeted towards increasing trust in government with regards to

data, and that policies that have the potential to reduce that trust be seriously questioned. This is an important area of ongoing research using ANUPoll and other data sources.

One of the limitations of the analysis in this paper is that we only have information on willingness to participate in the CDR, not on the actual participation. This was all that was available at the time of data collection, as the CDR had not yet been implemented. It has been implemented now but only for the banking sector. In future analysis, we hope to test for the relationship between willingness to participate and actual participation, as well as test for the effect of framing, trust, and risk on actual participation. Ideally, this should be done using field experiments where information is known on the individual's background.

A further set of research that we are actively engaging in and which the data presented in this paper has relevance for is the introduction of and opt-out framework for participation in the electronic MyHealth record. While in a very different policy domain (provision of health services), there are a number of similarities. Like the CDR, MyHealth involves the sharing of sensitive data between government and non-government entities on individuals, in a way that increases perceived (and potentially actual) risk of privacy breaches, and that has potential benefits for individuals and for the system as a whole. Initial analysis of MyHealth data suggests that framing has less of an effect (perhaps because of the use of opt-out rather than opt-in), but that risk preference and trust with regards to data is equally important. Comparing and contrasting findings across these two policy areas has the potential to shed light on the context in which framing, trust and risk matter.

Ultimately, this paper has focused on an important policy initiative in the Australian context, and with international implications (for example, with regards to Open Banking in the UK). It has contributed to the literature on framing (it matters), trust (low trust is a negative for policy interventions) and risk aversion (it interacts with the messages of government).

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6 Appendix

6.1 Staircase ("unfolding bracket") questions used to measure risk preferences

- What would you prefer: a 50% chance of winning $900 when at the same time there is 50% chance of winning $0, or would you rather have the amount of $30 as a sure payment?

If the lottery was chosen, the sure payment was increased by $30. For example,

- What would you prefer: a 50% chance of winning $900 when at the same time there is 50% chance of winning $0, or would you rather have the amount of $60 as a sure payment?

6.2 Analysis of other intention to participate in the CDR measures

Question 10A - Find out more information about the Consumer Data Right and how it might benefit you or your family.

Question 10B - Request access to your own data from a commercial company.

The determinants of Question 10A is given in Model 5 and determinants of Question 10B is given in Model 6.

Table 6: Determinants of hypothetical intention to use the CDR

	Model 5	Model 6
Negative Framing	0.030	−0.0564
	(0.28)	(−0.50)
Positive Framing	−0.249	0.100
	(−0.17)	(0.86)
Trust	−0.0513	−0.222*
	(−0.57)	(−2.03)
Trust × *Negative Framing*	0.0608	0.0808
	(0.39)	(0.51)
Trust × *Positive Framing*	0.490**	−0.005
	(3.00)	(−0.04)
Risk	−0.213	0.163
	(−1.95)	(1.47)
Risk × *Negative Framing*	0.234	−0.0629
	(1.20)	(−0.32)
Risk × *Positive Framing*	0.627***	−0.222
	(3.37)	(−1.18)
Risk × *Negative Framing* × *Trust*	0.284	0.239
	(1.27)	(1.06)
Risk × *Positive Framing* × *Trust*	0.719**	−0.261
	(3.20)	(−1.15)
Female	−0.0473	−0.0931
	(−0.89)	(−1.74)
Age	0.0321***	0.0318***
	(3.67)	(3.59)

Age^2	-0.00362^{***}	-0.00370^{***}
	(-4.16)	(-4.19)
Indigenous status	0.220	0.161
	(1.41)	(1.02)
Born in ESB	0.0545	0.0946
	(0.61)	(1.04)
Born in NESB	0.183^{*}	0.119
	(2.53)	(1.63)
Less than Year 12	0.0215	-0.0802
	(0.33)	(-1.20)
Certificate III and IV	0.159^{*}	0.215^{***}
	(2.56)	(3.42)
Undergraduate	0.249^{**}	0.0766
	(3.14)	(0.96)
Postgraduate	0.263^{*}	0.229^{*}
	(2.48)	(2.14)
N	2,079	1,815

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Question 10A is not a perfect measure of hypothetical participation in the CDR because the question only measures an individuals willingness to *learn* more about the CDR. According to model 5, we find an interaction between positive framing and trust, positive framing and risk, and positive framing, trust and risk. This implies that individuals who have a higher level of trust in the Commonwealth government and/or have a higher risk preference are more likely to *learn* more about the CDR when information regarding the CDR is presented in terms of gains they can obtain. However, contrastingly, we see that negative framing has no effect both in terms of pure effects and/or as an interaction. The prime justification for this result could be that the action of *learning* more about the CDR involves no risk. Therefore, the use of negative framing instead of neutral framing yields no difference. In

terms of demographic variables, it is evident that individuals who are older, individuals born in a non-English speaking background, individuals have completed their Certificate *III and IV*, or undergraduate or postgraduate studies are more likely to find out more information about the CDR.

