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* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.

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To stay or go? Consumer bank switching behaviour after government interventions*

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Abstract

We analyse whether and how individual savings and current accounts holders respond to government interventions at banks. We are the first to employ a difference-in-difference analysis, distinguish between a nationalisation and a capital injection, and separate between the two banking products. We find that the aggregate switching behaviour of consumers at intervened banks is similar before and after the troubles and intervention. This holds for both type of interventions, both type of products, and for switching from and to the intervened bank. However, we show heterogeneity in consumer responses to government interventions, depending on the type of intervention and banking product. For example, compared to consumers who trust the government, consumers with no or little trust are more likely to switch away from a bank after a nationalisation, relative to customers of the control bank. This holds for switching with the savings and current account. This highlights that trust in the government is an important prerequisite for a successful nationalisation. Second, responses depend on consumers' level of risk aversion. Risk averse current account holders at a nationalised bank are more likely to switch away than customers of the control bank. This result indicates that interventions can make consumers more aware of the troubles the intervened bank faces, and result in an outflow of consumers if a large share is risk averse.

Keywords: consumer bank switching, bail-outs, capital injection, nationalisation, trust in the government, risk aversion.
JEL classifications: D14, G21, G28.

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1. Introduction

Many countries have been confronted with instability in the banking sector since the outbreak of the financial crisis. To prevent banks defaulting, bail-out operations have been conducted all over the world. Although the goal of such operations is clear, the consequences are unclear and intensively debated. One potential implication of bailing out distressed financial institutions is that it encourages risky behaviour by these institutions and their investors if they anticipate bail-outs. As a result, recent studies examine bank responses to government interventions. These studies focus on the effect of bail-outs on bank risk-taking (Duchin and Sosyura, 2014; Black and Hazelwood, 2013; Ianotta et al., 2013; Dam and Koetter, 2012; Gropp et al., 2011; Cordella and Yeyati, 2003), liquidity creation (Berger et al., 2016) or bank competition (Calderon and Schaeck, 2016).

To date, less is known about household responses to government interventions. Berger and Turk-Ariss (2015) and Hasan et al. (2013) argue that bail-outs might reduce market discipline as default risk is reduced and therefore also the need to monitor and discipline banks. They reason that, at the same time, the negative press coverage accompanying government interventions may damage the bank's reputation. This increase in the public's awareness of bank risk and (mis)management might trigger a customer response. There is some empirical evidence that bail-outs indeed affect customer behaviour. Van der Cruijsen et al. (2012) show that Dutch customers of troubled banking institutions are more likely to move funds across banks and spread their savings than customers of other banks. Brown et al. (2016) find that households are more likely to withdraw from distressed banks that received a capital injection, although this effect is mitigated by switching costs. According to Iyer and Puri (2012) consumers who panic do not return to the bank.

We add to existing literature by examining the effects of government interventions on switching banks by consumers.[2] A priori, the effect of these interventions is ambiguous. If consumers are rational and focus on bank risk, customers of bailed-out banks might be more inclined to stay at their bank than customers of other banks, given that default risk is significantly reduced. On the other hand, there might be other reasons why consumers would switch from the bank. An example is increased awareness of bank risk.

Our study contributes to the literature in several ways. We have a panel dataset rather than a cross-sectional dataset, which is used in previous studies (Brown et al., 2016; Van der Cruijsen et al., 2012). Therefore we can apply a difference-in-difference estimator which allows us to take systematic differences in the behaviour of customers of different banks into account. We show that this is important as pre-intervention switching proportions differ across the bailed-

[2] In the household finance literature, a household often refers to the head of household. In our analysis we also include other members of the household.

out and control bank. Furthermore, we distinguish between savings accounts and current accounts as Van der Cruijsen and Diepstraten (2015) show that both switching propensities and the main factors related to switching depend on the banking product. To gather information on switching behaviour, we would ideally use data from a deposit register. However, as such register does not exist we collect survey data. The advantage of survey data is that it allows us to make cross-bank comparisons, which is not possible using administrative data from a single bank. We take the scope of government interventions into account by differentiating between a nationalisation and a capital injection. Van der Cruijsen et al. (2012) and Brown et al. (2016) show that the size and scope of government interventions are important for subsequent consumer behaviour. However, the current literature does not yet differentiate between types of government interventions in studying consumer switching behaviour.

We first study the aggregate effect of each intervention on switching away from a bank by existing customers at the intervened bank, compared to customers' switching behaviour at the control bank. We then examine heterogeneity across bank customers. If consumers respond to default risk and are well-informed about this risk, we expect that the intervention can prevent an increase in the outflow of customers of a bailed-out bank. This effect is expected to be relatively strong for risk-averse customers. On the other hand, the intervention may result in a stronger awareness of the bank's financial problems, which may trigger an outflow of risk-averse customers. A second factor we take into account is the extent to which someone trusts the government. After a nationalisation the government becomes the owner of the bank. As a result we hypothesize that consumers with no or little trust in the government are more likely to switch away from a bank after a nationalisation than consumers who trust the government. As the government does not become the owner of the bank after a capital injection, we expect no effect in this case.

For both the intervener and bank manager, it is essential to understand if and how interventions shape customer behaviour to highlight potential unintended consequences. Therefore our study provides important insights in the debate about the design of government interventions. Since the bank's customer base impacts the required liquidity within the Basel III framework (Basel Committee on Banking Supervision, 2013), understanding how customers respond to bail-out operations is key.

Our research contributes to different strands of the literature. First, we add to studies on consumer responses to government interventions (e.g. Brown et al., 2016; Hasan et al., 2013; Van der Cruijsen et al., 2012). Second, we relate to work on consumer switching behaviour and bank runs (Iyer et al., 2016; Iyer and Puri, 2012; Van der Cruijsen and Diepstraten, 2015; Kiser, 2002). Third, we link to studies on the effects of risk aversion and trust (e.g. Van Rooij et al., 2011; Guiso, 2010; Chanley et al., 2000).

Given the relative stable history of the Dutch banking sector but turbulent crisis years, the Netherlands provides an excellent case to study the impact of government interventions. Between the end of the Second World War and 1983 only three banks failed, all of which had only a limited number of deposit holders (Scheltema et al., 2010). In the years up to 2007 one bank failed. From then on the situation changed considerably. Between 2008 and 2009 three banks went bankrupt. Two of the largest banks received a capital injection in 2008. In addition, the Dutch parts of Fortis Bank and ABN Amro were nationalised in 2008, and SNS REAAL was nationalised in 2013.

We find favourable effects of government interventions: the aggregate switching behaviour of consumers at intervened banks is similar before and after the troubles and intervention. This holds for both type of interventions and banking products. Second, we document heterogeneity in consumer responses to government interventions. Compared to consumers who trust the government, consumers with little or no trust are more likely to switch away after a nationalisation, relative to customers of the control bank. This holds for both the savings account and the current account. Second, we show that risk-averse consumers are more likely to switch away after a nationalisation relative to customers of the control bank. A possible explanation is that the intervention has made people more aware of the financial problems at the intervened bank. These results yield important policy implications, given that the goal of such intervention is to secure trust and stability in the system. However, when a large proportion of customers does not trust the government or is risk averse, the opposite will occur. Last, we find that consumers with less trust in the government are more likely to maintain current accounts with a capital-injected bank, relative to the control sample. Hence, our results also imply that consumer responses depend on both the banking product and the type of intervention.

The remainder of this paper is structured as follows: Section 2 provides an overview of the related literature. Section 3 delivers background information on the Dutch banking sector. Section 4 presents our data. Section 5 includes our analyses of aggregate switching behaviour, whereas Section 6 shows the analyses of heterogeneity in consumers' responses to interventions. Section 7 presents the conclusion.

2. Literature

2.1 Consumer responses to government interventions

Our paper is closest to Brown et al. (2016) and Van der Cruijsen et al. (2012), who both use a cross-sectional dataset. The former study examines interventions at two large Swiss banks and shows that consumers' deposit accounts at distressed banks are more likely to experience an outflow of funds and are more likely to be closed than their non-distressed counterparts. The authors find that the scope of the intervention matters. The propensity to withdraw funds and to

close an account is higher for the bank which is both recapitalized and bailed out by the government than for the bank that only received a capital injection from private investors. This effect is mitigated by switching costs arising from a tight relationship with the bank; customers with an exclusive or broad relationship with the distressed bank are less likely to withdraw. The results are qualitatively robust across respondents with different levels of deposit insurance coverage, knowledge of the scheme and financial literacy. However, households who are less likely to be covered, with more knowledge of the scheme and who are more financially literate are more likely to switch than others.

Van der Cruijsen et al. (2012) show that negative experiences with the banking sector led Dutch households to more actively manage their savings accounts. Customers of troubled banks are more likely to spread their savings and to move funds across banks than others. Again, the size of the shock is important. Consumers who experienced both a bail-out and a bankruptcy are most active.

Others focus on market discipline when researching customer responses to government interventions. Berger and Turk-Ariss (2015) find that market discipline decreased during the crisis for large US banks and both small and large banks in the EU. They argue that this is the result of government interventions. In contrast, for Central European countries Hasan et al. (2013) find that subsidiaries of parent companies that received government aid faced more deposit outflows than other banks. This implies that depositors view government support as a sign of difficulties at the parent, and hence the potential stabilising effect of government aid is overshadowed by reputational damage.

