

How important is the distribution channel for mutual fund flows?*

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Abstract

We use bank failures to identify exogenous variation in the distribution channel of bank-affiliated mutual funds. We provide three main contributions. First, we establish a causal effect from the distribution channel to retail investors' fund portfolios. We show that the distribution channel drives at least a third of households' choices of mutual funds. Second, we study the dynamics of flows over time. We find that a substantial fraction of people move their entire fund portfolio, when they move. Third, we find that investors' reallocations of funds caused by changes in the distribution channel do not significantly improve investors' performance.

Key words: Mutual funds, retail investors, fund flows, distribution channel.

JEL classification: D14, G01, G11, G21

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1. Introduction

Mutual fund flows affect fees and performance of mutual funds, wealth accumulation in the economy, and financial market liquidity and prices. Understanding what determines fund flows is thus important. Investors' choices of funds are typically traced to their preferences for fund performance. However, fund investments are often intermediated. The distribution channel of mutual funds to retail investors is typically intermediated via financial advisors/brokers in the US (Bergstresser, Chalmers, and Tufano, 2009; Del Guercio and Reuter, 2014) and via banks in Europe (Ferreira, Matos, and Pires, 2018). European mutual funds manage around 35% of total worldwide AUM in 2019 while US funds manage around 45% (ICI, 2019).

There is agreement in recent empirical literature that the distribution channel of mutual funds influences retail investors' choice of funds.¹ However, the fact that many theoretical models primarily model fund choices with risk-return preferences without explicitly accounting for the distribution channel (Berk and Green, 2004, and for a survey Christoffersen, Musto, and Wermers, 2014), while other incorporate a role for it (Gennaioli, Shleifer, and Vishny, 2015; Garleanu and Pedersen, 2018; Roussanov, Ruan, and Wei, 2020; and Egan, 2019), indicates that there is uncertainty about *how* important the distribution channel is. At the same time, there is debate about the role of financial advisors, an important part of the distribution channel. Bergstresser, Chalmers & Tufano (2009), Mullainatha, Nöth & Schoar (2012), Hoechle, Ruenzi, Schaub & Schmid (2017, 2018), and Fecht, Hackethal, & Karabulut (2018) present evidence that financial advice in the distribution channel is biased and does not help retail investors, whereas Gaudecker (2015) and Linnainmaa, Melzer & Previtro (2018) provide a more favorable picture.

We use a unique setting to identify the causal effect on retail investors' fund flows from one mutual fund company to another resulting from exogenous variation in investors' exposure to the distribution channel of bank-affiliated mutual funds. We estimate (i) a lower bound on the importance of the distribution channel for retail investors' choice of funds, (ii) how changes in

¹ Bergstresser, Chalmers, and Tufano (2009), Del Guercio, Reuter, and Tkac (2010), Christoffersen, Evans, and Musto (2013), Christoffersen, Musto, and Wermers (2014), Del Guercio and Reuter (2014), Gennaioli, Schleifer, and Vishny (2015), Jenkinson, Jones, and Martinez (2016), Pool, Sialm, and Stefanescu (2016), Foerster, Linnainmaa, Melzer, and Previtro (2017), Sun (2017), Linnainmaa, Melzer, and Previtro (2018), Chalmers and Reuter (2020), Sokolinski (2020), and Cookson, Jenkinson, Jones, and Martinez (2021).

the distribution channel affect the dynamics of fund flows, and (iii) whether changes in fund allocations caused by changes in the distribution channel improve investors' portfolios.

It is challenging to quantify the importance of the distribution channel for fund flows. First, it is difficult to design a clean identification strategy that allows for causal interpretation. For instance, exogenous variation in the distribution channel is needed to separate out alternative reasons for fund choices. Second, data limitations often restrict a full analysis. As an example, data from one or several brokers usually do not provide the full picture of the total mutual fund holdings of investors, but only those offered by the particular brokers.

To overcome these challenges, we study a comprehensive register-based data set including all Danish mutual fund investors from 2005-2012. The data provide us with the total mutual fund holdings, and the detailed composition thereof (fund family, number of funds, value, etc.), for each investor in the country. As we know the complete fund portfolios of each investor, we can calculate the fractions of an investor's total holdings of mutual funds that are invested in the different mutual funds. We also have information on background characteristics of the investors (age, gender, income, wealth, etc.), so that we can control for confounding effects.

To tackle the question of causality from distribution channel to fund choice, we study exogenous shocks to the distribution channel of mutual funds. In Denmark, like is typical in Europe, banks are the primary sellers of mutual funds, i.e. the distribution channel.² We study what happens to mutual fund flows of individual investors in situations where they are forced to switch bank for an exogenous reason: their original bank suddenly ceased existence following the financial crisis of 2008. When a customer is forced to switch bank, as a result of the failure of his/her old bank, there is a shift in the distribution channel of mutual funds. Mutual funds affiliated with the customers' new bank get an opportunity to directly distribute their funds to the new customers. Furthermore, banks have an incentive to guide customers towards their affiliated funds. It is important to stress that those customers forced to switch bank, and thus experiencing a shift in the distribution channel of mutual funds, do not have to switch mutual funds in our setting. Customers can decide to keep their pre-shift holdings of funds, also after shifting bank, as funds

² Ferreira, Matos, and Pires (2018) find that bank-affiliated mutual funds often account for more than 70% of mutual fund assets in European markets, i.e. are clearly the dominant players.

affiliated with their old bank continue operating normally. This is because mutual funds are separate legal entities in Denmark that distribute their funds via banks.

We investigate whether customers forced to switch bank, i.e. customers experiencing a shift in the distribution channel of mutual funds, increase their holdings of mutual funds affiliated with their new bank, after customers switch bank. Our underlying hypothesis is that a customer switching from Bank X to Bank Y is, after the switch, advised by Bank Y to buy its affiliated mutual funds because the bank has a pecuniary incentive to guide investors to the mutual fund company affiliated with Bank Y. We compare the investment decisions of investors switching bank to investment decisions of investors not switching bank, i.e. we do difference-in-difference estimations. Our main finding on how shifts in the distribution channel of mutual funds influence mutual fund flows is summarized in Figure 1a. Before the merger between the failing and the acquiring bank (before year t in Figure 1a), a customer typically does not hold funds affiliated with her new bank. After the shift in distribution channel, large portfolio shifts occur. Immediately following the merger between a failed bank and its acquiring bank, new customers in acquiring banks start increasing their holdings of mutual funds affiliated with their new bank. Flows do not change all at once, but evolve dynamically over time. Four years after the merger, a striking 35% of the total mutual fund investments of a customer have been allocated to funds affiliated with the new bank of the customer. We document that these results are highly significant in difference-in-difference regressions where we compare the treated to those not switching banks. In terms of wealth, customers have moved 22% of their entire net liquid assets into affiliated funds four years after the bank switch. In light of the well-known finding that households generally display inertia when making investment decisions (Madrian and Shea, 2001; Biliias, Georgarakos, and Haliassos, 2010; and Calvet, Campbell, and Sodini, 2009), this is a large effect.

We find that when people reallocate their fund portfolios, many move their entire mutual fund holdings to funds affiliated with their new bank. We illustrate this in Figure 1b. The figure shows the percentages of customers forced to switch bank who hold a certain fraction of their total mutual fund portfolio in funds affiliated with their new bank. This is shown for the year customers shift bank (time t) and four years after their switch. At year t , when customers are

forced to switch bank, practically no investors (1%) had almost all (90-100%) of their investments in funds affiliated with their new bank. Four years after they shift banks, 23% of customers have moved their entire fund investments to funds affiliated with their new bank. This means that the patterns we document for the average investor arises because a significant fraction of people move their entire mutual fund portfolio from funds affiliated with their old bank to funds affiliated with their new bank. The fact that investors switch their entire portfolio, after a change in the distribution channel, obviously also means that investors sell their existing holdings of mutual funds to buy funds affiliated with their new bank.

We find the same large shifts into newly affiliated funds when we look at the total sample of mutual fund holders switching banks, i.e. not only fund holders in banks that failed following the financial crisis, but all fund holders switching between large Danish banks. This implies that our results for forced bank shifts are generalizable to the broader setting. These voluntary switches may not be exogenous (which is why we focus on forced bank shifts in the main part of our paper), but they allow us to say something about the frequency and consequences of shifts in the distribution channel in general. Like in the sample of forced switchers, we find in the broader sample of all voluntary bank switchers that the distribution channel accounts for at least a third of mutual fund investors' choices of mutual fund.

We devote considerable attention to the question of why investors switch funds. We first investigate whether investors switching fund possess certain personal characteristics, e.g., have lower income, are less educated, or other proxies for low financial sophistication, and we examine proxies for their risk aversion and trust. We find some weak evidence that investors switching fund are less educated, but the, by far, main determinant of fund reallocation is the passing of time, i.e. year-by-year, after their switch of bank, more and more investors shift their complete fund portfolios to funds affiliated with their new bank. Second, we investigate whether customers are attracted by high-rated mutual funds affiliated with customers' new bank. We know from previous research that mutual-fund ratings, such as Morningstar, are important drivers of retail investors' mutual fund flows, see Del Guercio & Tkac (2008), Khorana & Servaes (2012), and Ben-David, Li, Rossi, & Song (2019). We verify that our investors in general have a strong tendency to buy high-rated funds, too. We find that the general tendency to choose high-rated funds over low-rated funds holds both before and after customers are forced to switch bank, but

people switching bank buy proportionally fewer of the very-best performing funds after a switch. Investors forced to switch bank thus end up with a lower rated fund portfolio than they held before shifting bank. We also investigate other performance metrics. We find that investors end up with less diversified portfolios that on the other hand perform slightly better and have marginally lower annual fees. The improvement in returns and fees is minimal in economic terms, though, in particular in light of the transaction costs that result from shifting funds.

We conclude that the passing of time dominates other potential explanations of why our investors reallocate funds following a shift in the distribution channel of funds. Our interpretation is that, as time passes by, it becomes more and more likely that you get in contact with your bank advisor, and, when you do, she convinces you to switch funds, even when there is no observable good reason to do so. This means that the distribution channel exerts a powerful influence on retail investors' choice of fund companies. This finding is important because the literature seldom pays much attention to the distribution channel when modelling fund flows. Our findings show that the distribution channel in itself is important for fund flows.

1.1 Related literature

The exogenous variation in the distribution channel of mutual funds that is necessary to identify its importance is clearer in markets where bank-affiliated funds dominate, as there is a clear relation between the bank (distribution channel) and the mutual fund in those markets. In the US, bank-affiliated mutual funds account for a small fraction of mutual funds (Del Guercio, Reuter, and Tkac, 2010). Instead, in the US, mutual funds are typically distributed via brokers. Brokers might cater to different mutual funds families, though, making identification less straightforward. Furthermore, in US data, it would be a complicated (if not impossible) task to compile information about the total detailed portfolios of all individual investors. This implies that it is difficult to estimate a lower bound on the economic importance of the distribution channel using US data. Analyses of US data reveal, however, that the distribution channel statistically influences flows (see references in footnote 1). While we believe that our results highlighting the importance of the distribution channel apply more broadly, we acknowledge that the different institutional set-up in the US, compared to Europe, implies that the precise magnitude of the effects we estimate is arguably more suitable for Europe than the US. But as

already mentioned, bank distribution of mutual funds, as in Europe, is almost as important globally as broker-distribution that dominates in the US.

Within the literature, our paper is probably closest related to Foerster et al. (2017), Chalmers and Reuter (2020), and Sokolinski (2020) who all use clever settings to identify a causal effect from changes in the distribution channel to fund flows. Typically, these papers focus on conflicts of interest arising from advisor incentives, whereas we study the importance of the distribution channel for funds flows and the dynamics of flows resulting from a shift in the distribution channel.³

Our findings have implications for modelling mutual fund flows. In their seminal work, Berk & Green (2004) argue that investors learn about skills of mutual fund managers by observing their past performance. Sirri and Tufano (1998), Bergstresser & Poterba (2002), Del Guercio and Tkac (2002, 2008), Ivkovic & Weisbenner (2009), Spiegel & Zhang (2013), Ferreira, Keswani, Migual, and Ramos (2012), and Christoffersen, Musto & Wermers (2014) investigate empirically whether this is the case. We find that investors make substantial portfolio shifts following exogenous variation in the distribution channel, but these shifts are not driven by a desire to buy funds with higher past performance and higher-rated funds. Our results support that the distribution channel for fund flows should be incorporated into models of fund flows, as in, e.g., Gennaioli, Shleifer, and Vishny (2015), Garleanu and Pedersen (2018), Roussanov, Ruan, and Wei (2020), and Egan (2019).