Question 10B measures a participants likelihood of requesting information regarding them from a commercial company. Even though Question 10B partially measures the intention to participate in the CDR, it is not a perfect measure. This is because the CDR gives the customers a right to access data about them held by businesses, *and also to share this information with accredited and trusted third parties of their choice*. The potential benefits that customers acquire and the potential risks they may face stems from the latter part of the data right. That is, by sharing their information with other accredited third parties in order to find a better product/service. According to model 6, we see no significant effects of framing, trust and risk on the intention to request own data from a commercial company. In terms of demographics, a positive relationship between *age* and intention to request is evident. Moreover, individuals who are have completed their Certificate *III and IV* or postgraduate studies are more likely to request access to their own data as well.

6.3 Effect of trust in financial and telecommunication companies on the intention to use the CDR

Model 7 presents the effects of trust in financial institutions on the intention to use the CDR (Question 10C). In this case, the trust dummy was coded such that, value of 0 indicated individuals with a below median level of trust (i.e. scores 1-4) and value of 1 indicated individuals with a trust level greater than or equal to the median trust level (i.e. scores 5-10).

Model 8 presents the effects of trust in telecommunication companies on the intention to use the CDR (Question 10C). In this case, the trust dummy was coded such that, value of 0 indicated individuals with a below median level of trust (i.e. scores 1-3) and value of 1 indicated individuals with a trust level greater than or equal to the median trust level (i.e. scores 4-10).

Table 7: Determinants of hypothetical intention to use the CDR

	Model 7	Model 8
Negative Framing	0.133*	0.135*
	(2.30)	(2.33)
Positive Framing	0.257***	0.252***
	(4.32)	(4.23)
Trust	0.128**	0.230**
	(2.62)	(2.96)
Female	−0.135**	−0.125*
	(−2.76)	(−2.50)
Age	0.0234**	0.0232**
	(2.92)	(2.90)
Age^2	−0.00362***	−0.0003***
	(−4.02)	(−4.01)
Indigenous status	0.0165	0.0669
	(0.11)	(0.46)
Born in ESB	0.0444	0.0597
	(0.56)	(0.73)
Born in NESB	0.221***	0.214***
	(3.37)	(3.25)
Less than Year 12	−0.127*	−0.123*
	(−2.10)	(−2.04)
Certificate III and IV	0.156**	0.159**
	(2.71)	(2.76)
Undergraduate	0.006	0.021
	(0.09)	(0.29)

Postgraduate	0.017	0.0147
	(0.17)	(0.15)
N	2,080	2,077

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.4 Marginal effects

Table 8: Average marginal effects - Effects of framing on intention to use CDR (Question 10C)

Variable	Marginal effects
Neutral frame	·
Negative frame	0.09
Positive frame	0.15

Table 9: Average marginal effects - Effects of framing and trust on intention to use CDR (Question 10C)

Variable	Marginal effects
Neutral frame	·
Negative frame	
Low trust	0.001
High trust	0.173
Positive frame	
Low trust	0.04
High trust	0.26

Table 10: Average marginal effects - Effects of framing and risk on intention to use CDR (Question 10C)

Variable	Marginal effects
Neutral frame	·
Negative frame	
Low risk	-0.002
High risk	0.228
Positive frame	
Low risk	0.104
High risk	0.204

Table 11: Average marginal effects - Effects of framing, trust and risk on intention to use CDR (Question 10C)

Variable	Marginal effects
Neutral frame	·
Negative frame	
Low trust × *Low risk*	-0.141
Low trust × *High risk*	0.179
High trust × *Low risk*	0.130
High trust × *High risk*	0.267
Positive frame	
Low trust × *Low risk*	-0.016
Low trust × *High risk*	0.030
High trust × *Low risk*	0.199
High trust × *High risk*	0.359