2.2 Bank switching behaviour and bank runs

We contribute to the literature on switching behaviour by providing insight into the impact of an event on switching. Prior studies on switching behaviour focus on individual characteristics that explain differences in switching (propensities). Kiser (2002) finds that married persons, persons with a four-year college degree and persons with higher income are less likely to remain with their first- ever bank than their counterparts. Chakravarty et al. (2004) show that customers who feel that the bank is reliable, empathetic and responsible are less likely to switch banks than customers who do not have these feelings. In addition, multiple studies provide evidence that the relationship between the bank and the customer is important. Individuals who bank with a single bank (Brunetti et al., 2016), individuals who have more services at the main bank (Brunetti et al., 2016) and individuals with a longer relationship with the bank are less likely to switch than others (Chakravarty et al., 2004). In contrast, customers who filed a complaint in the past and customers who switched before are more likely to switch (Chakravarty et al., 2004). Van der Cruijsen and Diepstraten (2015) research the most important factors explaining differences in switching

propensities for individual banking products. The bank-customer relationship and socio-psychological factors are the most important factors in explaining variation in the propensity to switch the current account. The bank-customer relationship and switching experience are the most important drivers of savings accounts' switching propensities, while switching experience and personal characteristics are key for mortgage loans.

A different but related measure is the withdrawal of funds. Several studies focus on bank runs and on which depositors are more likely to withdraw all their deposits. Iyer and Puri (2012) find that deposit insurance matters, but is only partially effective in preventing bank runs. Even though customers with balances over the insurance limit are more likely to withdraw their deposits, depositors with balances below the insurance limit also do this. The bank-customer relationship can help reduce bank fragility as depositors who currently have a loan or had one in the past, as well as depositors who have a longer relationship with the bank are less likely to withdraw all their deposits than other customers. Besides, customers are more likely to withdraw all their funds if other depositors in their social network also do this. Moreover the authors find that customers who panic do not return to the bank. Davenport and McDill (2006) analyse depositor behaviour at a failed institution and also find that insured depositors withdraw funds. They document heterogeneity in withdrawals across account types. Iyer et al. (2016) show that certain depositors are more likely to run than others and therefore the fragility of the bank is affected by the depositor base. By studying a low and high solvency risk shock to the same bank, the authors conclude that the nature of the shock shapes customer responses. Depositors with loan linkages are for example more likely than others to withdraw all their funds in case of a high-solvency-risk shock, while they are less likely to do so in a low-solvency-risk-shock. Customers with longer relationships are less likely to withdraw all their deposits than customers with a short relationship in both circumstances.

2.3 Trust

Our study also relates to the literature on trust because we examine whether switching behaviour depends on the level of trust in the government. Many studies provide evidence that trust impacts households' financial decision-making. Guiso et al. (2008) find that households with more trust in other people (generalized trust) and households with more trust in their financial advisor (personalized trust) are more likely to directly invest in the stock market, and to own risky assets (shares, mutual funds, corporate bonds, put and call options). Moreover, people with higher levels of trust in others are more likely to become entrepreneurs (Guiso et al., 2006).

Guiso (2010) documents a dramatic drop in trust in banks and the financial market after the outbreak of the financial crisis in the US. Patterns are similar in European countries, confirming that the drop in trust was universal (e.g. Guiso, 2010; Knell and Stix, 2015). Uslaner

(2014) finds that the financial crisis of 2008 has had a stronger impact on trust in institutions than on generalized trust in the US. Ananyev and Guriev (2015) study the Russian economic crisis in 2009 and find that the crisis reduced generalized trust. Van der Cruijsen et al. (2016) focus on personal crisis experiences and provide evidence that such experiences reduce trust in banks as well as generalized trust, while trust in the supervisor does not depend on personal crisis experiences.

Not only did trust in financial markets drop recently; trust in the government has also decreased (Kong, 2013). Empirical work on determinants of trust in the government shows that negative perceptions of the economy, increasing public concern about crime and political scandals trigger a decline in citizens' trust in the government (Chanley et al., 2000). Another commonly heard, but hard to test, explanation is the failing performance of the government and public sector (Van de Walle et al., 2008). A decline in trust in the government in turn leads to less support for government spending and activity (Chanley et al., 2000). Rudolph and Evans (2005) show that a citizen's ideology moderates this relationship: the effect of trust on support for government spending is more pronounced for conservatives than for liberals. Jimenez and Iyer (2016) show that trust in the government also shapes an individual's own behaviour as trust has a positive effect on both perceived fairness of the tax system and compliance with the system.

2.4 Risk aversion

Lastly, our study is connected to work which relates households' risk aversion to financial decision-making because we research whether the effect of government interventions depends on consumers' degree of risk aversion. Barsky et al. (1997) document that households who are more risk-tolerant are more likely to have stocks. Less risk-tolerant households are more likely to have Treasury bills and savings accounts. Van Rooij et al. (2011) confirm the correlation between risk aversion and stock market participation: households who are not willing to take risks are less likely to have stocks. Guiso and Paiella (2006) find that risk-averse consumers are not only less likely to own risky assets but also less likely to be self-employed and to hold insurance. Beer et al. (2010) document that risk seeking Austrian households are more likely to take out a housing loan in a foreign currency. In contrast, in Central and Eastern European countries risk aversion does not affect the currency composition of loans (Fidrmuc et al., 2013).

3. The Dutch banking sector

The current structure of the Dutch banking sector is rooted in the mergers and acquisitions wave of the 1980s. This culminated in fewer but larger banks, and nowadays the sector is one of the most concentrated in Europe (DNB, 2015). The Netherlands Authority for Consumers and Markets (2013) finds that 72.3% of the newly-granted mortgages between January 2012 and October 2012

were granted by the four largest banks. For savings accounts, these four banks had a total market share of 84% in 2011 (Dijsselbloem, 2013) and Gfk (2014) concludes that the total market share of savings accounts of the three largest banks equalled 96% in 2014. Not only is the sector concentrated compared to other European banking systems, relative to GDP it also belongs to the largest European banking sectors with a value of more than four times GDP in 2014 (DNB, 2015).[3]

Although the Dutch banking sector has a relative stable history, the sector has experienced turbulent years during the recent crisis. Only four banks failed between 1945 and 2007 (Scheltema et al., 2010). From then on, the situation changed considerably. In 2008 and 2009 three banks failed (Scheltema et al., 2010), while at the same time two of the largest banks (ING and SNS REAAL) received a capital injection. In addition, the Dutch parts of Fortis Bank and ABN Amro were nationalised in 2008, and in 2013 SNS REAAL was nationalised as well. Given its stable history, but turbulent crisis years, the Netherlands provides a natural setting to study the effect of government interventions. We focus on the nationalisation of Fortis/ABN Amro and the capital injection of ING.[4] Appendix A provides a description of the problems of both banks that resulted in the need for government support.

4. Data and methodology

We use the annual DNB Household Survey (DHS) to collect data on consumers' banking affairs and personal characteristics. The DHS is a continuous Internet-based survey among a representative sample of the Dutch-speaking population in the Netherlands, starting in 1993. The CentERpanel consists of approximately 2,000 households, in which all family members of age 16 and above are invited to complete the survey. The survey covers a wide array of topics like income, housing, health, personal characteristics and psychological concepts.[5] We complement this dataset with bank-level data from De Nederlandsche Bank (DNB), and additional surveys held among the CentERpanel to measure trust.

Each year participants provide the names of the banks where they held their savings and current accounts at the end of the previous year, as well as the balance of each account. In case someone has multiple accounts of the same product, we focus on the most important account. This is the account with the highest balance for the savings account, and the self-reported most important account for the current account.

[3] The average size of banking sectors in the Euro area equaled 3 times GDP in 2014. Only Ireland and Great Britain had a larger banking sector relative to GDP (DNB, 2015).
[4] In case of SNS REAAL, the pre-intervention switching trend is not similar to the control bank and hence a difference-in-difference comparison is problematic. Consequently, we exclude it from our analysis.
[5] See http://www.centerdata.nl/en/projects-by-centerdata/dnb-household-survey-dhs for more information on the DHS. URL last accessed on 22 December 2016. See also Teppa and Vis (2012).

Our research covers the period from 2004 to 2008, which enables us to compare behaviour before and after the interventions. We limit the sample period to 2008 as we are interested in immediate responses to bail-outs. We find that overall respondents mention 51 banks for holding their savings account. We furthermore find that 83% of savings accounts are held at one of the six largest banks.[6] We use this detailed dataset to construct all variables included in the regression analyses before making any restrictions.[7]

For each respondent, we compare their banks in consecutive years to find out whether they changed banks. We define switching as a deliberate choice that requires action. Switching between a parent and subsidiary is defined as a switch as customers have to undertake action to arrange the switch.

In the analyses we restrict the sample to customers of the bailed-out bank in question and a control bank: Rabobank. This is a large bank that did not receive any government support.[8] At the time the nationalisation took place, ABN Amro was acquired by Fortis and hence the aggregate became nationalised. For this reason we include both Fortis' and ABN Amro's customers in the analyses.