Finally, our paper is related to the literature on financial advice and advertising of own products, see for instance Gurun, Matvos & Seru (2016) for the credit market and Roussanov, Ruan & Wei (2020) for mutual funds. An important question here is whether information provided by financial advisors and advertisements provide consumers with useful information (Nelson, 1974) or whether it leads consumers to make suboptimal decisions (Thaler & Sunstein, 2008). Numerous studies find that advisor incentives influence advice and that investors perform worse

³ Other papers in the literature on the distribution channel of mutual funds i) evaluate the costs and benefits (for customers) in using the distribution channel (Bergstresser, Chalmers, and Tufano, 2009; Christoffersen, Musto, and Wermers, 2014), ii) study whether advice given by the distribution channel is useful or biased, and the role of incentives in this regard (Christoffersen, Evans, and Musto, 2013; Jenkinson, Jones, and Martinez, 2016; Coockson, Jenkinson, Jones, and Martinez, 2018; and Linnainmaa, Melzer, and Previtero, 2018), and iii) analyze whether it pays to have a distribution channel (Knuutila, Puttonen and Smythe, 2007; Pool, Sialm, and Stefanescu, 2016).

after receiving financial advice (Bergstresser, Chalmers & Tufano, 2009; Bhattacharya, Hackethal, Kaesler, Loos, Meyer, 2012; Hackethal, Haliassos & Japelli, 2012; Mullainatha, Nöth & Schoar, 2012; Christoffersen, Evans & Musto, 2013; Karabulut, 2013; Chalmers & Reuter, 2020; Foerster, Linnainmaa, Melzer & Previtro, 2015; Hoechle, Ruenzi, Schaub & Schmid, 2017, 2018; Egan, 2019; Fecht, Hackethal, & Karabulut, 2018). On the other hand, Kramer (2012), Gaudecker (2015), and Linnainmaa, Melzer & Previtro (2018) find that financial advice helps investors and that advice is not biased. We find that investors make large portfolio shifts following a switch of bank, and that the passing of time is the most important determinant of fund flows. In our setting investors do not end up with materially better portfolios.

Our paper is organized as follows. The next section provides a brief overview of the mutual fund sector in Denmark and of how the financial crisis affected Danish banks. In Section 3, we describe our data. Section 4 explains our treatment and control groups, and provides summary statistics. Section 5 presents results from static analyses that evaluate the likelihood of owning funds affiliated with the individual's bank. Our main analyses are presented in Sections 6 and 7. In Section 6, we investigate what happens to mutual fund flows after investors are forced to switch bank. Section 7 analyzes why investors shift funds after bank switches. Section 8 studies all bank switches. A final section concludes.

2. Danish mutual funds and the financial crisis

2.1. Mutual funds in Denmark⁴

A Danish mutual fund family is owned by investors who appoint a management company to be responsible for the daily operations of the fund. The management company is typically owned by a single bank or by a consortium of smaller banks. This means that banks have incentives to promote certain funds, as banks make agreements with their affiliated funds that channels revenues from funds to banks, when banks sell services to the funds. These services include, first and foremost, a distribution channel (for which the bank is paid a distribution fee from the mutual fund), but might also include portfolio advice, legal advice, trading executed by the trading desk of the bank (such that the bank earns on the trading activities of the fund), the assets of the

⁴This section builds upon Bechmann & Rangvid (2006, 2007) where further information about the Danish mutual fund industry can be found.

mutual fund might be deposited in the bank (for which the bank receives deposit/custody fees), etc.

Banks earn sizeable revenues on the relationship with their affiliated mutual fund. In 2011 (the last year in our sample for which we have independent information on banks' revenues from retail mutual fund investors; see Morningstar, 2013), total revenues of Danish banks from affiliated funds equalled DKK 5bn (app. USD 0.8bn at the time of writing). Given that total revenues in Danish banks amounted to DKK 70bn (USD 11bn) in 2011, where DKK 50bn were net interest revenues and DKK 20bn were revenues from fees and provisions, around $5/20 = 25\%$ of total fees and provisions in Danish banks came from affiliated mutual funds.

In most cases, and in particular for large banks, the relationship between a bank and its affiliated mutual fund family is clear, even from the names. For instance, the mutual fund family of the largest bank, Danske Bank, is Danske Invest. The mutual fund family of the second largest bank, Nordea Bank, is Nordea Invest. Similarly, the mutual fund family of the third-largest bank Jyske Bank is Jyske Invest, that of Nykredit Bank is Nykredit Invest, Sydbank has SydInvest, etc. For other banks, particularly smaller banks, the relationship is less clear, as small banks enter into agreements with fund families that cater to different banks. We focus on banks where the relationship is clear. Our hypothesis is that a customer in, e.g., Danske Bank is advised to buy mutual funds in Danske Invest, as Danske Bank has a pecuniary incentive to guide investors to Danske Invest.

The banks that went bankrupt following the financial crisis were generally smaller banks. As just mentioned, these smaller banks used different fund families owned by consortiums of smaller banks.⁵ This has two important implications for our study. First, a mutual fund cooperating with one of our failing banks also cooperated with other banks, which means that these mutual funds were practically unaffected by the bank bankruptcies we study. In fact, no major mutual fund disappeared or merged with another mutual fund during our sample period. This has the important implication that customers in failed banks could have kept their old funds after shifting bank. There is no immediate reason for investors to switch funds following a bank failure.

⁵ E.g., one of the failed banks was Roskilde Bank (see Section 4). There exists no mutual fund family labelled Roskilde Invest or the like.

Second, when there is no one-to-one relation between smaller banks and mutual funds, banks under financial distress could not increase fees from mutual funds to increase revenues.⁶

2.2. The financial crisis of 2008-09 in Denmark⁷

The financial crisis took its turn on the Danish economy. Danish GDP fell by around 7% from 2007-2009, real house prices dropped by around 20%, and unemployment almost tripled, albeit from a very low level. Many banks failed as losses accumulated. Banks ceasing existence were typically acquired by other healthier banks. The customers we study were customers in a subsample of these banks. The subsample is described in further detail in Section 4.

A main conclusion in Rangvid et al. (2013) is that the authorities (and banks themselves) did not foresee the crisis, like in many other countries. This conclusion is based on statements and actions from the Financial Supervisory Authority, the Central Bank, the relevant ministries, investors, and the banks themselves. Assets prices, such as CDS spreads on bank debt and stock prices of banks, also reacted late, i.e. when the crisis was in fact occurring. As the financial crisis was unexpected to banks and authorities, i.e. insiders with private information, the only reasonable assumption is that the crisis could not be foreseen by ordinary bank customers, either.⁸ This means that customers in failed banks can be viewed as treatment groups, as they experienced an unexpected bank-failure shock, and customers in surviving banks as control groups that did not experience the same shock.

3. Data

Our data are very comprehensive. The data are based on detailed individual-investor register-based data where we use all mutual fund holders (above the age of 17) in Denmark, i.e. we have the total (100%) population in our starting sample. We combine three main sources of data.

⁶ Ferreira et al. (2018) show that fund managers in bank-affiliated mutual funds support the bank's lending business by investing in firms the bank has lending operations with. This is not the case in our setting of failed banks.

⁷ The brief overview in this section builds on the report from the committee investigating the financial crisis in Denmark, the so-called 'Rangvid-committee'; see Rangvid et al. (2013), where many more details can be found.

⁸ One might discuss whether customers increased their assessed probability of a new bank failure after having observed several banking failures, i.e. at later stages during the post-crisis period. Most of our cases deal with the early part of the post-crisis period, where authorities, banks, investors, and customers had not foreseen the crisis.

3.1. Mutual fund holdings of retail investors

From the Danish Tax Authorities, we obtain data on individuals' end-of-the-year mutual fund holdings. The data are based on direct mandatory reporting from Danish financial institutions to the Danish Tax Authorities. The first year in our sample is 2005 and the last year is 2012. Our data thus conveniently surround the 2008-2009 financial crisis.

The data contain individuals' holdings of mutual funds outside retirement accounts. We know the number and value of individual mutual funds held by each investor at year-end. With these data, we can calculate the total value of each individual's mutual fund investments, the value held in the mutual fund family affiliated with a particular bank, and the value-weighted ratings, costs, and performance of the individual's portfolio of funds. We also know the ISIN code of the fund, such that we can merge with data on fund ratings from Morningstar.

3.2 Main bank relation

We are interested in identifying the effect of a change in an individual's main bank. We identify the main bank as the bank in which the individual has a so-called 'NemKonto' (*Easy Account*). All citizens in Denmark are required to have an *Easy-account*.⁹ This is a normal bank account that the individual herself assigns as her *Easy Account*. It is through the *Easy Account* that all monetary interactions with public agencies take place (tax refunds, child support, housing benefits, etc.). Salaries are generally paid to the *Easy Account*, too. Individuals typically assign an account in the bank where they have their main banking activities as their *Easy Account*.¹⁰

3.3. Other data

In our regressions, we include socioeconomic background data for the individuals, such as the investor's age, wealth, income, level of education, gender, number of children, etc. These data come from Statistics Denmark.

⁹ See: <https://www.nemkonto.dk/ServiceMenu/Engelsk>.

¹⁰ Individuals may have accounts by more than one bank, and banks may contact their account holders (and try to convince them to buy mutual funds) even if the account is not the *Easy Account*. We choose to assign each person to one main bank since the *Easy Account* is a clear and credible identification of customers' main bank. If people have bank accounts at several banks, and the effects we document spill over to these accounts/banks as well, the estimates we present are conservative lower bounds on the grand effect.

4. Sample of mutual fund holders: Treatment and control groups

We analyse six banks and their associated mutual funds, listed alphabetically in Panel A of Table 1. The banks and funds we analyse fulfil two, for our analysis, crucial criteria. First, there should be a clear direct relation between the mutual fund and the bank. This rules out any doubt that the bank has an incentive to sell its affiliated fund. Second, the bank should have acquired another bank during the sample period. Banks 2-6 in Panel A of Table 1 fulfil these two criteria. In addition, we include the largest bank in Denmark, Danske Bank, and its associated mutual fund. Danske Bank did not acquire another bank during the sample period, but its inclusion expands our control group significantly.

The number of banks we study might be low (6), but the number of individuals is very high. This is an important fact to remember, as it is not banks as such we study, but bank customers who buy mutual funds. The crucial point in our investigation is to have enough information on investors. Panel B of Table 1 provides the number of depositors in the six banks, the number of fund holders in the mutual funds affiliated with these banks, and the rest of the market, i.e. the total number of depositors in banks in Denmark and the total number of retail investors in Danish mutual funds. Numbers are year-end 2012. There are 4,241,715 retail bank depositors in Denmark at the end of 2012. This basically corresponds to the total number of residents (above the age of 17) in Denmark at the end of 2012. There were 438,278 mutual fund investors at the end of 2012, i.e. app. 10% of Danes own mutual funds.¹¹ Panel B reveals that the six banks mentioned in panel A of Table 1 cover app. 70% of all bank customers in Denmark and their six affiliated mutual fund families more than 80% of all retail mutual fund investors.

Confidentiality regulations of Statistics Denmark require that any published information is based on at least three banks, mutual funds, or individuals, such that data for specific firms or individuals cannot be identified. This is why we collect banks 1-3 and 4-6, respectively, in Panel B of Table 1. The combined balance sheets of the six banks in Table 1 cover more than 85% of

¹¹ Our data include mutual fund holdings outside retirement accounts. We are interested in studying cases where the investor herself makes the investment decision. Non-retirement savings are particularly useful in this regard, as most Danish retirement schemes do not allow investors themselves to make investment decisions (in most retirement schemes, the pension fund company makes investments decisions on behalf of the individual pension savers).

the total balance sheet of banks in Denmark. In total, our sample covers a very large majority of the total market of Danish banks, depositors in banks, and mutual fund investors.

4.1. Cases of forced switches

An ideal set-up to test the hypothesis that an investor's choice of mutual fund is influenced by the distribution channel of mutual funds requires two ingredients: (i) identifiable exogeneous variation in the distribution channel and (ii) a possibility to test for changes in the investors' holdings of mutual funds resulting from the change in the distribution channel. We have such a set-up as we can compare mutual fund flows of investors being forced to experience a shift in the distribution channel (because they are forced to switch bank; treatment group) to mutual fund flows of other investors not switching banks (control group).

To find our treatment group, we identify banks that ceased existence during the 2005-2011 period. We carefully screen all cases and select those banks that fulfill two criteria: (i) The bank should have ceased existence during the 2005-2011 period and (ii) its retail customers should have been transferred to an acquiring bank (or more banks) that is directly affiliated with one mutual fund family.¹² The connection between the acquiring bank and its affiliated mutual fund is identified by a common name (Danske Bank and Danske Invest, e.g.). There are six mergers fulfilling these two criteria. They are listed in the Appendix, Table A, together with the total number of depositors in the six acquired banks, the year in which the acquirement took place, as well as a short description of each of the six acquisitions. The banking distribution is skewed in Denmark, with a few large banks (those in Table 1) covering the majority of the population and many small banks servicing the rest. The six acquired banks we study, thus, were relatively small, with app. 120,000 customers in total. One of them (Roskilde Bank) was among the ten largest banks in Denmark, though, which again emphasizes that the banking distribution is skewed. The fact that our treatment group consists of relatively small banks does not influence the interpretation of our results, as already mentioned, as we focus on the impact of a bank shift on the fund holdings of an individual investor, independent of the size of the bank. Also, in Section 8, we study the transition between large banks and find robust results.

¹²The period is 2005-2011, as we need at least one year of data following the merger in order to be able to test for effects resulting from the change of customers' main bank.