Figure 1 shows the evolution of switching for the bailed-out banks and the control bank. The figures show the proportions of customers that switched to another bank in a given year. The top graphs plot switching proportions of Fortis/ABN Amro and Rabobank.[9] The left graph presents switching with the savings account, and the right graph shows switching with the current account. For both banking products, we document a peak in switching in 2008, the year of the intervention. In this year, we observe that customers of the nationalised bank switched more than customers of the control bank. However, the years before reveal that this has been the case for most other years. This graph shows the relevance of using a panel dataset rather than a cross-sectional dataset. Only focusing on the year of the intervention might lead to the incorrect conclusion that the interventions led to switching. The lower graphs plot switching proportions of customers of ING and Rabobank. Again, we note a peak in switching in 2008 and we show that customers of the bailed-out bank switched more than customer of the control banks in all years.

To test whether the switching trends of customers of the control bank and the bailed-out

[6] The six largest banks are: ABN Amro, Fortis, Postbank, ING, Rabobank and SNS REAAL. The brands Postbank and ING merged in 2009, even though they were already part of the same concern. Fortis took over ABN Amro in 2007 and these banks merged in 2010.

[7] We compute all variables using the detailed dataset. Later we use different samples in different specifications.

[8] As ING received capital support on the concern level, its subsidiaries received support as well. A critical assumption here is that consumers are informed about this. When a bank receives support but customers are not aware of this, they will not respond to it. Hence it is key to understand consumers' awareness of interventions. To gain insight in consumers' perceptions, we analyse newspaper articles. These articles mention that ING received a capital injection, but the names of its subsidiary are not mentioned. As a result most consumers were probably not aware that Postbank received support as well. Besides, the problems creating the need for support were at ING and not at Postbank. Consequently, we do not include customers of Postbank in the analyses.

[9] To be consistent with the regression analysis, we plot Fortis and ABN Amro together.

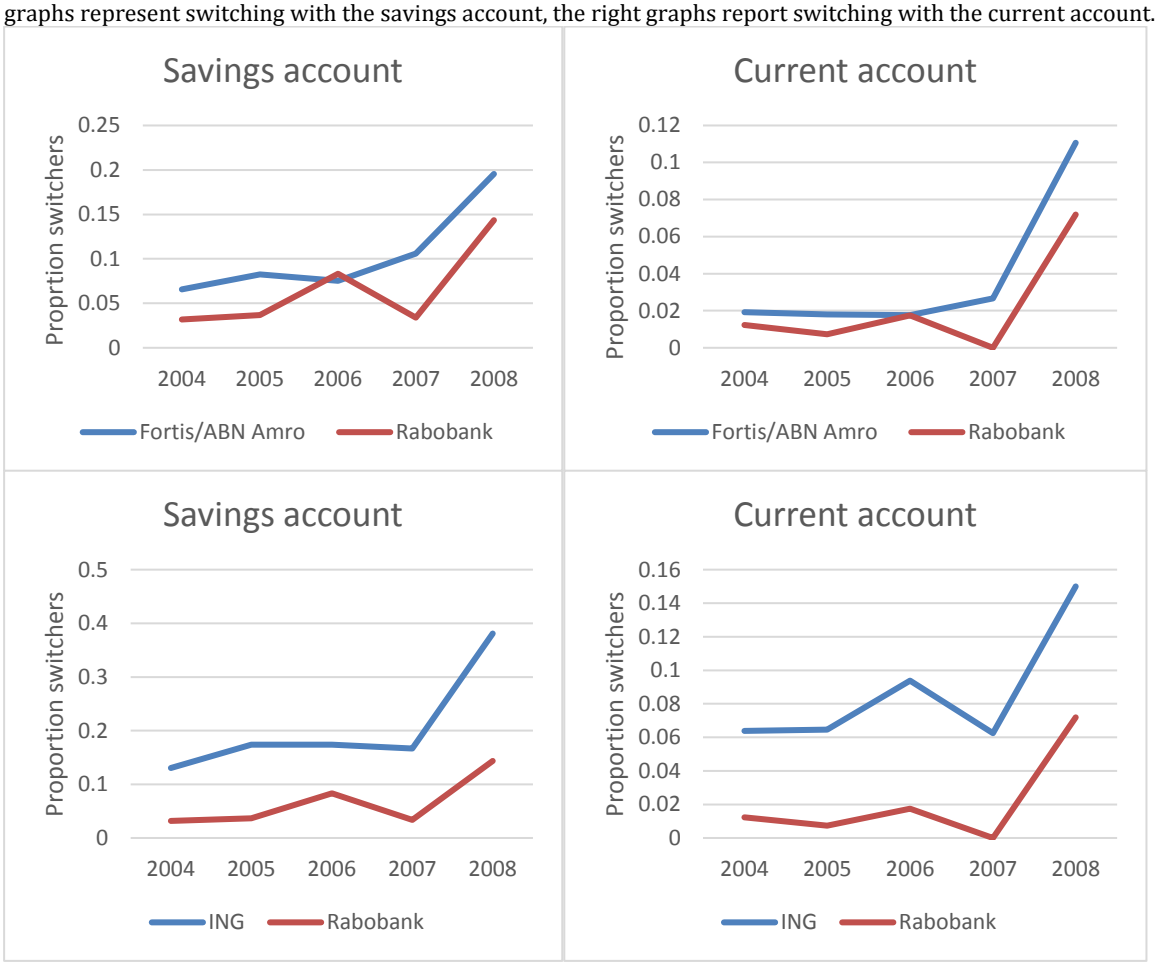
bank are similar before the intervention, we restrict the sample to the pre-intervention period (2004-2007) and run the following regression:

$$Switch_{i,p,t} = \alpha_b + \alpha_t + \beta_1 Bailed\ out_{i,p,t} * D06_t + \beta_2 Bailedout_{i,p,t} * D07_t + \varepsilon_{i,p,t} \quad (1)$$

In this specification, *i* denotes the customer, *b* the bank, *p* the banking product and *t* time in years.

Figure 1: Switching proportions over time by bank

This figure shows the proportion of customers that switched to another bank in a given year. The upper graphs include customers of Fortis/ABN Amro and Rabobank and the lower graphs include customers of ING and Rabobank. The left graphs represent switching with the savings account, the right graphs report switching with the current account.



Source: DNB Household Survey.

Our dependent variable captures whether the customer switched banks in a given year. It is a dummy variable with value 1 if a switch took place and zero otherwise. We regress it on bank dummies, time dummies, as well as interaction terms of a dummy capturing whether the customer is with the bailed-out bank at the beginning of the year (*Bailed-out*) and time dummies (respectively 2006 and 2007). In this setup we focus on switching away from the bank. The standard errors are clustered on the customer level. β_1 (β_2) shows whether customers of the

bailed-out bank switched more or less in 2006 (2007) than in 2004 and 2005. If the trends are parallel, we should find insignificant effects. Table B.1 of Appendix B reports the results and shows insignificant interaction terms for both bailouts and both banking products.

5. The aggregate effect of interventions on switching away from the intervened bank

First, we report the aggregate effect of government interventions on switching away from the intervened bank.

5.1 Methodology

The panel structure of our dataset allows us to compare the behaviour of customers of an intervened bank with the behaviour of customers of the control bank, after versus prior to the troubles and intervention. That is, we apply a difference-in-difference estimator to identify the effect of government interventions on switching behaviour. The advantage of this methodology is that we take systematic differences in the behaviour of customers (consumers) of different banks into account. Figure 1 shows that this is important as the proportion of customers switching banks differs across banks.

We run separate regressions for each banking product and intervention. For all regressions, the sample is restricted to customers of the intervened bank under investigation and Rabobank, the control bank. Rabobank serves as a benchmark to proxy switching behaviour at the treated bank, if there were no problems and an intervention. We estimate the following fixed effects model:

$$Switch_{i,p,t} = \beta_1 D05_t + \beta_2 D06_t + \beta_3 D07_t + \beta_4 D08_t + \beta_5 Bailed\ out_{i,p,t} + \beta_6 Bailed\ out_{i,p,t} D08_t + \beta_7 B_{i,p,t-1} + \alpha_i + \alpha_b + \varepsilon_{i,p,t} \quad (2)$$

Again, *i* denotes the customer, *b* the bank, *p* the banking product and *t* time in years. Our dependent variable captures whether the customer switched banks in a given year.

To capture aggregate time trends we include dummies for each year (*D05-D08*), with 2004 being the reference year. *Bailed-out* captures whether the customer is from the intervened bank. This variable is 1 if the customer is with the mentioned bank at the beginning of year *t* and zero if this is otherwise. Consequently, we focus on switching behaviour of the bank's current customers in a given year.

The coefficient of interest is β_6. It measures the effect of the bail-out on switching. We rely on the identification assumption that customers of bailed-out banks would have behaved like customers of the non-bailed-out bank in the absence of problems and the bail-out. β_6 identifies

whether switching behaviour of customers of an intervened bank, in comparison to customers of the control bank, significantly changed after the intervention.