Our treatment group consists of customers in the acquired banks who switch to the acquiring bank after the merger. Each branch of a bank is associated with a branch level code. The way we identify a treated customer is via a change in the branch number of the *Easy Account* of the customer or branch ownership. In other words, when the branch level code associated with a customer's *Easy Account* changes, from the branch level code of the old acquired bank to the branch level code of the new acquiring bank, then the customer is in the treatment group. This implies that we avoid including any voluntary switches that occur prior to the merger, since nobody can join a branch that does not exist (as the new branch does not exist until after merger). Moreover, since some customers may have voluntarily joined such a branch *after* its new bank created it (but before year-end, when our data is registered), we further restrict the treatment sample to those who not only were customers of that newly created branch at the end of merger year itself, but also in the corresponding old-branch the year prior to the merger. In short, this branch level identification allows us to exclude all voluntary switches. This significantly tightens the identification of our treatment group.

4.2. Summary statistics: Mutual fund holders

Table 2 compares summary statistics on mutual fund holders forced to switch bank to the total universe of mutual fund holders and to the control group, the latter being customers in one of the acquiring banks mentioned in Panel A of Table 1. We show results for the first and the last year in the sample, 2005 and 2012. Table 2 shows that there are 11,114 mutual fund holders who have been forced to switch bank. From the Appendix, Table A, we know that there are 119,623 depositors in the acquired banks in the years the takeovers take place. This means that app. ten percent of depositors in acquired banks own mutual funds, similar to the number for the total population.

The main take-away from Table 2 is that mutual fund holders forced to switch bank share characteristics with the typical mutual fund holder in Denmark and the typical fund holder in the control group. E.g., they are basically equally old on average, the same fraction has a higher education, they have more or less the same level of income and wealth, hold app. the same number of different mutual funds, the average value of funds for the different groups of fund holders is almost the same, etc. This goes for 2005 and 2012, as well as the years in between (not shown to save space). In other words, the parallel trends assumption is fulfilled.

When describing the treatment and control groups of banks, a relevant question is whether mutual funds offered by small banks are rated higher than mutual funds offered by large banks, in which case customers in failed banks could be attracted to these smaller banks because their affiliated mutual funds perform better. This is not the case. The average Morningstar rating of all Danish mutual funds is 3.3 across funds and years. The average rating of funds affiliated with the acquiring banks in our sample is also 3.3. The average rating of the remaining Danish mutual funds, i.e. funds affiliated with non-acquiring banks is 3.3, too. Also, there is basically no time variation in this pattern, i.e. this holds both before and after the financial crisis. Finally, we examine the distribution of Morningstar ratings, as it might be that mutual funds offered by acquiring banks have the same average rating as failed banks, as just mentioned, but a more dispersed distribution with, e.g., more 1- and 5-star funds. We cannot identify any such systematic pattern in the distribution of funds affiliated with acquiring banks. In total, customers in non-acquiring banks did not chose these banks because the banks are affiliated with better funds.

It is also important to point out that any investor can always buy any fund in Denmark. This means that even if investors (before their bank switch) for some reason had preferences for the funds of acquiring banks, investors could simply have bought these funds before the bank switch. Should it have been the case (which we find no evidence of) that funds of acquiring banks are “better” than funds of acquired banks, it would not have explained our findings of a large reallocation of mutual funds following investors’ switch of banks, as investors could just as well have bought these funds before their bank switch.

The fact that mutual fund holders forced to switch bank and other mutual fund holders share the same characteristics, and that funds offered by acquiring banks are rated on par with funds of non-acquiring banks, is important, as it implies that mutual fund holders forced to switch bank were, overall, no different from other mutual fund holders. They just happened to be customers in banks – perhaps simply because they lived geographically close to them – that ceased existence following the financial crisis.

5. Static analysis: What is the likelihood of holding a fund affiliated with your bank?

To get a first feeling for the tendency of retail investors to buy mutual funds affiliated with their main bank, we first analyze all fund holders in the six acquiring banks in a static setting.

Figure 2 gives a first impression. It shows for mutual fund holders who are also depositors in banks 1-6 in Table 1, the number of individuals holding funds and the value of their holdings in 2012 (other calendar years are shown in Table B of the Appendix). Panel A of Figure 2 shows that there are 326,857 customers in the six banks that have invested in mutual funds in 2012. 256,610 of these hold affiliated funds. This means that 78.5% of mutual fund holders buy at least one fund from the mutual fund family affiliated with the main bank of customers. A similar picture emerges if looking at the average value of mutual fund holdings. Panel B shows that the average value of holdings in 2012 was DKK 436,139. Of this, DKK 309,587 was in funds affiliated with the main bank of investors. This means that 68.7% of the total value invested in mutual funds was invested in funds from the mutual fund family affiliated with the customer's main bank.¹³ This static snapshot indicates the steady-state magnitude of the impact of the distribution channel. The upper bound on the role of the distribution channel is thus 70%-80%. The steady state effect does not, however, tell us about causality, i.e. whether this really is due to the distribution channel, nor about the dynamic responses to a shift in the distribution channel. These issues are addressed in Sections 6 and 7.

To further investigate what predicts holding affiliated funds in steady state, we estimate panel probit regressions where the outcome variable is a dummy equal to one if the investor owns an affiliated mutual fund (i.e. a fund from a fund family affiliated with the main bank of the customer) and zero otherwise. The explanatory variables are dummies for the bank relation of the customer and other controls. To save space, we delegate the results from these regressions to the Appendix (Table C). The main conclusion is that the effect of being a customer in a bank affiliated with the mutual fund is highly important for the decision to buy an affiliated fund.

To summarize, there is a strong tendency for bank customers to buy funds from the mutual fund family affiliated with customers' main bank. We next investigate whether the distribution channel

¹³ This number (68.7%) is almost spot-on the number mentioned for Denmark in Ferreira et al. (2018), Table 1.

is causal for funds choices by examining exogenous variation in bank-customer relationships and what this entails for the magnitude of mutual funds flows.

6. Dynamic analysis: What happens after customers switch bank?

This section presents the main results of our paper; what are the consequences of an exogeneous change in the distribution channel of mutual funds. Table 3 shows what happens to investors' holdings of funds from mutual fund families affiliated with investors' new bank before and after investors are forced to switch banks. The switch is forced because the bank – where individuals were customers prior to the bank merger – is bought by another bank. We compare fund holdings of these investors with mutual fund holdings of customers not switching bank, our control group. Results for the treatment group, the forced switchers, are in Panel A and results for the control group, the non-switchers, are in Panel B. We show what happens to the number of individuals holdings funds, number of different mutual funds in the investors' portfolios, and the value of mutual fund holdings.

Before the merger, very few customers in the acquired bank (our treatment group) hold funds affiliated with the acquiring bank: around 2%-3% of investors. This means that very few customers in Bank X held mutual funds affiliated with Bank Y before the merger between Bank X and Y. Similarly, Panel A also shows that mutual fund investors in the treatment group hold very few funds affiliated with the acquiring bank before the merger (app. 1.5% or less of their total fund holdings), and have invested only relatively low fractions of their total investments in mutual funds (less than 1.5%) affiliated with the acquiring bank. These numbers are stable before the merger, i.e. there are no pre-merger trends.

After the merger, things change dramatically. Already after one year, 13.4% of customers in the acquired bank hold funds affiliated with the acquiring bank, increasing to 50.5% after 4 years. This is a dramatic increase in light of the fact that basically none of them held mutual funds affiliated with the acquiring bank before the merger.¹⁴ Similarly, the investor starts holding an

¹⁴ The careful reader will notice that the number of mutual fund holders drop significantly after switching bank. Four years after the merger, there are 50% less mutual fund holders (5,923 instead of 12,536). This is not due to an unusually high number of customers leaving their new bank, but due to the timing of mergers and the number of years we can follow customers after a merger. One case (Jyske/Fjordbank, see Appendix) leaves the sample at t+2 in Table 3 and one at t+4 (Nordea/Fionia), explaining the reduction.

increasing number of funds affiliated with the acquiring bank, increasing to 34.4% of the number of funds after 4 years (on average, an investor holds four funds). Is it so that the treated individuals start buying a lot of funds in general after they switch bank? No. The average fractions of funds invested in funds affiliated with any non-acquiring banks are low and stable, both before and after the merger. Treated individuals only increase their holdings of funds affiliated with the acquiring bank. Finally, the value of investments in funds affiliated with the acquiring bank increases dramatically as well, reaching 36.7% after 4 years. This implies that the distribution channel drives at least a third of the individuals' portfolios into new mutual fund holdings. No such trend is observed in the average fraction of fund value invested in funds affiliated with non-acquiring banks. Figure 1a illustrates these findings.

The economic magnitude of the changes is large. Four years after a merger, forced switchers hold on average app. DKK 200,000 (app. USD 31,000) in funds affiliated with their new bank.¹⁵ From Table 2, we know that net liquid assets (the difference between overall wealth and housing wealth) on average amounts to app. DKK 900,000 (app. USD 140,000). This means that the new bank is able to switch 22% of net liquid assets into affiliated funds in the course of four years.

These changes in mutual fund holdings are only occurring for customers forced to switch bank as a result of a bank merger. Customers in the six banks in Table 1 who remain customers in the same bank during our sample period, i.e. non-switchers, generally invest heavily in affiliated funds, but no dramatic changes occur. This appears from Panel B of Table 3 that shows statistics for individuals in the control group, i.e. mutual fund holders that are non-switching customers of banks that offer affiliated mutual funds. Around 82% of non-switching mutual fund holders hold funds from affiliated funds (slightly lower in 2005 and 2006), and around 73% of invested fund values are invested in affiliated funds. These numbers are all fairly stable after 2007. So, the changes we document in Panel A are particular for customers forced to switch bank.

Is it so that all investors shifting bank increase their holdings of funds affiliated with their new bank little by little, i.e. change a small fraction of their mutual fund portfolio this year, a little

¹⁵ DKK 200,000 is the average value the individuals in the treatment group hold in funds affiliated with their new bank. This is different from $452,841 \cdot 36.7\% = \text{DKK } 166,000$, as the DKK 452,841 and 36.7% reported in Panel A of Table 3 at $t+4$ are average total wealth and average fraction, i.e., there is a difference between the average fraction and the fraction of averages.

more next year, etc.? Or, is it so that some investors change their complete fund portfolio one year, next year other investors change their portfolio completely, etc.? Figure 3 provides a surprisingly clear answer: It is mainly the second effect that explains our findings. The figure shows the percentages of customers forced to switch bank who hold a certain fraction of their total mutual fund portfolio in funds connected with their new bank at t , $t+1$, $t+2$, $t+3$, and $t+4$ years after their switch of bank.¹⁶ For instance, at merger year t , 98% of customers forced to switch bank had less than 10% of their mutual fund holdings in funds affiliated with their new bank, and only 1% had 90-100% of holdings in funds affiliated with their new bank. Moving from t to $t+1$, to $t+2$ etc., the fraction of customers holding almost nothing (0-10%) in funds affiliated with their new bank drops and the fraction holding almost their entire portfolio (90-100%) in funds affiliated with their new bank increases. This means that the pattern documented in Table 3 and Figure 1a for the average investor largely arises because more and more people move their entire mutual fund portfolio from funds affiliated with their old bank to funds affiliated with their new bank.

Figure 3 also provides another important insight; it is not only additional money that are directed towards funds affiliated with the new bank of the customer. Instead, customers deliberately sell existing holdings of funds and use the proceeds from the sales to buy funds affiliated with their new bank, i.e. a portfolio reallocation. This we see from Figure 3 because an individual naturally cannot end up with 100% of her mutual fund portfolio in funds affiliated with her new bank, unless she sold existing funds (remember that we observe investors' full portfolios).

Also, Panel A in Table 3 shows that treated investors held funds for DKK 370,781 at time $t-1$, i.e. one year before being moved to a new bank. At $t+4$, the value of those funds, i.e. the value of those funds the investor held before the switch, has decreased to DKK 62,985, a reduction of 83%. At the same time, the value held in funds affiliated with her new bank increases from DKK 3,350 at $t-1$ to DKK 205,153 at $t+4$. Clearly, customers sell existing funds to buy new funds affiliated with their new bank. We find the same pattern in Section 8 where study voluntary bank shifts.

¹⁶ Extending the figure to include $t-1$, $t-2$, etc. provides the same picture, i.e. before year t , almost 100% of investors had practically no allocations to funds affiliated with their future bank.

6.1. Regressions

We want to compare changes in mutual fund holdings for forced switches (treatment group) to changes for non-switchers (control group), controlling for individual background characteristics and other effects. We present the results from such difference-in-difference panel regressions in Table 4.¹⁷ We look at four outcomes: The number of affiliated funds an investors holds, the fraction of mutual funds being with an affiliated fund, the value invested in affiliated funds, and the fraction of total mutual fund investments going to affiliated funds. We are interested in how these variables change after a customer is forced to change bank. To answer this, we regress the outcome variable on a dummy variable picking out those mutual fund holders who are forced to switch bank (the treated individuals), time dummies that take the value 1 in each of the four post-merger years, and, most importantly, the interaction between the dummy picking out individuals forced to switch and the time dummies picking out post-merger periods, as well as control variables (age, education, etc.) and year fixed-effects,

$$y_{i,j,t} = \alpha + \beta \text{ForcedSwitcher}_{i,j} + \sum_{k=1}^4 \gamma_k D_{i,j,t+k} + \sum_{k=1}^4 \delta_k \text{ForcedSwitcher}_{i,j} \cdot D_{i,j,t+k} + \text{Controls}_{i,j,t} + \varepsilon_{i,j,t} \quad (1)$$

where $y_{i,j,t}$ is outcome variable for individual i in bank j at time t , $\text{ForcedSwitcher}_{i,j}$ picks out individual i in bank j that has been forced to switch, $D_{i,j,t+k}$ is the dummy equal to 1 in one of the four years after the merger that we follow individual i in bank j and 0 in other years, and $\text{Controls}_{i,j,t}$ collects control variables and year fixed effects. In this section, we discuss the key estimates of interest: β and δ_1 , δ_2 , δ_3 , and δ_4 . In the next section, we discuss the controls.