A concern is that the analysis may suffer from an omitted variable bias, as the customer base could drive both the intervention and switching behaviour. The Dutch government offered liquidity to all healthy and viable banks that were in trouble because of the crisis. Hence, each bank decided whether to make use of this offer. Bank managers are likely to take expected customer responses into account when deciding on this.

We provide summary statistics of savings account holders of each bank at January 1, 2008 to investigate observable differences in customers across banks. We check for each bailed-out bank whether its customers are significantly different from Rabobank's customers in terms of gender, age, education, whether they are responsible for household finances, the degree of urbanisation of their residence and the value of the savings account (Table 1). The average age of the customer is higher for Fortis/ABN Amro than for Rabobank, and Rabobank's customers are less likely to live in urbanised cities. This is not surprising, given the origin of the Rabobank; a cooperative of small agricultural banks. The average value of the savings account is lower at ING than at Rabobank. We find no differences for all other variables. As most of the variables do not change much over time (e.g. gender or education), we include customer fixed effects rather than these control variables. The advantage of this methodology is that it is also captures all time-invariant unobservable characteristics.

Table 1: Comparison of customers of different banks

This table compares savings account holders on January 1, 2008 of different banks. The table shows mean values of customer characteristics. Male is a binary dummy with value 1 if male and 0 otherwise, age measures the age of the respondent in years, education: bachelor degree or higher is a binary dummy with value 1 if having successfully completed higher vocational education and/or university education and zero otherwise. Responsible for household finances equals 1 if responsible for the household's financial affairs and zero otherwise. Degree of urbanisation measures the degree of urbanisation of a respondent's residence based on the address density and ranges from 1 (not urbanised) to 5 (very strongly urbanised). The value of the savings account is denoted in euros. The stars indicate whether the mean is significantly different from the mean value of Rabobank. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Rabobank	Fortis/ABN Amro	ING
Male	0.58	0.57	0.64
Age	51.12	55.00**	52.48
Education: bachelor degree or higher	0.41	0.37	0.36
Responsible for household finances	0.78	0.82	0.72
Degree of urbanisation	2.49	3.40***	3.28***
Value savings account	19,191	19,495	10,733**

Source: DNB Household Survey.

Vector *B* includes bank characteristics of the bank where the customers have the account at the beginning of the year. We control for the bank's size (logarithm of total assets), profitability (return on assets) and interest rates on household savings (see also Soledad Martinez Peria and

Schmukler, 2001; Demirgüç-Kunt and Huizinga, 2004; Hasan et al., 2013). To control for time-invariant bank characteristics we include bank fixed effects. This captures for example the customer orientation of a bank.

We use bank level data from DNB to construct the variables. The upper panel of Table 2 shows total assets in millions. ABN Amro and ING are the largest banks. The second panel of Table 2 highlights the impact of the financial crisis as we observe negative values for profitability in 2008. The lower panel of Table 2 shows the interest rates on household savings. Rabobank and ABN Amro offer the highest interest rates on savings.

We cluster the standard errors at the respondent level. Appendix C provides summary statistics of the variables included in this study.

Table 2: Bank level variables

This table shows the evolution of bank size, profitability and interest rates on household loans per bank. Bank size is measured as the value of total assets in millions. The value of return on asset denotes the profitability. The lower panel shows the average interest rate on household savings. All variables are measured on 31 December of the expressed year.

	2004	2005	2006	2007	2008
	Total Assets in millions				
ABN Amro	615	881	987	1030	664
Fortis	144	170	209	272	184
ING	617	834	895	996	1030
Rabobank	462	507	559	571	614
	Return on Assets (%)				
ABN Amro	0.185	0.147	0.119	0.666	-1.249
Fortis	0.066	0.082	0.061	0.064	-10.435
ING	0.064	0.120	0.103	0.087	-0.097
Rabobank	0.064	0.097	0.087	0.070	0.136
	Interest rates on household savings (%)				
ABN Amro	2.861	2.637	2.607	3.029	3.558
Fortis	2.699	2.267	2.103	2.259	2.630
ING	2.562	2.364	2.294	2.387	2.737
Rabobank	2.782	2.635	2.628	3.040	3.566

Source: DNB.

5.2 Results

Table 3 reports the results of the fixed effects regressions to measure the net effect of each intervention on switching. Note that the bailed-out dummy is included in the bank fixed effect. The first two columns report the results of the nationalisation of Fortis/ABN Amro while the last two columns show the results of the capital injection of ING.

Table 3: Regression results: aggregate effect on switching away from the intervened bank

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched to another bank in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. *D05, D06, D07* and *D08* are year dummies. We consider the period 2004-2008. The first two columns show the results of the nationalisation of Fortis/ABN Amro, the last two columns show the results of the capital injection at ING. In all cases, the sample is restricted to customers of the intervened bank in question and Rabobank. The header of each column denotes the banking product in question. The specifications include bank and customer fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro		ING	
	Savings account	Current account	Savings account	Current account
D05	-0.00	-0.03*	-0.09	-0.06
	(0.030)	(0.015)	(0.248)	(0.185)
D06	0.00	-0.04	0.16	-0.18
	(0.057)	(0.026)	(0.263)	(0.493)
D07	0.01	-0.04	0.02	-0.14
	(0.063)	(0.031)	(0.338)	(0.387)
D08	0.10	0.09*	0.01	0.28
	(0.066)	(0.055)	(0.208)	(0.600)
Bailed-out*D08	-0.05	0.04	0.17	-0.10
	(0.089)	(0.048)	(0.351)	(0.484)
Return on assets	0.15	0.03	-8.15	1.21
	(0.177)	(0.107)	(8.035)	(2.242)
ln(Total Assets)	0.03	-0.05	0.47	-0.58
	(0.136)	(0.112)	(0.677)	(1.526)
Interest rate	-0.04	-0.16	-0.12	-0.91
	(0.125)	(0.102)	(0.925)	(2.438)
Observations	1,781	3,328	1,226	2,309
Within R-squared	0.04	0.09	0.09	0.05
Bank fixed effects	YES	YES	YES	YES
Customer fixed effects	YES	YES	YES	YES

We find a positive and significant coefficient for the year 2008 in the current account specification of the nationalisation of Fortis/ABN Amro. Hence, the proportion of switchers was higher in 2008 than in 2004, indicating a crisis effect. However, the insignificant interaction terms for both the savings account and current account imply that customers of the nationalised bank did not switch away more after the bank's problems and the intervention than they did in prior years, compared to customers of the control bank. Focusing on the capital injection of ING, the coefficient of the 2008 dummy is insignificant in both specifications and, again, we find insignificant interaction terms.

Hence the outflow of consumers at the intervened banks remained unchanged after the troubles and government intervention, relative to the control bank. This is in contrast to findings of Brown et al. (2016) who show that customers of a bailed-out bank are more likely to withdraw from and terminate the account. There are two possible explanations. Either the difference in results stems from differences in the methodology as they use a cross-sectional dataset rather

than a panel dataset, or Swiss consumers respond differently to a capital injection than Dutch consumers.

To formally test which explanation holds, we run a cross-sectional regression which is similar to Brown et al. (2016). We do this for each intervention and banking product separately:

$$Switch_{i,p} = \alpha + \beta_1 Bailed\ out_{i,p} + \gamma C_{i+} + \varepsilon_{i,p} \quad (3)$$

Vector *C* includes observable consumer characteristics: gender, education, age dummies, income dummies, responsible for household finances, degree of urbanisation, risk aversion and the value of the most important savings account as a proxy for wealth (see Appendix C for definitions and summary statistics). β_1 shows whether customers of the bailed-out bank are more likely to switch away in 2008 than customers of the control bank. Appendix D presents the results. Without taking systematic differences across customers of different banks into account, we find that customers of bailed-out bank are 7 percentage points more likely to switch away with their current account after a nationalisation than customers of the control bank. In addition, savings account holders are also more likely to switch away after a capital injection. Hence, using a cross-sectional setup, half of our findings are in line with those of Brown et al. (2016). We do not find an effect of the bail-out for savings account holders after the nationalisation, nor for current account holders after a capital injection. As a result we conclude that the differences between our main results and Brown et al. (2016) partially stem from differences in methodology and partly from differences in behaviour of Swiss and Dutch customers. This finding again stresses the importance of taking systematic differences of customers across banks into account.

6. Exploring heterogeneity across bank customers

Even though we do not find an aggregate change in switching behaviour after the bail-outs, some customers might be more inclined to respond to interventions than others. We research whether responses depend on consumers' level of risk aversion and trust in the government. Regarding the first type of heterogeneity, if customers are well-informed about risks an intervention should especially prevent the outflow of risk-averse customers because of the lower default risk. On the other hand, the interventions may make customers more aware of the risks at the bank and trigger instead an outflow of risk-averse customers. Concerning the second type of heterogeneity, the effect of the nationalisation may depend on customer's level of trust in the government. We expect that customers with little or no trust in the government are more likely to leave a nationalised bank than customers who trust the government. We only expect trust in the government to affect switching after a nationalisation as the government does not become the new owner of the bank after a capital injection.

6.1 Methodology

To measure trust in the government, we use data of trust surveys held in March 2007 and March 2008. Respondents indicated their trust in national politics and civil service, ranging from 1 (a lot of trust) to 4 (no trust at all). We first compute the average trust in national politics and civil service. Based on this, we construct a dummy variable, *Lack of trust*, which has value 1 if the average level of trust is equal to or greater than 3 and zero otherwise. For each individual we have one value of lack of trust. We estimate the following regression and are interested in the triple interaction term, β_{10}:

$$Switch_{i,b,t} = \beta_1 D05_t + \beta_2 D06_t + \beta_3 D07_t + \beta_4 D08_t + \beta_5 Bailed\text{-}out_{i,p,t} + \beta_6 Lack\ of\ trust_i + \beta_7 Bailed\text{-}out_{i,p,t} * D08_t + \beta_8 Lack\ of\ trust_i * D08_t + \beta_9 Lack\ of\ trust_i * Bailed\text{-}out_{i,p,t} + \beta_{10} Bailed\text{-}out_{i,p,t} * Lack\ of\ trust_i * D08_t + \beta_{11} B_{i,p,t-1} + \alpha_i + \alpha_b + \varepsilon_{i,p,t} \quad (4)$$

To measure a consumer's level of risk aversion we focus on direct statements on investment strategies. Respondents indicate to what extent they agree with the following statements ranging from 1(complete disagreement) to 7 (complete agreement): *1) 'I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns.', 2) 'I do not invest in shares, because I find this too risky.', 3) 'If I think an investment will be profitable, I am prepared to borrow money to make this investment.', 4) 'I want to be certain that my investments are safe.', 5) 'If I want to improve my financial position, I should take financial risks.', and 6) 'I am prepared to take the risk to lose money, when there is also a chance to gain money.'*. We recode the statements such that a higher value implies a higher value of risk aversion. As in Kapteyn and Teppa (2011) we apply a factor analysis to determine the factor. Based on this we construct the dummy variable *Risk aversion* which is equal to one if one is above the median and zero otherwise.

We run the following regression to examine the role of risk aversion:

$$Switch_{i,p,t} = \beta_1 D05_t + \beta_2 D06_t + \beta_3 D07_t + \beta_4 D08_t + \beta_5 Bailed\text{-}out_{i,p,t} + \beta_6 Risk\ aversion_{i,t} + \beta_7 Bailed\text{-}out_{i,p,t} * D08_t + \beta_8 Risk\ aversion_{i,t} * D08_t + \beta_9 Risk\ aversion_{i,t} * Bailed\text{-}out_{i,p,t} + \beta_{10} Bailed\text{-}out_{i,p,t} * Risk\ aversion_{i,t} * D08_t + \beta_{11} B_{i,p,t-1} + \alpha_i + \alpha_b + \varepsilon_{i,p,t} \quad (5)$$

The notation is similar as before and we include the same bank control variables and fixed effects. Standard errors are again clustered at the customer level.

We are especially interested in the coefficient of the triple interaction term, β_{10}. It shows whether risk averse and non-risk averse customers respond differently to the bail-out relative to customers of the control bank.

6.2 Main results

We find that, compared to customers that trust the government, customers with lower levels of trust in the government are more likely to switch away after a nationalisation, relative to customers of the control bank (Table 4, column 1 and 2). Both in the specification of the savings account and the specification of the current account, we find a positive and significant triple interaction term. As the marginal effects are respectively 18 percentage points and 14 percentage points these effects are also economically significant. These findings have important implications for designing government interventions. Although the goal of an intervention is to secure trust and stability in the sector, the opposite will occur when a large proportion of consumers do not trust the government.

Compared to others, risk averse customers are 18 percentage points more likely to switch away after a nationalisation, relative to the behaviour of customers of the control bank (Table 4, column 3 and 4). The effect is significant for the current account. This finding indicates interventions may make consumers better aware of the financial troubles their bank faces.

Continuing with the capital injection of ING, we do not find differences in switching the savings account between customers with high and low levels of trust in the government. In contrast, for the current account we find that, in comparison with customers that trust the government, customers with no or little trust in the government are more likely to stay at the intervened bank relative to the control bank. Moreover, we find no differences in switching behaviour of customers with different level of risk aversion.

Our findings not only show the roles of lack of trust in the government and the level of risk aversion, they also indicate that consumers respond differently to a nationalisation and a capital injection. Besides, they show that consumer responses depend on the banking product in question.

Table 4: Exploring heterogeneity: The role of lack of trust in the government and risk aversion

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched banks in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. *D05, D06, D07* and *D08* are year dummies. *Lack of trust* and *Risk* aversion are binary variables capturing whether the customer has respectively low trust in the government and a high level of risk aversion. We consider the period 2004-2008. The first four columns show the results for the nationalisation and the last four columns show the results for the capital injection. The header of each column denotes the banking product in question. In all cases, the sample is restricted to customers of the intervened bank studied and Rabobank. The specifications include bank fixed effects, customer fixed effects and bank controls. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro				ING			
	Savings account	Current account	Savings account	Current account	Savings account	Current account	Savings account	Current account
D05	-0.01	-0.02	0.00	-0.02	-0.17	-0.10	-0.13	0.04
	(0.030)	(0.014)	(0.033)	(0.015)	(0.242)	(0.180)	(0.303)	(0.176)
D06	-0.01	-0.03	0.02	-0.03	0.10	-0.29	0.06	-0.01
	(0.057)	(0.026)	(0.063)	(0.027)	(0.251)	(0.483)	(0.301)	(0.482)
D07	0.00	-0.03	0.03	-0.04	-0.08	-0.23	-0.06	0.02
	(0.063)	(0.031)	(0.071)	(0.033)	(0.322)	(0.378)	(0.406)	(0.368)
D08	0.11	0.14**	0.10	0.10	-0.05	0.42	0.06	0.26
	(0.073)	(0.060)	(0.076)	(0.067)	(0.217)	(0.597)	(0.223)	(0.631)
Bailed-out*D08	-0.17**	-0.01	-0.14	-0.05	0.11	-0.09	0.12	0.06
	(0.083)	(0.052)	(0.154)	(0.066)	(0.350)	(0.476)	(0.469)	(0.482)
Lack of trust*D08	-0.03	-0.04			-0.01	-0.03		
	(0.052)	(0.028)			(0.051)	(0.027)		
Lack of trust*Bailed-out	-0.05	-0.00			0.81*	0.09		
	(0.256)	(0.575)			(0.416)	(0.732)		
Lack of trust*Bailed-out*D08	0.18*	0.14***			-0.05	-0.24**		
	(0.095)	(0.054)			(0.268)	(0.106)		
Risk aversion*D08			-0.05	-0.04			0.01	-0.04
			(0.057)	(0.028)			(0.055)	(0.027)
Risk aversion*Bailed-out			0.04	-0.00			0.10	0.09
			(0.038)	(0.014)			(0.155)	(0.068)
Risk aversion*Bailed-out*D08			0.17	0.18***			-0.17	0.03
			(0.111)	(0.058)			(0.289)	(0.135)
Observations	1,625	2,978	1,595	2,800	1,122	2,077	1,106	1,935
Within R-squared	0.05	0.09	0.06	0.13	0.11	0.07	0.09	0.07
Customer fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank controls	YES	YES	YES	YES	YES	YES	YES	YES

6.3 Additional results

To now we have focused on one way of switching: switching *away* by existing customers. In an additional test we investigate switching *to* bailed-out banks. The regression equation is similar to equation 2 except that we include lagged bank control variables of the bank the customer is with at the end of the year. Besides, the sample is different. Now we focus on customers of the bailed-out and the control bank at the end of the year. The bailed-out indicator is equal to one if one is customer of an intervened bank at year end. Hence, β_6 captures whether respondents are more likely to switch to an intervened bank than to the control bank, relative to the period before. In none of the specifications do we find a significant net effect (see Table E.1 in Appendix E). Second, we do not find an effect of risk aversion or lack of trust in the government (see Table E.2 in Appendix E). Consequently we conclude that the interventions do not trigger switches towards the intervened bank.

We now examine switching immediately after the intervention. If consumers panic, they will respond immediately. In an additional test, we prolong the sample period with one year. We extend the net effect specifications with a year dummy for 2009 and an interaction term of the bailed-out dummy and the 2009 dummy. We exclude respondents who switched to the bank in question after the intervention: customers who had an account on 1 January 2009 at the bailed-out bank or control bank, but not on 1 January 2008. Studying the responses to the nationalisation, we again find an insignificant interaction term for 2008 for the savings account (see Table E.3 in Appendix E). The interaction term with the 2009 dummy is positive and significant at the 10% level. Regarding the current account, we now find a positive and significant interaction term for 2008 (significant at the 10% level). Based on this, we conclude that if anything, consumers are more likely to switch away after a nationalisation. We do not find a net effect for 2008 nor 2009 on switching after the capital injection of ING.