Consider first the estimates of β presented in the first row of Table 4. Forced switchers (the treated individuals) own 2.32 less funds affiliated with their new bank before the merger, compared to non-switchers. Similarly, the fraction of funds invested in funds affiliated with their new bank is 68.1%-points lower, the value of their holdings in funds affiliated with their new bank is DKK 280,264 (\approx USD 43,000) lower, and the fraction of fund value invested in mutual funds affiliated with their new bank is 66.1% lower, all compared to non-switchers. The δ -coefficients show cumulative effects. After four years, the pre-merger differences between

¹⁷ We assume the post-merger period to be 2009-12 for non-switchers.

treatment and control have been reduced by 1.06 funds, 28.9%-points, DKK 163,215 (\approx USD 25,000), and 29.6%-points for the four outcome variables, respectively. On all measures, this constitutes a large effect. For example, the difference in value invested in affiliated funds has been reduced from app. DKK 280,000 to app. 120,000 (280,000 – 160,000) over four years. This means that in just four years, more than half of the transformation of a new customer to a regular customer (a starting difference of DKK 280,000 has been reduced to DKK 120,000) has been accomplished.

The *t*-statistics are large in these regressions. This is natural as the regressions include the entire population of mutual fund holders. Table 4 shows that there are more than 2.5 million observations in each regression. The statistical power of the regressions is therefore non-surprisingly high.

6.2. Robustness

In Table 4, we include year fixed effects to control for macroeconomic events that affect all banks/customers. We also run regressions where we control for bank-by-year fixed effects, such that we compare forced switchers to other customers within the same bank within the same period. Qualitatively, results remain robust to adding these additional fixed effects, though with quantitative amendments. For instance, in column (4) of Table 4, we find that forced switches have increased their holdings of funds affiliated with their new bank by 29.56% four years after the switch of bank, corresponding to DKK 163.215 (column (3)). Including bank-by-year fixed effects, the percentage increase is 31%, corresponding to DKK 109,000, and coefficients remain very significant, even when *t*-statistics drop somewhat. Results from these regressions are in Table D in the Appendix.

Similarly, in Table 4, we include the largest bank in Denmark, Danske Bank, in the control group, in order to expand the control sample, even when Danske Bank did not buy any failed bank, as mentioned in Section 4. We have also run the regressions excluding Danske Bank. Results again remain qualitatively robust, with minor quantitative amendments.

7. Why do people reallocate funds?

In this section, we examine three potential reasons why investors reallocate funds after they switch bank: (i) whether these investors possess certain personal characteristics, (ii) whether

people shift to better-rated funds, or (iii) whether people shift to better-performing funds. We conclude that none of these hypotheses explain the large fund flows we observe. Instead, the passing of time is the most important factor explaining fund flows. One interpretation of this finding is that the likelihood that you get in contact with your bank advisor increases over time, and, when you do, she convinces you to switch funds, even when there is no observable good reason to do so.

7.1. Who shifts funds?

We start out investigating the characteristics of those investors who shift funds (following a bank switch), i.e. the effect of the control variables in Table 4. The regressions in Table 4 use more than 2m observations, implying that all control variables are statistically significant. We therefore focus on the magnitudes of the estimates. In column (4), the coefficient to the high-education dummy is the largest among the control variables. Highly educated individuals hold a 3.48% point lower fraction in affiliated funds after their switch of bank. On the other hand, immigrants hold a 3.38% point higher fraction. Women, married people, and people with kids are less likely to hold affiliated funds, whereas income, age, and wealth have small economic effects. The time dummies dwarf all these effects, though. After one year, treated investors hold 2.02% points more in funds affiliated with their new bank, after two years, 14.96% points more, and so on. Four years after their switch of bank, treated investors hold 29.56% in funds affiliated with their new bank. This is almost ten times more than the effect of education. Passing of time is the most important determinant of fund shifts.

We also estimate a probit model among the treated, i.e. those forced to switch bank. Within the treatment group, we investigate what determines the probability that treated individuals hold funds affiliated with their new bank after they switch bank. To save space, we relegate the detailed results from this estimation to Table E in the internet appendix, but summarize the results here. Similar to column (4) of Table 4, this probit estimation reveals that the largest effects of the socioeconomic controls arise from having a higher education (2% smaller probability) and being an immigrant (3% larger probability). Also similar to Table 4, the time fixed effects clearly dominate the effects of the controls. The probability of owning affiliated funds one year after the switch is 10% and goes up to 39% four years after the switch of bank.

Why does the passing of time have such a large effect? Our interpretation is that the likelihood that a customer is contacted by an advisor increases over time, and, when that happens, the advisor convinces people to switch funds. In our data, we cannot see when people are in contact with their bank advisor, but the evidence from Figure 1b showing that when people switch funds, many switch their complete fund portfolio, supports this explanation.

7.1.1 Risk aversion and trust

In addition to observable characteristics, such as gender, income, the passing of time, etc., one might hypothesize that the shock of a bank failure itself influences peoples' (unobservable) risk aversion. For instance, one could imagine that some investors increase their risk aversion and reduce, potentially terminate, their fund investment all together after having experienced the distress of their original bank going under. A related hypothesis is that a bank failure might affect peoples' trust in the advice given by their old now-failed bank. If people lose trust in recommendations given by their now failed bank, people might want to switch funds. It is difficult to distinguish between risk aversion and trust in the data, but we can test whether customers in failed banks are more likely to leave mutual funds altogether (the extensive margin) or shift their investments to funds affiliated with their new bank (the intensive margin).

To evaluate the intensive and extensive margin, we make use of the fact that the bank mergers took different forms. Three of the six merged banks in our sample went bankrupt. These banks were initially taken over by Danish Financial Resolution Authority, before being sold to private commercial banks. The remaining three banks were sold in ordinary merger transactions. These banks were generally also challenged, but they managed to merge with other banks before going bankrupt. Table A in the internet appendix describes the details of the mergers. Customers in the three banks that were orderly merged with stronger banks had a less distressed transition to their new banks.¹⁸ We compare the behavior of customers in banks that went fully bankrupt with the behavior of customers in banks that were taken over by relatively healthier banks.

¹⁸ For instance, the Financial Resolution Authority is required to charge relatively high interest rates and fees, so as not to expose private commercial banks to undue competition. This makes the transition more painful for customers in banks that are first taken over by the Resolution Authority and then eventually sold to a private bank, compared to customers in banks that directly merge with another private bank. Hence, the shock to trust and risk aversion might be larger for people in banks that take a detour around the Resolution Authority before being sold to other private banks.

Intensive margin

Table 5 shows results from regressions that test whether customers in banks that went bankrupt have an even larger tendency to buy affiliated funds (intensive margin). The regression equation is as in Eq. (1), but the sample now consists of forced switchers only. The treatment dummy picks out customers in the three banks that went bankrupt, while the control sample consists of customers in the other acquired banks. Columns (1) to (4) show results for the same outcome variables as in Table 4. We find that customers in banks that went bankrupt do not have a higher tendency to invest in funds affiliated with their new bank. For instance, column (4) of Table 5 shows that four years after the merger, customers in failed banks have an 8.5% point lower fraction of funds affiliated with their new bank. This means that customers who supposedly have experienced an even larger shock to their risk aversion and trust (due to their old banks going bankrupt) do not move larger fractions of their original fund investments to funds affiliated with their new banks, compared to customers being moved as a result of a less distressed bank merger.

Extensive margin

We conduct two tests of whether customers in failed banks have a higher tendency to sell their fund investments all together after the failure of their old bank (extensive margin). First, in column (5) of Table 5, we show results for the number of mutual funds held in total. Four years after the take-over, there is no difference between customers in banks that went bankrupt and banks that merged, i.e. customers in failed banks do not hold a lower number of funds than customers in merged banks. Second, we estimate a probit model where we investigate whether customers in bankrupt banks are more likely to sell all of their fund investments (have zero investments in funds after the bankruptcy of their old bank). To save space, results are available upon request. We find that there is no significant difference between customers in the three bankrupt banks compared to customers in the three banks that experienced a less distressed merger. In conclusion, customers experiencing a more dramatic take-over are not more likely to leave the fund market all-together after shifting bank. As a result, the switch to funds affiliated with customers' new bank seems difficult to explain by a bank-failure induced change in risk aversion or trust of the treated customers.

Finally, we note here that in Section 8, where we study voluntary bank shifts, we find additional support suggesting that investors do not shift funds following bank shifts because they lose trust in advice given by their old bank

7.1.2. Treated banks sold to multiple acquires

We have shown that investors shifting funds after a bank switch are largely no different from investors who do not switch bank, nor that they shift funds because their risk aversion or trust has changed. We now slice our sample of treated banks in a different dimension to provide an even more powerful test (though on a smaller subsample of individuals) of the hypothesis that the decision to shift funds is driven by the distribution channel and not by differences in individual characteristics.

Four of the treated banks were (each) sold to one acquiring bank. The remaining were (each of them, separately) sold to multiple acquiring banks. In these latter cases, different acquiring banks bought different branches of the failed banks. The interesting feature here is that some of the acquiring banks have directly affiliated funds while others have not, see Appendix A. Given that the split of customers to different banks was based on branch locations, this is as close to a random split of the treated customers as it gets.

The results are in Table 6. The results are largely similar to the ones we have presented earlier. Customers who were moved to a bank with an affiliated fund family reallocated a much larger fraction of their investments to funds affiliated with their new bank than did customers originally in the same failed bank but who were moved to banks with no direct affiliated fund. We believe this is clean and strong evidence that the distribution channel is a prime driver of investors' choice of funds.

7.2. Chasing fund ratings

Investors might be attracted to funds affiliated with their new bank because these funds are better rated. To investigate this, we look at the overall Morningstar rating of the funds. The Morningstar rating is a particularly useful measure in our analysis that studies choices of retail investors, as Morningstar ratings are readily available to retail investors and easily understood. Del Guercio & Tkac (2008), Khorana & Servaes (2012), and Ben-David et al. (2019) show that these ratings are important drivers of mutual fund flows of retail investors. The Morningstar rating is based on historical performance (after fees) of a fund compared to other funds within the investment category of the fund. Morningstar ratings range from one (the fund is among the ten percent of funds within the investment category that has had the historically worst performance) to five (the fund is among the ten percent of funds within the investment category that has had the

historically best performance). We use the main Morningstar rating, i.e. the overall rating, which is a weighted average of the rating of the past 3-year, 5-year, and 10-year performance of a fund, depending on lifetime of the fund.¹⁹ We calculate for each investor her value-weighted rating, using those funds where ratings are available.

We conduct our analysis in two steps. First, we investigate whether investors end up with portfolios of funds that are on average better rated than the ones investors held before their switch of bank. Second, we study investors' tendency to buy high-rated funds before and after the shift of bank/distribution channel.

7.2.1. Do investors end up with better-rated funds?

Figure 4 shows the average Morningstar rating of mutual funds in the portfolios of individuals who are forced to switch bank due to a takeover, before and after switching bank, i.e. customers in the six treated banks. The figure reports averages across all affected fund holders' portfolios. The figure is based on around 10,000 individuals, which corresponds to the app. 12,500 fund holders forced to switch (Table 3) minus those for which data on ratings are missing.²⁰ The figure reveals that investors end up with lower rated funds than the ones they held before their switch of bank.

This conclusion is robust in regression settings where we control for background characteristics of the individuals (age, gender, etc.) and year fixed effects. The results are in Table 7, column (1), where we show results from tests of whether investors after the switch end up with better-rated funds than otherwise similar investors. This is the regression version of Figure 4. We show in Table 7 the constant and the coefficient to the interaction effect of a dummy picking out individuals forced to switch bank and a dummy equal to 1 in all four years after the merger of banks. The constant in column (1) measures the average rating of funds held by investors not switching bank, i.e. investors in the control group. The average rating of funds held by investors in the control group is 2.91, close to the average rating of three for Morningstar-rated funds.

¹⁹ Ratings are not available for new funds, as they obviously have no historical performance. The funds must have existed for at least three years before Morningstar rates it. Similarly, a fund must have existed for at least five years before a Morningstar rating based on past 5-year performance can be calculated. If a fund has existed for, e.g., four years, the overall rating consists of the three-year rating.

²⁰ We calculate standard errors clustered by individuals and plot the corresponding 1% confidence intervals of the pre- vs. post difference (hardly visible due to tightness).

The average rating of funds held ex post by investors experiencing a shift in the distribution channel is -0.49 rating notches lower than that of otherwise similar investors.

7.2.2. Do investors chase better-performing funds at the time of purchase?

The finding that forced switchers do not end up holding better-rated fund portfolios does not necessarily mean that investors are not trying to purchase good funds.