Table E.4 in Appendix E presents the findings of the role of risk aversion and lack of trust in the government for the extended sample period. The triple interaction of lack of trust in the government, the bail-out indicator and the 2008 dummy remain significant for both specifications of the nationalisation. This indicates again that customers with less trust in the government are more likely to switch away after a nationalisation relative to customers of the control bank. The marginal effects have a similar magnitude as in our baseline analyses (16 percentage points and 13 percentage points). We do not find a role for trust in the government for 2009. Neither in case of a nationalisation, nor in case of a capital injection, irrespective of the banking product in question. The positive effect of risk aversion on switching with the current account after a nationalisation is confirmed. The triple interaction is with a magnitude of 15 percentage points also economically relevant. Risk aversion has an immediate effect as we only find differences in switching behaviour across individuals with different levels of risk aversion in 2008. Looking at

consumer responses to a capital injection, we again find a negative effect of lack of trust in the government on switching the current account in 2008. We do not find an effect of risk aversion or lack of trust in the government in 2009.

Lastly, we conduct an additional analysis in which we include bank-time fixed effects when exploring heterogeneity across bank customers for the original sample period. This way we control for all time-varying bank characteristics and hence this specification is stricter than our baseline regression. Table E.5 in Appendix E shows that the results for risk aversion and lack of trust in the government are both quantitatively and qualitatively similar to the results in Table 5.

7. Conclusion

The aim of this study is to investigate the effect of government interventions at banks on consumer switching behaviour. Although the goal of bail-out operations is clear, the consequences are not evident. If customers respond rationally to interventions and are well-informed about bank risk they will be more likely to stay after an intervention, given that default risk is reduced. On the other hand, customers may be unaware of the risks or there might be other reasons which encourage customers to switch away from the bank.

We are the first to exploit a panel dataset which allows us to employ a difference-in-difference analysis. This way we are able to control for systematic differences across customers of banks. We distinguish between a nationalisation and a capital injection to gain insight in the importance of the scope of the intervention, which is novel in the switching literature. Moreover, we analyse switching with the savings and current account separately as prior research shows that both switching propensities and the main factors related to switching depend on the banking product (Van der Cruijsen and Diepstraten, 2015).

We find that the aggregate switching behaviour of consumers at intervened banks is similar before and after the intervention. This holds for both type of interventions and banking products. Second, we show heterogeneity in consumer responses to government interventions. Compared to consumers who trust the government, consumers with no or little trust in the government are more likely to switch away after a nationalisation (relative to the control bank). This holds for both the savings account and current account. In addition, we show that, compared to others, risk-averse consumers are more likely to switch away after a nationalisation, relative to customers of the control bank. This indicates that a nationalisation can make consumers better aware of the financial problems the bank experienced.

These results yield important policy implications. Although the goal of a nationalisation is to secure trust and stability in the system, the opposite will occur when a large proportion of customers does not trust the government, or is risk averse and the nationalisation makes them more aware of the troubles at their bank.

Last, our results also imply that consumer responses depend on both the banking product and the type of intervention. Compared to consumers who trust the government, consumers with no or little trust in the government are more likely to stay at the bank with the current account when the bank receives a capital injection (in comparison to customers of the control bank).

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Appendix A: The need for government interventions

This appendix provides a short description of the problems of each bank that resulted in their need for government support in 2008. This description is based on research conducted by the Parliamentary Inquiry Committee Financial System (2012).

In 2007, a consortium of three banks – Royal Bank of Scotland, Fortis and Santander – acquired ABN AMRO. As the part taken over by Fortis was undercapitalized, it needed capitalization before it could be integrated with Fortis. However, because of the drying-up of the interbank market, Fortis had funding problems. At the same time, the operational performance of Fortis was under pressure due to worsening market conditions. Fortis entered a vicious circle leading to a drop in trust, which in turn resulted in withdrawals of institutional customers.[10] Taken all together, the combination of worsening market conditions and the integration process created the need for government support. After exploring other solutions, the government took over all Dutch Fortis parts on 3 October 2008. On 21 November 2008, the minister of Finance declared that Fortis Bank Nederland and the part of ABN Amro would be integrated into a single bank. The two banks merged in July 2010.

A few days after the nationalisation, the Dutch government announced it had earmarked EUR 20 billion for healthy and viable banks and insurance companies that were in trouble because of the financial crisis. ING was the first to make use of this offer and received 10 billion Euro on 19 October 2008 in Core Tier 1 securities. ING's problems arose at ING Direct USA, a consumer bank without physical offices. US regulation required ING to invest at least 65% of savings in consumer credit and ING achieved this by investing in mortgages and residential mortgage backed securities. The largest part of the mortgage bonds were Alt-A mortgage bonds, which are at the heart of the problems. After the US mortgage bubble burst, market analysts started to question ING's Alt-A portfolio, and even though the credit losses on the portfolio were limited, ING had to record losses for accounting reasons. Trust in the market for Alt-A products declined and after the collapse of Lehman Brothers, people realized that banks are able to default. This led to a decrease of the market's trust in ING, causing a drop in ING's share price. ING also suffered losses on the investments made by the insurance arm of the bank. On October 19, the Dutch government agreed to buy core tier 1 securities worth 10 billion Euro. However, this capital injection did not solve the problems and as a result the minister of Finance and ING signed the Illiquid Back-Up Facility on 26 January 2009 to arrange the takeover of 80% of Alt-A portfolio by the government and from 30 January 2009 onwards ING participated in a guarantee.

[10] Withdrawals were from institutional clients rather than from private individuals.

For each of the aforementioned government interventions, the intervention was not a response to households switching their accounts. Hence there is no reverse causality. The problems at the banks were unrelated to the domestic retail banking operations.

Appendix B: Pre-intervention switching trends

Table B.1: Pre-intervention switching trends

This table shows the estimates of a fixed effects model to test whether the pre-intervention switching trends of the treated and control bank were similar. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched banks in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. *D05, D06* and *D07* are year dummies. The first two columns show the results for Fortis/ABN Amro and the last two columns show the results for ING. In all cases, the sample is restricted to customers of the intervened bank in question and Rabobank. The header of each column denotes the banking product in question. The specifications include bank fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro		ING	
	Savings account	Current account	Savings account	Current account
D05	0.01	-0.00	0.01	-0.00
	(0.015)	(0.006)	(0.019)	(0.008)
D06	0.05**	0.01	0.05**	0.01
	(0.022)	(0.008)	(0.023)	(0.009)
D07	0.00	-0.01**	0.00	-0.01**
	(0.014)	(0.005)	(0.015)	(0.006)
Bailed-out*D06	-0.05	-0.01	-0.03	0.02
	(0.034)	(0.013)	(0.085)	(0.059)
Bailed-out*D07	0.03	0.02	0.02	0.01
	(0.033)	(0.012)	(0.078)	(0.045)
Observations	1,432	2,653	989	1,838
Bank dummies	YES	YES	YES	YES
Within R-squared	0.01	0.01	0.03	0.02

Appendix C. Description and summary statistics of variables

Table C.1: Description and summary statistics of variables (I/II)

This table reports the number of observations (N), mean, standard deviation (sd), minimum (min), and maximum (max) of the variables used in this study. [a] includes all observations used in the aggregate effects specification for the savings account (column 1 and 3 in Table 3). [b] includes all observations used in the aggregate effects specification for the current account (column 2 and 4 in Table 3). [c] includes all observations used in the aggregate effects specification for the nationalisation of Fortis/ABN Amro (column 1 and 2 in Table 3). [d] includes all observations used in the aggregate effects specification for the capital injection of ING (column 3 and 4 in Table 3). [e] includes all observations in the aggregate effects specifications (column 1, 2, 3 and 4 in Table 3). [f] includes all observations of the heterogeneity specifications studying the effect of lack of trust in the government (column 1, 2, 5 and 6 in Table 4). [g] includes all observations of the heterogeneity specifications studying the effect of risk aversion (column 3, 4, 7 and 8 in Table 4). [h] includes the observations in the cross-sectional analyses (Table D.1 in the Appendix). [i] includes one observation per bank-year of the banks used in this study.

Variable	Description	N	Mean	Sd	Min	Max
Switch dummies						
Switch savings account	Binary dummy (1 = switched savings account in this year, 0 = else).	1901[a]	0.088	0.283	0	1
Switch current account	Binary dummy (1 = switched current account in this year, 0 = else).	3526[b]	0.031	0.174	0	1
Bail out dummies						
Fortis/ABN Amro	Binary dummy (1 = savings or current account holder of ABN Amro/Fortis, 0 = Rabobank).	3617[c]	0.371	0.483	0	1
ING	Binary dummy (1 = savings or current account holder of ING, 0 = Rabobank).	2556[d]	0.099	0.298	0	1
Year dummies						
D04	Binary dummy (1 = 2004, 0 = otherwise).	3850[e]	0.204	0.403	0	1
D05	Binary dummy (1 = 2005, 0 = otherwise).	3850[e]	0.189	0.391	0	1
D06	Binary dummy (1 = 2006, 0 = otherwise).	3850[e]	0.188	0.391	0	1
D07	Binary dummy (1 = 2007, 0 = otherwise).	3850[e]	0.217	0.412	0	1
D08	Binary dummy (1 = 2008, 0 = otherwise).	3850[e]	0.203	0.402	0	1
Customer characteristics (I/II)						
Lack of trust	Binary dummy (1= low level of average trust in national politics and civil service, 0 otherwise)	3460[f]	0.534	0.499	0	1
Risk aversion	Binary dummy (1 = above median value of risk aversion factor, 0 = otherwise).	3273[g]	0.498	0.500	0	1
Male	Binary dummy (1= male, 0 otherwise)	435[h]	0.614	0.487	0	1
Education: bachelor degree or higher	Binary dummy (1 = successful completion of higher vocational education and/or university education 0 = otherwise).	435[h]	0.398	0.490	0	1
Age 35-44	Binary dummy (1= between 35 and 44, 0=otherwise).	435[h]	0.154	0.361	0	1
Age 45-54	Binary dummy (1= between 45 and 54, 0=otherwise).	435[h]	0.159	0.366	0	1
Age 55-64	Binary dummy (1= between 55 and 64, 0=otherwise).	435[h]	0.264	0.442	0	1
Age 65 plus	Binary dummy (1= 65 or older, 0=otherwise).	435[h]	0.278	0.449	0	1