Del Guercio & Tkac (2008), Khorana & Servaes (2012), and Ben-David et al. (2019) document a strong influence of Morningstar ratings on fund flows. We find that Danish investors generally have a strong preference for high-rated funds, too. Figure 5 shows the distribution of ratings of bought funds across all investors during our entire sample period. The figure shows that Danish investors behave similarly to the US investors that Del Guercio & Tkac (2008), Khorana & Servaes (2012), and Ben-David et al. (2019) study. For instance, only 3% of all fund purchases are one-star rated funds, whereas 17% of all purchases are five-star rated funds. Similarly, 16% are purchases of one- and two-star rated funds, versus 45% purchases of four- and five-star rated funds. The average rating of a bought funds is 3.45. This is statistically significantly higher than the average Morningstar rating of all funds. As robustness, we find in unreported results (available upon request) that the tendency to buy high-rated funds holds year-by-year, and if looking at value-weighted purchases, too. In conclusion, our investors generally have a strong tendency to buy high-rated funds, in line with results based on US data in Del Guercio & Tkac (2008), Khorana & Servaes (2012), and Ben-David et al. (2019).

Let us now examine how an exogenous shock to the distribution channel of mutual funds affects the tendency to buy high-rated funds. In Figure 6, we look at purchases of mutual funds for our treatment group of forced switchers, before and after they switch bank. We distribute the purchases into purchases of funds with one Morningstar rating (worst historical performance), two-star rating, etc., and up to purchases of five-star rated funds. The figure reveals a striking finding.

Before the switch of distribution channel, investors in our treatment group have a clear preference for buying high-rated funds, like the general population (Figure 5). Before the switch, 80% of purchases were four- and five-star funds versus 6% one- and two-star funds. After the switch, people still prefer buying highly rated funds, though people buy relatively fewer of the very best funds. More precisely, after people have been forced to switch bank, relatively fewer

new fund purchases are 4- and 5-star funds (drops to 46%) and relatively more purchases are in 1- and 2-star funds (increases to 21%). In conclusion, people prefer high-rated funds to low-rated funds, also after the switch, but the otherwise strong tendency to buy the very best-rated funds is reduced after the switch.

This result is confirmed in Table 7 where we control for background characteristics. In column (2), we look at all the funds forced switchers buy after their switch of bank and in column (3) we look at purchases of funds affiliated with their new bank. The constant in the regressions show the average rating of newly bought funds for investors not switching bank, i.e. the control group. The average is 3.54 (column (2)). This is higher than the constant in column (1), revealing that investors not experiencing a shift in the distribution channel buy high-rated funds. Investors forced to shift bank do not trade in this way. The average rating of newly-bought funds by investors experiencing a shift in the distribution channel is 0.56 rating notches lower than the rating of newly bought funds by investors in the control group. The results in columns (3) are almost the same, as forced switchers generally buy funds from affiliated funds. We conclude that investors do not switch bank to get higher-rated funds. In fact, after the switch people buy relatively lower rated funds.

7.3. Performance after switch

The advantage of looking at Morningstar ratings is, as mentioned, that they contain information that investors rely upon when making fund investment decisions. On the other hand, Morningstar ratings do not fully capture the welfare gains from switching funds. In this section, we look risk-adjusted returns (Sharpe's ratio), fees, and portfolio concentration (as a measure of portfolio diversification) of investors' fund portfolios. We calculate Sharpe's ratio as returns divided by standard deviation, i.e. assuming a risk-free rate of zero. Fees are the Annual Net Expense Ratios (percentage of fund assets paid for operating expenses and management fees). Sharpe's ratios and fees are calculated as the AUM weighted average of the Sharpe's ratios and fees of the individual funds in the portfolio of investor i . To measure portfolio concentration, we calculate for each investor the Herfindahl-Hirschman Index (HHI), i.e. the sum of squared portfolio weights: If an investor has 50% in each of two funds, $HHI = (0.5^2) \times 2 = 0.5$. The lower is HHI, the less concentrated is the portfolio.

Table 8 shows the results from the Dif-in-Dif regressions of Eq. (1). The table reveals that after their switch of bank, forced switchers hold portfolios that are more concentrated (less diversified), but with a higher Sharpe ratio and lower fees, compared to the control group. The economic magnitudes are small, though. For instance, the average Sharpe's ratio across treated investors and investors in the control group is around 1.5 (1.45 for treated and 1.58 for control). In this light, a four basis points increase (Column 1 in Table 8) in the Sharpe ratio is economically miniscule. Similarly, fees paid by forced switchers are seven basis points lower after the switch compared to non-switchers (Column 2). These lower annual fees have to be compared with the one-time transaction costs resulting from selling old funds and buying new. We cannot see these transaction costs in our data, but we know that the cost of selling one mutual fund and buying a new one amounts to 2-4% of invested wealth.²¹ In this light, the annual seven basis points reduction more than cancels out. Lastly, in column (4), we compare the realized returns investors have obtained after they are forced to switch bank to the hypothesized return they would have obtained had they counterfactually kept the portfolio they held one year before they switched bank. Given that people in general may get better returns if they regularly reoptimize their portfolios, we compare this to the same difference for non-switchers, i.e. the actual return of investors in the control group (non-switchers) minus their hypothesized return if they had kept the same portfolio as they held in 2007. Column (4) shows that the extra return treated investors have realized, over and above what they would have obtained had they not switched portfolios, is 0.26% higher than that of the control group. This hypothetical return is not risk-adjusted, however, which the Sharpe's ratio is, and is before taking transaction costs into account.

We conclude that – after switching bank and as a consequence choosing to reallocate funds – people end up with more concentrated and marginally lower-rated portfolios. Any improvement in performance or lowered fees we observe is economically negligible, in particular when considering the transaction costs of churning the portfolio.

7.4. Other advantages

Investors might save on other products bought in the bank, if investors buy affiliated funds. This could be lower fees when trading securities, better deposit/lending interest rates, lower fees on

²¹ Bechmann & Rangvid (2007) show that Front-end load fees in Danish mutual funds typically amount to 1.5-2.5% and back-end load fees around 0.2-0.8%. In addition, brokerage fees add something like 0.5-1% to the sum of the load fees.

other transactions with the bank, etc. Typically, customers are able to obtain such advantages if they become eligible for ‘preferred customer’ plans. We cannot see in our data whether a customer is a ‘preferred customer’, but we have screened the requirements to become a ‘preferred customer’. Generally, two requirements must be fulfilled: The total activities of a customer with the bank must exceed a certain threshold, and the customer must have bought a certain number of products from the bank. Total activities are the sum of the customer’s deposits by the bank, bank loans, mortgage loans, etc. The value of an individual’s assets held in her depot counts as well, including the value of mutual funds. All funds count, however, i.e. it does not matter whether funds are from fund families affiliated with the bank or from other fund families. This, thus, cannot explain the portfolio turnovers that we see. The second requirement regarding the number of bought products is typically specified such that the customer needs to have bought, e.g., 5 out of 15 products to become a preferred customer. One of the 15 criteria might be that the customer owns funds from the affiliated fund family. There is no requirement regarding the value of affiliated funds, though. This is a requirement on the number of products, not the value. Hence, the customer can help fulfill this criterion by buying affiliated funds for a small amount. There is no reason that the customer churns 35%-40% of her mutual fund holdings, and pay associated transaction costs, to fulfill one of the many criteria needed to become a preferred customer. The conclusion is that such considerations cannot reasonably explain the large turnover we observe.

In total, this section has shown that the main characteristic explaining fund turnover is the passing of time, not investor characteristics. Our interpretation is that as time passes by, the customer at some point gets in contact with her bank advisor. The advisor convinces the customer to churn her complete fund portfolio. Chasing of fund ratings or fund performance cannot explain the portfolio turnover. Instead, the distribution channel has a strong influence of investors’ choice of funds.

8. All joiners and leavers

We have until now studied a sample of investors forced to switch bank because their old bank merged with another bank. The advantage of looking at the sample of forced switchers is that we examine exogeneous variation in bank relationships. There is nothing, though, that prevents us from studying a larger sample consisting of all investors switching between the six banks

reported in Panel A of Table 1. Most of these switches are probably not exogenous. They provide us with other insights, though. First, switches between these banks are switches between banks that survived the financial crisis. Studying these helps shedding light on the hypothesis that investors in failed banks transfer a loss of trust in their old bank, as a consequence of the bank failure, to the advice received from the old bank, and subsequently decide to sell funds that they bought upon the advice from their old bank. It is important to stress, though, that there is generally no reason to believe that bad management of a bank should be associated with bad performance of a mutual fund, as these are separate legal entities. Nevertheless, the investor might lose trust in the advice she received from the old bank, and churn her portfolio as a result.²² If one believes that investors in failed banks only shift mutual funds because they lose trust in their old bank, we should not see investors in strong banks shifting funds after they voluntarily shift bank. Second, these cases provide us with an opportunity to investigate directly what happens to investments in funds affiliated with the old bank. This is not directly possible for the acquired banks studied in the previous sections of the paper, as these failed banks did not have a clear affiliation to one mutual fund.²³

To establish a well-defined time of switching, we study those individuals who hold mutual funds both before and after the switch and who change bank once within our 2005-12 sample period. 78% of the individuals never switch during 2006-12 (we need one initial year, i.e. 2005, before we can identify a switch), 17% switch once, the rest switches twice or more. In other words, almost a quarter of customers shift bank during a 7-year period.

Table 9 shows the results. Panel A shows results for customers joining one of the six banks of Panel A of Table 1, whereas Panel B shows results for customers leaving one of those banks. The numbers of joiners and leavers need not add up, as some might join a bank because they turn 18 or enter the country, whereas some might leave a bank because they die or leave the country. In addition, even when our six banks account for more than 70% of all depositors in

²² Sialm & Tham (2016) show that investors react to the performance of a management company even when this performance is unrelated to the performance of the funds investors hold. One might similarly hypothesize that investors react to the performance of a bank, even when this is unrelated to the performance of the funds affiliated with the bank.

²³ It is not possible to determine the contract that each of the failed banks had with certain mutual funds. For this reason, it is not possible either to identify links between each of the failed banks and mutual funds that they had incentives to guide customers towards.

Denmark, as mentioned in Section 4, there will be customers leaving these six banks in favor of a bank not included in our working sample (and customers leaving banks outside our working sample and joining our six banks).

The occurrence of a switch is dated time t .²⁴ We observe the first switch in 2006, and we can follow holdings up to 2012, i.e. up to time $t+6$. The last switch occurs in 2012, and we can follow holdings back to 2005, i.e. back to time $t-7$.

The qualitative conclusions regarding the investors joining a new bank (Panel A) are similar to those reported earlier for forced switchers. After customers have switched to a new bank, there is a massive increase (i) in the number of investors holding funds affiliated with their new bank, (ii) in the number of funds from the affiliated funds, and (iii) in the value invested in funds affiliated with the new bank, compared to the period before joining. For instance, six years after joining a new bank, 69.4% of new customers own funds affiliated with their new bank, 56.6% of fund holdings are in the new affiliated funds, and 57.8% of the value of mutual fund investments is invested in new funds affiliated with the customers' new bank, up from pre-switch averages of app. 15%, 10%, and 10%, respectively.²⁵

We can compare these flows to flows in general, i.e. to flows for investors not shifting bank. Using the data underlying Table 9, we find that the average annual addition of affiliated funds is DKK 29,267 for an individual person who has shifted bank. This is calculated using years $t-1$ to $t+6$ for investors shifting bank and dividing by 6.5 years (switch is on average in the middle of the year). For non-switchers, we find an average annual increase of DKK 13,364. Mutual fund

²⁴ We have end-of-year data, but people switch banks throughout the year. On average, people have been at a new bank for 6 months at time t . This means that we would expect some new-bank effect to have occurred already at the end of year t , as also seems to be the case in Table 9. This contrasts most forced switches, that we investigated in the previous sections, as takeovers tend to happen towards the end of the year (see Appendix), and we thus see no new-bank effect before time $t+1$ in Table 3.

²⁵ One might wonder why the fractions of funds and total value invested in funds affiliated with customers' new bank before joining their new bank is higher at 10-13% relative to other banks (around 2%). First, there is a tendency that people hold funds from the biggest mutual funds, Danske Invest and Nordea Invest, even when they are not customers there, simply because Danske Bank and Nordea are widely known, as they are the largest banks. In addition, as Danske and Nordea are the biggest banks, most switches also occur between these banks (we are not allowed to report the detailed numbers, as these are only two banks). So, when people switch to those banks, the pre-switch average is intuitively already quite high, but then also becomes higher after the switch. Second, people might tend to switch to banks that are affiliated with the mutual funds they already hold, i.e. endogenous bank switch.

flows following bank shifts are thus considerably higher than flows outside periods following bank shifts. So, bank shifts are not rare, and the flows following them are large. These flows constitute an important source of total mutual fund flows of retail investors.

Panel B shows what happens to investments in funds associated with the bank the customer has left. The results mirror those of Panel A. Before leaving, most investors invest in affiliated funds, most of the funds they own are from affiliated funds, and most of their wealth in mutual funds is in affiliated funds. After they leave, the number of investors investing in the funds affiliated with their old bank falls, they hold fewer funds from funds affiliated with their old bank, and the wealth invested in funds affiliated with the old bank falls substantially. We illustrate these effects in Figure 7.

We have estimated these effects in controlled regressions. The regressions confirm that the findings visualized in Figure 7 are economically and statistically significant, i.e. investors increase their holdings of funds affiliated with their new banks after the switch and reduce their holdings affiliated with their new bank. To save space, the results from these regressions are available upon request.

The results in this section, even if not based on exogeneous variation in the distribution channel, tell us that mutual fund flows of forced switches (i.e. customers in merged banks) most likely do not happen because these customers lose trust in recommendations given by their old now-failed bank. If this was true, we should have seen that the effects for forced switches are significantly larger than for customers voluntarily switching between generally healthy banks. This is not what we find. We find instead that mutual fund flows following voluntary shifts of bank are as large as flows following forced shifts. Second, these results show that customers sell funds affiliated with their old bank and buy funds affiliated with their new bank, providing even more direct evidence on this than in Section 6.

The results of this section also tell us about the aggregate impact of the distribution channel, as we here analyze most mutual fund investors in the country. Figure 7 shows that close to 50% of the total mutual fund investments of a customer have been moved to funds affiliated with their new bank six years after switching bank. We know from the static analysis in Section 5 that around 70% of all mutual fund investors' total mutual fund investments are in funds affiliated

with their bank. The analysis of this section (together with Section 6 that demonstrates causality) implies that around 35%-50% of a customer's mutual fund holdings are shifted from one mutual fund to another, following a shift in the distribution channel. This means that at least 35%-50% of the 70% in funds affiliated with your bank, which translates into 25%-35% of households' total mutual fund choices, are determined by the distribution channel. We conclude that the distribution channel accounts for at least a third of mutual fund flows at the macrolevel.

9. Conclusion

We identify the importance of the distribution channel for mutual funds. When customers shift bank, a new distribution channel for mutual funds affiliated with customers' new bank becomes available. We study mainly customers forced to switch bank because their old bank failed following the financial crisis in order to get exogenous variation in the distribution channel. Our main contributions are three-fold. First, we establish a causal relation between the distribution channel of mutual funds and customers' choice of mutual fund and we quantify the importance of the distribution channel. We find that at least a third of investors' mutual fund choice is driven by the distribution channel. Second, we document the dynamics of flows after a shift in the distribution channel. Finally, we investigate why people reallocate funds.

Overall, our results show that investors do not shift funds to improve their fund portfolios, in particular when taking into account transactions costs. Instead, people shift funds because they get exposed to a new distribution channel, and as the years pass by, more investors shift. Our interpretation is that different people get in contact with their new bank advisor at different points in time, and when they do, their advisor is able to convince them to switch funds, even when there is no observable good reason to do so.

We use bank failures to get exogeneous variation in the distribution channel. This does not mean that the distribution channel is at work only when a bank fails or when banks generally experience exogenous shocks. The high fraction of static holdings in affiliated funds among non-switchers is testimony to this fact. Rather, we use bank failures in our research design to identify the importance of the distribution channel, i.e. to analyze exogenous variation in the distribution channel, and to rule out confounding effects.

In a similar vein, our results speak to the choice of funds among different fund providers. Our results show that the distribution channel determines where you buy your funds, and it often dominates other potential explanations. This is important because the literature commonly models investors' fund choices as based solely on risk-return preferences. Our results show that the distribution channel in itself is an important determinant of the funds people buy.

Finally, our study deals with retail investors. It would be interesting to examine whether the same applies to other types of investors. For instance, some institutional investors use external consultants in their search for fund managers. It is a worthy topic for future research to examine the impact of an exogenous shock to the distribution channel of institutional investors (e.g., companies that search the market for fund managers), and see whether the impact is as large as for retail investors.

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Figure 1. Development of Fund Holdings Affiliated with Customers' New Bank

Figure 1a shows the value of mutual fund holdings in funds affiliated with switchers' new bank and the average value held in funds affiliated with non-acquiring banks. Holdings are normalized to be 100 in year $t-1$, where year t is the year of the bank switch. Figure 1b shows the proportion of individuals who have 0-10%, 11-90%, and 91-100% of their value of mutual fund holdings in funds affiliated with their new bank. This is shown separately for the merger year (year t) and four years after the merger (year $t+4$). For example, 98% of individuals have 0-10% of their value of mutual fund holdings in connected funds in the merger year, which drops to 50% of individuals four years after the merger.

Figure 1a. Affiliated Holdings over Time

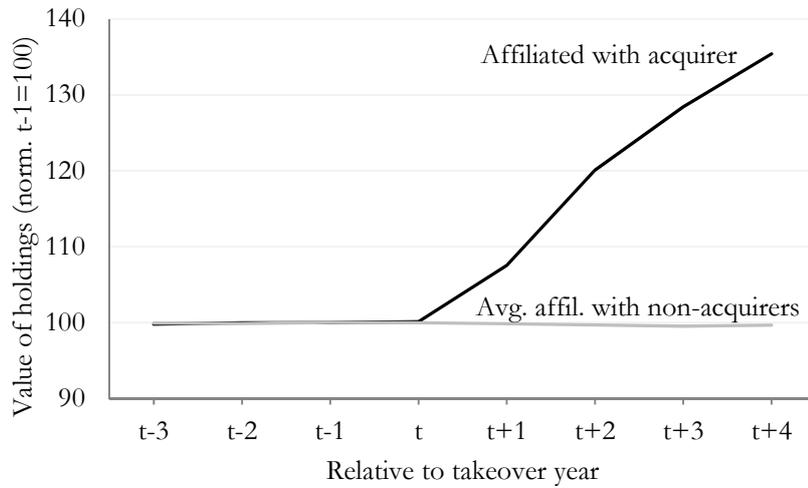


Figure 1b. Fraction of Investors with Low/Middle/High Allocation in Affiliated Funds

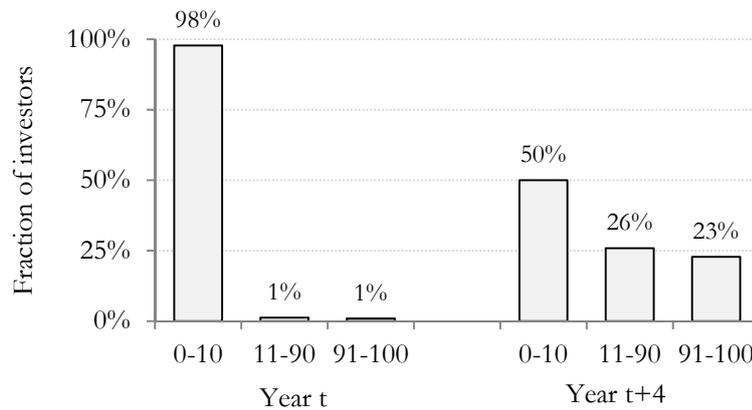


Figure 2. Affiliated holdings

Figure 2 shows A) number of individuals and B) value of mutual fund holdings for depositors in the six banks listed in Table 1 in 2012. The same information is outlined year-by-year in Table B in the Appendix, although the proportion held in affiliated mutual funds need not correspond to the fraction of the two corresponding numbers reported in Table B (i.e. $309,587 / 436,139 \neq 68.7\%$) because Table B reports the average of fractions (68.7% is the average fraction across individuals) whereas from Figure 2B one can calculate the fraction of averages ($309,587 / 436,139 = 71.0\%$ is a fraction calculated from average holdings across individuals).

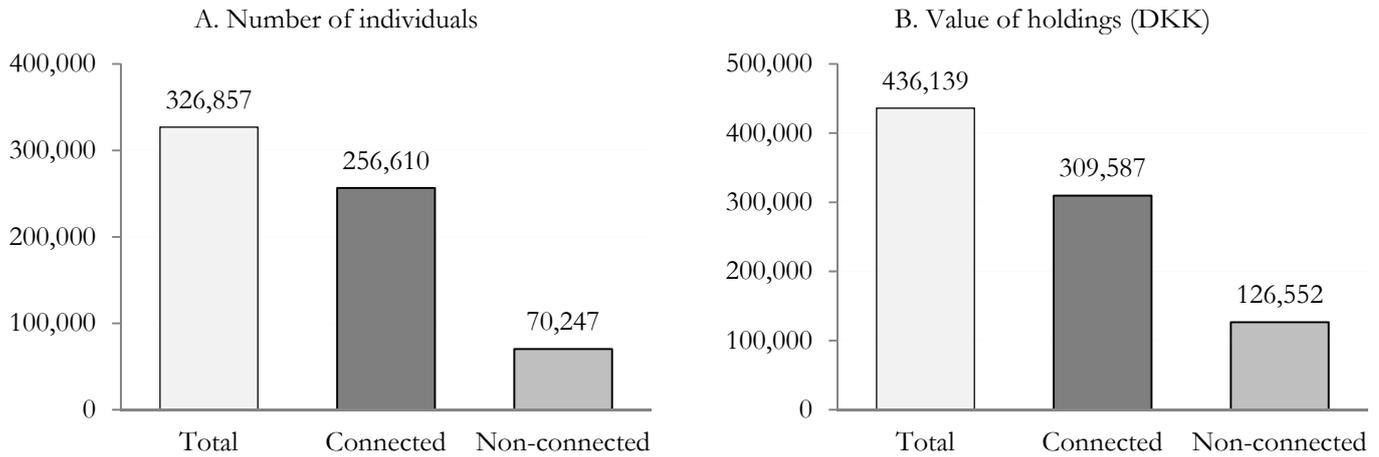


Figure 3. Distribution of Connected Holdings over Time

The figure shows the proportion of individuals that have 0-10%, 11-20%, ..., 91-100% of their value of mutual fund holdings in funds that are affiliated to their new bank. This is shown separately for the merger year (year *t*) and each available year thereafter. For example, 98% of individuals have 0-10% of their value of mutual fund holdings in connected funds in the merger year, which drops to 50% of individuals four years after the merger.

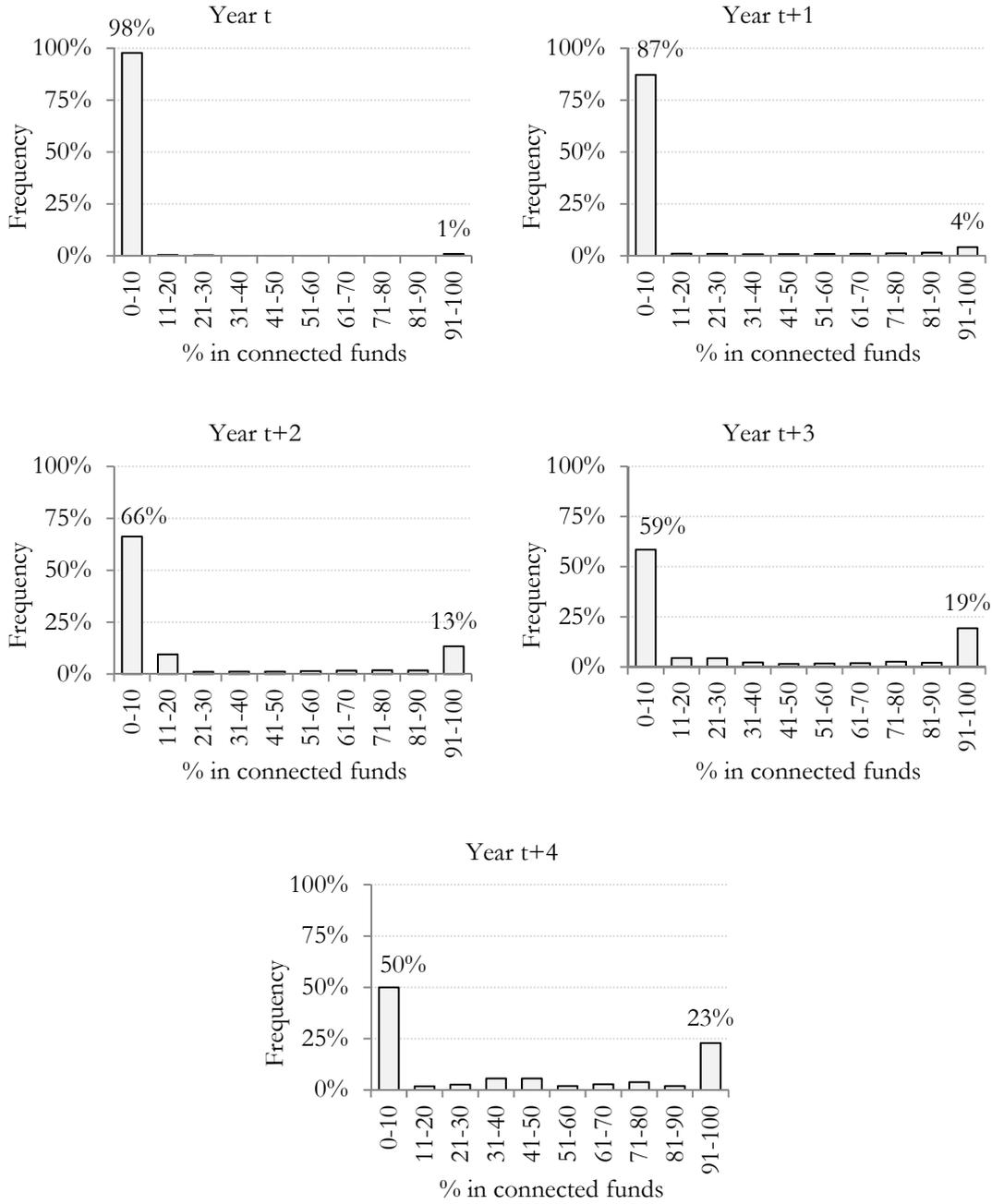


Figure 4. Ratings for Forced Switchers

The figure shows average portfolio Morningstar ratings for individuals who are forced to switch to another bank due to takeover. The statistics are shown before and after the switch, as well as the difference between the two. The ratings are calculated as a value-weighted average for each individual portfolio (among funds where a rating is available) for each year. From these annual portfolio ratings we calculate pre- and post-switch averages for every fundholder, and thereafter calculate and report in the figure the pre- and post-switch average across all individual fundholders' portfolios. Relative to takeover year t , the post-switch period is years $t+1, \dots, t+4$, and the pre-switch period is years $t-3, \dots, t$. There are 10,267 observations from which the pre-switch average ranking is calculated (i.e. number of fundholders holding portfolios that have funds with available ranking data), and 9,282 observations from which the post-switch average is calculated. For the difference statistic we calculate standard errors clustered by individuals and plot the corresponding 1% confidence intervals (hardly visible due to tightness).