Table C.1: Description and summary statistics of variables (II/II)

This table reports the number of observations (N), mean, standard deviation (sd), minimum (min), and maximum (max) of the variables used in this study. [a] includes all observations used in the aggregate effects specification for the savings account (column 1 and 3 in Table 3). [b] includes all observations used in the aggregate effects specification for the current account (column 2 and 4 in Table 3). [c] includes all observations used in the aggregate effects specification for the nationalisation of Fortis/ABN Amro (column 1 and 2 in Table 3). [d] includes all observations used in the aggregate effects specification for the capital injection of ING (column 3 and 4 in Table 3). [e] includes all observations in the aggregate effects specifications (column 1, 2, 3 and 4 in Table 3). [f] includes all observations of the heterogeneity specifications studying the effect of lack of trust in the government (column 1, 2, 5 and 6 in Table 4). [g] includes all observations of the heterogeneity specifications studying the effect of risk aversion (column 3, 4, 7 and 8 in Table 4). [h] includes the observations in the cross-sectional analyses (Table D.1 in the Appendix). [i] includes one observation per bank-year of the banks used in this study.

Variable	Description	N	Mean	Sd	Min	Max
Customer characteristics (II/II)						
Income 10-20	Binary dummy (1=gross income in euros between 10,000 and 20,000, 0=otherwise).	435[h]	0.136	0.343	0	1
Income 20-30	Binary dummy (1=gross income in euros between 20,000 and 30,000, 0=otherwise).	435[h]	0.205	0.404	0	1
Income 30-40	Binary dummy (1=gross income in euros between 30,000 and 40,000, 0=otherwise).	435[h]	0.214	0.410	0	1
Income > 40	Binary dummy (1= gross income in euros 40,000 or more, 0=otherwise).	435[h]	0.326	0.469	0	1
Responsible for household finances	Binary dummy (1= responsible for household's financial affairs, 0=otherwise).	435[h]	0.828	0.378	0	1
Degree of urbanisation	Degree of urbanisation of respondent's residence based on the address density per km^2 (1 = 500 or less, 2 = 500-1000, 3 = 1000-1500, 4 = 1500-2500, 5 = more than 2500).	435[h]	2.931	1.299	1	5
Factor risk aversion	Factor of risk aversion based on the following statements: 1) 'I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns.', 2) 'I do not invest in shares, because I find this too risky.', 3) 'If I think an investment will be profitable, I am prepared to borrow money to make this investment.', 4) 'I want to be certain that my investments are safe.', 5) 'If I want to improve my financial position, I should take financial risks.', and 6) 'I am prepared to take the risk to lose money, when there is also a chance to gain money.'.	435[h]	-0.008	0.959	-2.906	1.612
Value savings account	Value of the savings account in euros	435[h]	19793.490	32386.780	0	250000
Bank level variables						
Bank size	Value of the logarithm of total assets	20[i]	19.982	0.672	18.552	20.753
Return on assets	Value of net income to total assets (*100%)	20[i]	0.126	0.132	0.061	0.666
Interest rate	Average interest rates on household loans in a year (*100%)	20[i]	2.641	0.294	2.103	3.081

Appendix D: Cross-sectional regression results

Table D.1: Cross-sectional regression results

This table shows the estimates of a cross-sectional regression analysis, including observations of 2008. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched to another bank. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. The first two columns show the results of the nationalisation of Fortis/ABN Amro, the last two columns show the results of the capital injection at ING. In all cases, the sample is restricted to customers of the intervened bank in question and Rabobank. The header of each column denotes the banking product in question. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro		ING	
	Savings account	Current account	Savings account	Current account
Bailed-out	0.05	0.07**	0.27**	0.14
	(0.047)	(0.035)	(0.130)	(0.090)
Male	-0.03	0.05	-0.04	0.04
	(0.053)	(0.036)	(0.061)	(0.047)
Education: bachelor degree or higher	0.01	0.10**	0.01	0.07*
	(0.050)	(0.042)	(0.056)	(0.044)
Age 35-44	-0.13*	-0.01	-0.15*	-0.07
	(0.070)	(0.051)	(0.086)	(0.062)
Age 45-54	-0.05	0.05	-0.11	-0.05
	(0.084)	(0.064)	(0.090)	(0.072)
Age 55-64	0.01	0.06	0.02	-0.01
	(0.080)	(0.059)	(0.096)	(0.071)
Age 65 plus	0.00	0.03	-0.04	-0.03
	(0.077)	(0.059)	(0.088)	(0.075)
Income 10-20	-0.01	-0.05	-0.00	-0.00
	(0.086)	(0.060)	(0.095)	(0.076)
Income 20-30	0.03	0.03	0.08	0.01
	(0.088)	(0.066)	(0.105)	(0.079)
Income 30-40	0.01	-0.06	0.10	0.00
	(0.090)	(0.065)	(0.106)	(0.082)
Income > 40	0.04	-0.10	0.16	-0.09
	(0.092)	(0.070)	(0.110)	(0.080)
Responsible for household finances	0.06	-0.05	0.07	-0.03
	(0.063)	(0.047)	(0.074)	(0.053)
Degree of urbanisation	-0.01	-0.00	-0.01	-0.00
	(0.015)	(0.013)	(0.018)	(0.014)
Factor risk aversion	-0.01	0.03*	0.02	0.01
	(0.025)	(0.016)	(0.028)	(0.018)
Value savings account	-0.00	0.00	-0.00	0.00
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.13	0.06	0.10	0.08
	(0.081)	(0.054)	(0.082)	(0.061)
Observations	298	358	199	243
R-squared	0.03	0.08	0.09	0.07

Appendix E. Additional regression results

Table E.1: Switching *to* intervened banks – aggregate effect

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched to the bank in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the end of the year. *D05, D06, D07* and *D08* are year dummies. We consider the period 2004-2008. The first two columns show the results of the nationalisation of Fortis/ABN Amro, the last two columns show the results of the capital injection at ING. In all cases, the sample is restricted to customers of the intervened bank in question and Rabobank. The header of each column denotes the banking product in question. The specifications include bank and customer fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro		ING	
	Savings account	Current account	Savings account	Current account
D05	-0.00	0.00	0.22	0.03
	(0.029)	(0.011)	(0.289)	(0.081)
D06	-0.01	-0.00	0.02	0.04
	(0.047)	(0.017)	(0.201)	(0.093)
D07	0.03	-0.00	0.22	0.06
	(0.061)	(0.022)	(0.385)	(0.131)
D08	-0.00	-0.00	0.36	0.05
	(0.061)	(0.023)	(0.559)	(0.141)
Bailed-out*D08	0.07	0.02	0.17	0.08
	(0.090)	(0.019)	(0.147)	(0.081)
Return on assets	-0.09	0.04	7.70	-0.04
	(0.170)	(0.041)	(8.255)	(0.325)
ln(Total Assets)	-0.15	-0.04	-1.70	-0.21
	(0.150)	(0.056)	(2.086)	(0.579)
Interest rate	1.29	2.54	32.38	1.23
	(3.957)	(1.629)	(39.220)	(13.261)
Observations	1,777	3,320	1,258	2,456
Within R-squared	0.01	0.04	0.03	0.10
Bank fixed effects	YES	YES	YES	YES
Customer fixed effects	YES	YES	YES	YES

Table E.2: Switching *to* intervened banks – exploring heterogeneity

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched to the bank in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the end of the year. *D05, D06, D07* and *D08* are year dummies. *Lack of trust* and *Risk* aversion are binary variables capturing whether the customer has respectively low trust in the government and a high level of risk aversion. We consider the period 2004-2008. The first four columns show the results for the nationalisation and the last four columns show the results for the capital injection. The header of each column denotes the banking product in question. In all cases, the sample is restricted to customers of the intervened bank studied and Rabobank. The specifications include bank fixed effects and customer fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro				ING			
	Savings account	Current account	Savings account	Current account	Savings account	Current account	Savings account	Current account
D05	-0.00	0.00	-0.01	-0.00	0.23	0.02	0.05	-0.00
	(0.030)	(0.011)	(0.033)	(0.009)	(0.288)	(0.081)	(0.372)	(0.011)
D06	-0.01	-0.00	-0.02	-0.00	0.02	0.04	0.05	-0.01
	(0.049)	(0.016)	(0.054)	(0.014)	(0.199)	(0.093)	(0.269)	(0.014)
D07	0.02	0.00	0.01	-0.01	0.22	0.06	0.07	-0.00
	(0.063)	(0.022)	(0.070)	(0.013)	(0.382)	(0.131)	(0.514)	(0.016)
D08	0.00	0.00	-0.00	-0.03	0.39	0.05	0.07	-0.03
	(0.067)	(0.024)	(0.072)	(0.021)	(0.558)	(0.138)	(0.708)	(0.022)
Bailed-out*D08	0.07	0.03	0.03	0.05	0.10	0.17*	0.18	-0.03
	(0.095)	(0.021)	(0.139)	(0.044)	(0.123)	(0.094)	(0.197)	(0.033)
Lack of trust*D08	-0.02	-0.00			-0.04	-0.01		
	(0.038)	(0.017)			(0.037)	(0.013)		
Lack of trust*Bailed-out	-0.03	-0.18			-0.10	0.58**		
	(0.262)	(0.408)			(0.383)	(0.290)		
Lack of trust*Bailed-out*D08	-0.07	-0.02			0.13	-0.16		
	(0.079)	(0.026)			(0.269)	(0.101)		
Risk aversion*D08			-0.04	0.05**			-0.07	0.01
			(0.042)	(0.026)			(0.041)	(0.019)
Risk aversion*Bailed-out			0.01	-0.01			0.21*	0.01
			(0.038)	(0.022)			(0.120)	(0.025)
Risk aversion*Bailed-out*D08			0.05	-0.08			-0.31	0.18
			(0.097)	(0.050)			(0.266)	(0.115)
Observations	1,617	2,975	1,590	1,790	1,147	2,211	1,136	1,298
Within R-squared	0.02	0.04	0.02	0.13	0.04	0.13	0.06	0.23
Customer fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank controls	YES	YES	YES	YES	YES	YES	YES	YES

Table E.3: The net effect of government interventions on switching – extended sample period

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether the customer switched to another bank in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. *D05, D06, D07*, *D08* and *D09* are year dummies. We consider the period 2004-2009. The first two columns show the results of the nationalisation of Fortis/ABN Amro, the last two columns show the results of the capital injection at ING. In all cases, the sample is restricted to customers of the intervened bank in question and Rabobank. We exclude respondents who had an account at the intervened bank in question or Rabobank at 01-01-2009 but not at 01-01-2008. The header of each column denotes the banking product in question. The specifications include bank and customer fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro		ING	
	Savings account	Current account	Savings account	Current account
D05	0.01	-0.02	-0.14	-0.04
	(0.025)	(0.017)	(0.236)	(0.182)
D06	0.03	-0.02	0.15	-0.12
	(0.045)	(0.030)	(0.256)	(0.484)
D07	0.03	-0.02	-0.03	-0.09
	(0.051)	(0.030)	(0.329)	(0.380)
D08	0.09	0.09***	-0.04	0.21
	(0.064)	(0.028)	(0.217)	(0.595)
D09	0.01	0.14*	0.62	0.55
	(0.124)	(0.072)	(0.711)	(1.942)
Bailed-out*D08	0.01	0.05*	0.13	-0.06
	(0.051)	(0.027)	(0.337)	(0.477)
Bailed-out*D09	0.17*	0.01	-2.51	-0.01
	(0.092)	(0.034)	(2.225)	(0.348)
Return on assets	0.01*	0.00	-9.87	0.89
	(0.007)	(0.006)	(7.662)	(2.225)
ln(Total Assets)	0.05	-0.06	0.62	-0.43
	(0.133)	(0.054)	(0.694)	(1.516)
Interest rate	0.03	-0.13	-0.22	-0.64
	(0.125)	(0.093)	(0.857)	(2.403)
Observations	2,099	3,914	1,487	2,854
Within R-squared	0.04	0.07	0.07	0.04
Bank fixed effects	YES	YES	YES	YES
Customer fixed effects	YES	YES	YES	YES

Table E.4: Exploring heterogeneity across bank customers – extended sample period

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether switched to another banks in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. *D05, D06, D07, D08* and *D09* are year dummies. *Lack of trust* and *Risk* aversion are binary variables capturing whether the customer has respectively low trust in the government and a high level of risk aversion. We consider the period 2004-2009. The first four columns show the results for the nationalisation and the last four columns show the results for the capital injection. The header of each column denotes the banking product in question. In all cases, the sample is restricted to customers of the intervened bank studied and Rabobank. We exclude respondents who had an account at the intervened bank in question or Rabobank at 01-01-2009 but not at 01-01-2008. The specifications include bank fixed effects and customer fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro				ING			
	Savings account	Current account	Savings account	Current account	Savings account	Current account	Savings account	Current account
Bailed-out*D08	-0.07	-0.03	-0.03	-0.03	0.09	-0.07	0.07	0.04
	(0.057)	(0.034)	(0.066)	(0.031)	(0.346)	(0.468)	(0.451)	(0.478)
Bailed-out*D09	0.16	0.01	0.19	0.02	-2.96	-0.03	-2.43	0.22
	(0.112)	(0.041)	(0.121)	(0.045)	(2.362)	(0.347)	(2.603)	(0.340)
Lack of trust*Bailed-out	-0.05	-0.15			0.82**	0.56		
	(0.252)	(0.370)			(0.323)	(0.588)		
Lack of trust*D08	-0.02	-0.04			0.00	-0.03		
	(0.050)	(0.027)			(0.049)	(0.027)		
Lack of trust*Bailed-out*D08	0.16*	0.13***			-0.03	-0.23**		
	(0.093)	(0.051)			(0.265)	(0.102)		
Lack of trust*D09	-0.06	-0.01			-0.02	-0.00		
	(0.049)	(0.020)			(0.050)	(0.019)		
Lack of trust*Bailed-out*D09	0.01	0.01			0.13	-0.07		
	(0.093)	(0.044)			(0.237)	(0.083)		
Risk aversion*Bailed-out			0.02	0.00			0.10	0.09
			(0.039)	(0.015)			(0.153)	(0.064)
Risk aversion*D08			-0.05	-0.03			-0.00	-0.03
			(0.050)	(0.025)			(0.048)	(0.024)
Risk aversion*Bailed-out*D08			0.08	0.15***			-0.15	0.01
			(0.098)	(0.054)			(0.268)	(0.122)
Risk aversion*D09			-0.08	-0.01			-0.06	-0.02
			(0.050)	(0.019)			(0.051)	(0.019)
Risk aversion*Bailed-out*D09			-0.02	0.00			-0.05	-0.00
			(0.103)	(0.041)			(0.228)	(0.051)
Observations	1,897	3,491	1,894	3,315	1,344	2,549	1,348	2,406
Within R-squared	0.05	0.07	0.05	0.10	0.09	0.06	0.07	0.06
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES
Customer fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank controls	YES	YES	YES	YES	YES	YES	YES	YES

Table E.5: Exploring heterogeneity across bank customers – bank-time fixed effects

This table shows the estimates of a fixed effects model. The dependent variable is *Switch* which is a dummy variable indicating whether one switched to another bank in a given year. The dummy *Bailed-out* denotes whether the customer is with the bailed-out bank at the beginning of the year. *D08* is a year dummy. *Lack of trust* and *Risk* aversion are binary variables capturing whether the customer has respectively low trust in the government and a high level of risk aversion. We consider the period 2004-2008. The first four columns show the results for the nationalisation and the last four columns show the results for the capital injection. The header of each column denotes the banking product in question. In all cases, the sample is restricted to customers of the intervened bank studied and Rabobank. The specifications include bank-time fixed effects and customer fixed effects. Robust standard errors clustered on the customer level are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

	Fortis/ABN Amro				ING			
	Savings account	Current account	Savings account	Current account	Savings account	Current account	Savings account	Current account
Lack of trust*D08	-0.03	-0.04			-0.01	-0.03		
	(0.052)	(0.028)			(0.051)	(0.027)		
Lack of trust*Bailed-out	-0.05	-0.00			0.81*	0.09		
	(0.256)	(0.575)			(0.416)	(0.732)		
Lack of trust*Bailed-out*D08	0.18*	0.14***			-0.05	-0.24**		
	(0.095)	(0.054)			(0.268)	(0.106)		
Risk aversion*D08			-0.05	-0.04			0.01	-0.04
			(0.057)	(0.028)			(0.055)	(0.027)
Risk aversion*Bailed-out			0.04	-0.00			0.10	0.09
			(0.038)	(0.014)			(0.155)	(0.068)
Risk aversion*Bailed-out*D08			0.17	0.18***			-0.17	0.03
			(0.111)	(0.059)			(0.289)	(0.135)
Constant	0.17***	0.03	0.21***	0.03	0.20***	0.10***	0.17***	0.10***
	(0.065)	(0.100)	(0.064)	(0.090)	(0.042)	(0.040)	(0.042)	(0.020)
Observations	1,625	2,978	1,595	2,800	1,122	2,077	1,106	1,935
Within R-squared	0.06	0.09	0.06	0.13	0.11	0.07	0.09	0.07
Customer fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank-Time fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

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