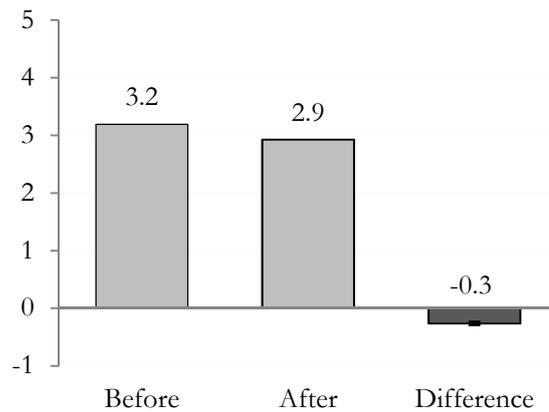


Figure 5. Rating Choices of Population

The figure shows the fraction of fund purchases across the whole population in respectively rated funds over the sample period 2005-12. For example, 39% of all fund purchases in 2005-12 were in 3-star rated funds. The ratings are calculated across all fund purchases, where the average rating is 3.45.

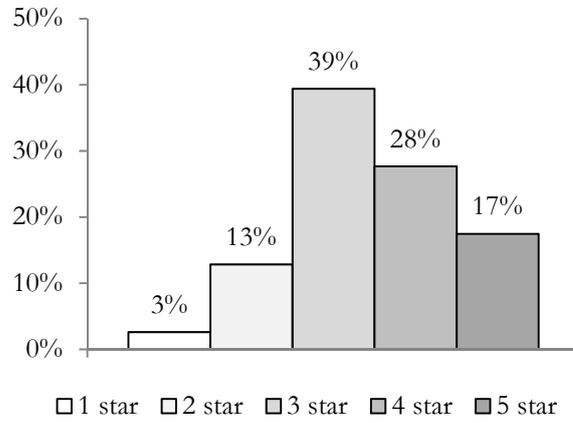


Figure 6. Performance Choice at Time of Trade

The figure shows the proportion of purchases that are made in each 1-5 category of Morningstar rated funds before and after an exogenous bank switch (using the end-of-year rating prior to purchase). Relative to takeover year t , the post-switch period is years $t+1, \dots, t+4$, and the pre-switch period is years $t-3, \dots, t$. We count the number of specific star purchases and the total number of purchases (approx. 16,000 pre- and 27,000 post-purchases) and take a simple ratio of those two numbers (implying no distribution/inference).

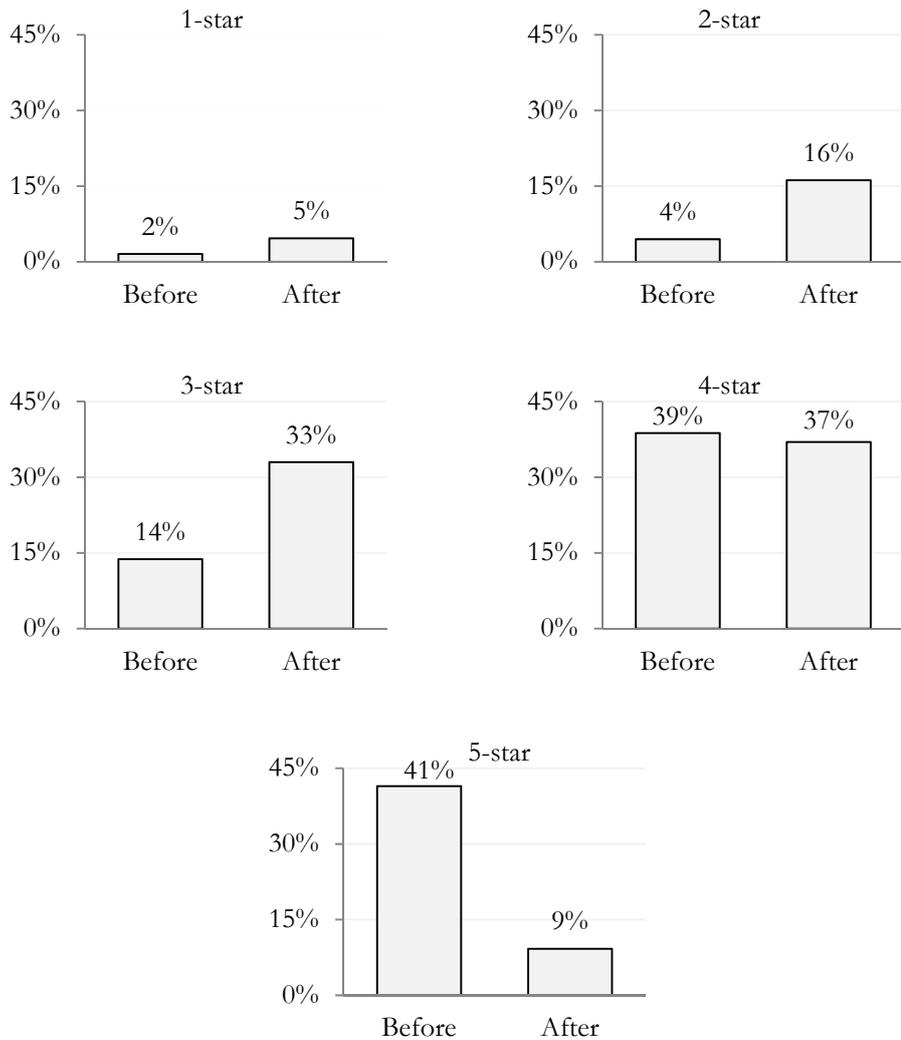


Figure 7. Affiliated Holdings over Time: All Bank Switches

The figure visualizes the key results from Table 9. It shows - separately for all mutual fund holders either joining or leaving banks - the evolution of i) the proportion of portfolio value that is affiliated with their old/new bank and ii) the average value of funds affiliated with neither their old nor new bank (e.g. if a person switches from Bank A to Bank B, this shows the average holding in non-BankA and non-BankB mutual funds). Holdings are normalized to be 100 in year $t-1$, where year t is the year of the bank switch.

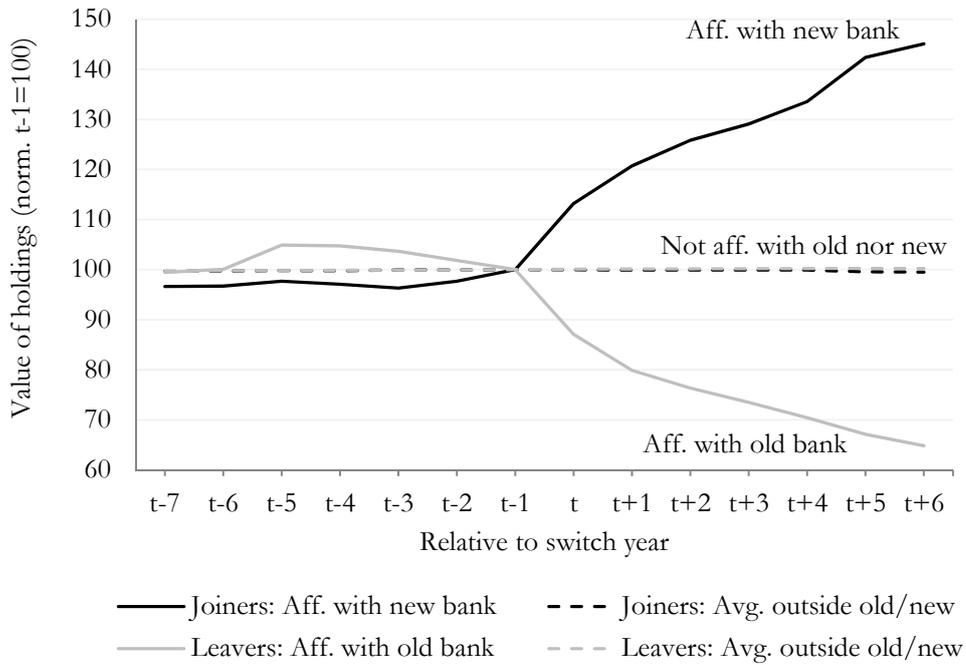


Table 1. Banks and Mutual Fund Families

Panel A alphabetically lists the banks operating in Denmark that i) are affiliated with a mutual fund association and ii) acquire a bank during the 2005-12 sample period. Additionally, the largest Danish bank, Danske Bank, is included. Panel A also lists the mutual fund family associated with each bank. Panel B shows the number of depositors at year-end 2012 i) in the six banks listed in Panel A, ii) in all other banks, and iii) the country total. Similarly, Panel B shows the number of fundholders i) in the six mutual fund families listed in Panel A, ii) in all other funds, and iii) the country total. The data is restricted to individuals above the age of 17.

Panel A.

	Bank	Mutual fund family
1	Danske Bank	Danske Invest
2	Handelsbanken	Handelsinvest
3	Jyske Bank	Jyske Invest
4	Nordea Bank Danmark	Nordea Invest
5	Nykredit Bank	Nykredit Invest
6	Sydbank	Sydinvest

Panel B.

	Bank			Mutual fund family	
	Depositors	%		Fundholders	%
In banks 1-3	1,573,291	37.1%	In fund families 1-3	203,697	46.5%
In banks 4-6	1,320,452	31.1%	In fund families 4-6	161,804	36.9%
In all other	1,347,972	31.8%	In all other	72,777	16.6%
Country total	4,241,715	100%	Country total	438,278	100%

Table 2. Summary Statistics: Mutual Fund Holders

The table shows means and standard deviations (in parentheses below means) on all mutual fund holders (those owning at least one mutual fund) who are above the age of 17 and were registered in Denmark, for 2005 and 2012. “Exogenous Bank Switchers” are those mutual fund holders who are depositors in one of the acquired banks detailed in Table A in the Appendix. “Control sample” are fund holders who are depositors in one of the six acquiring banks detailed in Panel A of Table 1. All variables presented in Danish kroner are inflation adjusted with August 2016 as base. Higher education is defined as those with a university bachelor degree or higher. The children-in-household dummy equals one if the household includes children younger than 25 years old that live at home and are unmarried. Immigration dummy is equal to one for foreign nationals with a registered immigration date. The income variable is defined as total income before taxes. This includes regular salary, pension, public income transfers, irregular income (e.g. honorary income, consulting income, etc.), income from self-owned firm, capital income, foreign income, etc. Net overall wealth is net wealth at year-end, excluding pension savings. All other registered wealth is included (i.e. only excludes private cash holdings and private debt), such as net registered property value (value of motor vehicles and boats is unregistered). Net house wealth is calculated as the year-end value of residential housing as evaluated by tax authorities minus the market value of bond debt. Variables in DKK terms are winsorized within each year at the bottom 0.1 and top 99.9 percentiles.

	2005			2012		
	All fund holders (N = 525,955)	Control sample: Fundholders offered affiliated (N = 315,330)	Treatment sample: Exog. Bank Switchers (N = 12,567)	All fund holders (N = 438,278)	Control sample: Fundholders offered affiliated (N = 277,999)	Treatment sample: Exog. Bank Switchers (N = 11,114)
Age	57.8 (17.7)	59.5 (17.1)	56.9 (17.5)	59.6 (17.9)	61.0 (17.8)	61.2 (16.3)
Female dummy	0.51 (0.50)	0.51 (0.50)	0.50 (0.50)	0.51 (0.50)	0.52 (0.50)	0.50 (0.50)
Married dummy	0.51 (0.50)	0.51 (0.50)	0.52 (0.50)	0.51 (0.50)	0.50 (0.50)	0.53 (0.50)
Higher educ. dummy	0.10 (0.30)	0.10 (0.30)	0.09 (0.28)	0.13 (0.34)	0.13 (0.33)	0.12 (0.33)
Children in housech. dummy	0.19 (0.39)	0.17 (0.38)	0.19 (0.39)	0.20 (0.40)	0.18 (0.38)	0.18 (0.38)
Immigration dummy	0.01 (0.09)	0.01 (0.09)	0.00 (0.07)	0.01 (0.09)	0.01 (0.09)	0.01 (0.07)
Income	327,931 (291,974)	327,819 (295,191)	331,197 (2,892,354)	346,113 (328,538)	341,735 (3,514,782)	342,607 (2,960,218)
Net overall wealth	1,543,212 (2,999,734)	1,647,394 (3,212,286)	1,648,348 (2,892,354)	1,641,136 (3,300,027)	1,746,318 (3,514,782)	1,633,419 (2,960,218)
Net house wealth	766,494 (1,383,634)	823,120 (1,430,884)	786,708 (1,437,218)	791,582 (1,606,236)	839,658 (1,636,852)	775,092 (1,588,597)
Value of funds	399,670 (723,900)	426,009 (757,298)	384,806 (706,417)	404,727 (855,963)	438,124 (907,971)	410,660 (789,674)
No. of funds	2.74 (2.50)	2.95 (2.66)	2.79 (2.79)	3.45 (3.26)	3.65 (3.33)	3.66 (3.86)

Table 3. Exogenous Bank Switches

The table shows the number of individuals holding mutual funds, the average number of funds held and the value of those. In Panel A, affiliated funds are those issued by a mutual fund association that is associated with switchers' (soon-to-be) new bank, and similarly in Panel B it is funds associated with non-switchers' ongoing bank. Also reported in Panel A is the average fraction held in funds that are affiliated with a non-acquiring bank, i.e. the average fraction held in funds affiliated with banks 1-6 in Table 1 when excluding the acquiring bank. Similarly, Panel B reports the average fraction held in funds affiliated with banks 1-6 in Table 1, other than your own ongoing bank. In the last column, we show and test the difference in holdings between periods $t-3$ and $t+4$, where statistical significance of the difference is reported at the 1% level (star-marked*). The statistical difference in the number of individuals cannot be tested since there is no underlying distribution.

Panel A. Treatment group: Forced switchers

	Relative to takeover year t								Stat. diff.
	$t-3$	$t-2$	$t-1$	t	$t+1$	$t+2$	$t+3$	$t+4$	$t-3$ vs. $t+4$
<i>Number of individuals</i>									
Holding mutual funds	12,577	13,429	13,295	12,536	11,476	9,788	8,969	5,923	
Fraction of indiv. with funds aff. to acquirer	1.9%	2.1%	2.3%	2.6%	13.4%	35.6%	42.5%	50.5%	
<i>Number of holdings (conditional on holding any)</i>									
Total	2.90	3.30	3.41	3.37	3.61	3.76	3.79	4.02	1.12*
Fraction of funds affiliated with acquirer	1.2%	1.3%	1.4%	1.5%	8.6%	20.8%	28.8%	34.4%	33.3%*
Avg. fraction aff. to a non-acquiring bank	3.3%	3.2%	3.4%	3.4%	3.2%	3.0%	2.8%	2.9%	-0.4%*
<i>Value of holdings (conditional on holding any)</i>									
Total	388,219	460,972	370,781	292,268	343,345	369,929	389,390	452,841	64,622*
Fraction of value affiliated with acquirer	1.1%	1.3%	1.3%	1.4%	8.9%	21.4%	29.7%	36.7%	35.6%*
Avg. fraction aff. to a non-acquiring bank	3.1%	3.1%	3.2%	3.2%	3.1%	2.9%	2.7%	2.9%	-0.3%

Panel B. Control group: Non-switchers

	Calendar year								Stat. diff.
	2005	2006	2007	2008	2009	2010	2011	2012	2005 vs. 2012
<i>Number of individuals</i>									
Holding mutual funds	315,330	344,675	327,792	302,852	293,764	292,476	284,954	277,999	
Fraction of indiv. with funds aff. to bank	72.7%	75.2%	82.6%	82.8%	82.2%	82.7%	83.0%	83.1%	
<i>Number of holdings (conditional on holding any)</i>									
Total	2.95	3.48	3.17	3.21	3.26	3.49	3.49	3.65	0.70*
Fraction of funds affiliated with bank	61.8%	63.1%	74.8%	75.2%	73.7%	74.0%	74.1%	73.7%	11.9%*
Avg. fraction aff. to other banks	1.3%	1.2%	1.4%	1.4%	1.5%	1.5%	1.5%	1.6%	0.4%*
<i>Value of holdings (conditional on holding any)</i>									
Total	426,009	651,333	396,106	307,566	352,879	401,201	389,692	438,124	12,115*
Fraction of value affiliated with bank	58.4%	60.2%	73.8%	73.8%	71.9%	72.7%	72.9%	73.4%	15.0%*
Avg. fraction aff. to other banks	1.2%	1.2%	1.3%	1.4%	1.4%	1.5%	1.5%	1.6%	0.4%*

Table 4. Exogenous Bank Switches: Regressions

The table shows estimates from regressions where the dependent variable is the 1) number of affiliated funds, 2) fraction of funds in affiliated funds, 3) value of affiliated funds, or 4) fraction of value in affiliated funds. The *ForcedSwitcher* variable takes value 1 for fundholders who are forced to a new bank that offers affiliated funds, where the underlying control group are those who always remain at the same bank (among banks in Table 1) in the 2005-12 sample period. The year of the bank switch is denoted as year t and all regressions also include dummies D_{t+1}, \dots, D_{t+4} that take value 1 in the respective post-switch period (estimates are not reported), otherwise zero. For the non-switching control group, we define the post-switch period as 2009-12. Control variables (age, gender, etc.) are defined in Table 2. Standard errors are clustered by individuals and corresponding t -statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	(1) No. aff. funds	(2) % aff. funds	(3) Value aff. funds	(4) % value aff. funds
Forced Switcher	-2.32* (-455.88)	-68.11* (-661.80)	-280,264* (-139.24)	-66.14* (-639.87)
Forced Switcher $\times D_{t+1}$	0.14* (14.13)	2.07* (9.43)	81,239* (38.97)	2.02* (8.97)
Forced Switcher $\times D_{t+2}$	0.51* (31.44)	15.14* (40.32)	107,202* (33.04)	14.96* (38.49)
Forced Switcher $\times D_{t+3}$	0.82* (40.14)	22.58* (50.71)	147,675* (37.62)	22.87* (49.73)
Forced Switcher $\times D_{t+4}$	1.06* (42.51)	28.94* (54.42)	163,215* (30.86)	29.56* (53.78)
Age	0.00* (12.24)	0.02* (5.80)	4,958* (84.74)	0.01* (2.87)
Female	-0.15* (-19.02)	-0.74* (-6.20)	11,227* (6.51)	-0.75* (-6.13)
Married	-0.05* (-7.34)	-1.73* (-15.04)	-95,953* (-63.02)	-1.67* (-14.06)
Higher educ.	0.08* (6.19)	-3.68* (-18.59)	13,779* (4.29)	-3.48* (-17.18)
Children in househ.	-0.27* (-26.72)	-2.81* (-17.06)	-10,359* (-5.97)	-2.55* (-15.12)
Immigrant	0.26* (6.05)	2.93* (4.50)	44,770* (5.66)	3.38* (5.10)
Income / 100,000	-0.00 (-1.16)	-0.20* (-10.31)	3,684* (6.43)	-0.15* (-7.85)
Net wealth / 100,000	0.01* (35.42)	-0.04* (-22.65)	5,328* (42.74)	-0.04* (-22.39)
Observations	2,528,774	2,528,774	2,528,774	2,528,774
R-squared	0.05	0.10	0.16	0.10
Number of indiv.	471,230	471,230	471,230	471,230
Year fixed effect	Yes	Yes	Yes	Yes

Table 5. Risk Aversion and Trust

The table shows estimates from regressions where the dependent variable is the 1) number of affiliated funds, 2) fraction of funds in affiliated funds, 3) value of affiliated funds, 4) fraction of value in affiliated funds, or 5) number of funds in general. The *Forced to failed bank* variable takes value 1 for fundholders who are forced to a new bank because their old bank has gone bankrupt. The underlying control group consists of those who are forced to switch bank as a result of an ordinary merger transaction. The year of the bank switch is denoted as year t and all regressions also include dummies D_{t+1}, \dots, D_{t+4} that take value 1 in the respective post-switch period (estimates are not reported), otherwise zero. Control variables (age, gender, etc.) are defined in Table 2. Standard errors are clustered by individuals and corresponding t -statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	(1) No. aff. funds	(2) % aff. funds	(3) Value aff. funds	(4) % value aff funds.	(5) No. funds
Forced to failed bank	0.07* (9.92)	1.97* (10.16)	6,082* (4.66)	1.83* (9.59)	-1.32* (-31.15)
Forced to failed bank $\times D_{t+1}$	0.36* (12.46)	2.87* (5.93)	29,378* (7.90)	3.02* (6.13)	-0.12 (-2.17)
Forced to failed bank $\times D_{t+2}$	-0.21* (-5.25)	-5.63* (-7.17)	-24,512* (-3.75)	-6.11* (-7.58)	-0.42* (-5.49)
Forced to failed bank $\times D_{t+3}$	-0.33* (-6.57)	-6.25* (-6.54)	-37,212* (-4.44)	-7.50* (-7.66)	-0.24* (-2.86)
Forced to failed bank $\times D_{t+4}$	-0.10 (-1.15)	-5.66* (-3.37)	-50,323* (-3.15)	-8.51* (-5.02)	0.15 (1.21)
Observations	99,163	99,163	99,163	99,163	99,163
R-squared	0.19	0.20	0.122	0.21	0.08
Number of indiv.	18,856	18,856	18,856	18,856	18,856
Control variables	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes

Table 6. Failed Banks with Multiple Buyers

The table shows estimates from regressions where the dependent variable is the 1) number of affiliated funds, 2) fraction of invested wealth in affiliated funds, 3) value of affiliated funds, or 4) fraction of value in affiliated funds. The *Forced to offering bank* variable takes value 1 for fundholders who are forced to a new bank that offers affiliated funds. The underlying control group are those who are forced from the same bank but to a new bank that does not offer affiliated funds. The year of the bank switch is denoted as year t and all regressions also include dummies D_{t+1}, \dots, D_{t+4} that take value 1 in the respective post-switch period (estimates are not reported), otherwise zero. Control variables (age, gender, etc.) are defined in Table 2. Standard errors are clustered by individuals and corresponding t -statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	(1) No. aff. funds	(2) % aff. funds	(3) Value aff. funds	(4) % value aff. funds
Forced to offering bank	-0.00 (-0.16)	0.47 (0.85)	-715 (-0.43)	0.56 (1.04)
Forced to offering bank $\times D_{t+1}$	0.65* (13.62)	7.92* (12.72)	61,320* (11.19)	7.91* (12.75)
Forced to offering bank $\times D_{t+2}$	0.88* (11.42)	14.40* (12.27)	99,089* (8.60)	13.96* (12.02)
Forced to offering bank $\times D_{t+3}$	1.12* (13.58)	21.54* (14.97)	123,774* (9.91)	21.31* (14.74)
Forced to offering bank $\times D_{t+4}$	1.29* (14.86)	26.42* (16.48)	154,546* (10.35)	26.46* (16.37)
Observations	25,042	25,042	25,042	25,042
R-squared	0.11	0.09	0.105	0.09
Number of indiv.	5,214	5,214	5,214	5,214
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes

Table 7. Chasing Ratings

The table shows estimates from regressions where the dependent variable is Morningstar ratings across fund holders' 1) held portfolios, 2) bought funds, and 3) bought affiliated funds. The regression includes fundholders who are forced to switch to another bank due to takeover, as well as a control group of fund holders who always remain at the same bank (among banks in Table 1) in the 2005-12 sample period. The *ForcedSwitcher* variable takes value 1 for fundholders who are forced to switch and value 0 for non-switchers. The *AfterSwitch* variable takes value 1 in the post-switch period (years $t+1, \dots, t+4$, relative to the takeover year t), otherwise zero (years $t-3, \dots, t$). For the non-switching control group, we define the post-switch period as 2009-12. All regressions control for age, gender, marital status, education, children in household, immigrant status, income, and wealth, all defined as in Table 2. In regression 3, affiliated buys among switchers before they switch are non-defined, so these are replaced by all fund purchases for that time period. Standard errors are clustered by individuals and corresponding t -statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	(1)	(2)	(3)
	Holdings	Bought funds	Bought affiliated funds
Forced Switcher \times AfterSwitch	-0.49* (-49.58)	-0.56* (-27.28)	-0.55* (-23.10)
Constant	2.91* (728.74)	3.54* (320.64)	3.51* (290.06)
Observations	1,676,235	162,172	128,139
R-squared	0.09	0.13	0.16
Number of indiv.	425,282	119,272	95,868
Control variables	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes

Table 8. Performance

The table shows estimates from regressions where the dependent variable is the 1) Sharpe's ratio of the fund portfolio of an investor, 2) fund portfolio fee levels, 3) concentration of the fund portfolio of the investor, and 4) realized minus the hypothetical return the investors would have obtained had they not switched their portfolios. The regression includes fundholders who are forced to switch to another bank due to takeover, as well as a control group of fund holders who always remain at the same bank (among banks in Table 1) in the 2005-12 sample period. The *ForcedSwitcher* variable takes value 1 for fundholders who are forced to switch and value 0 for non-switchers. The *AfterSwitch* variable takes value 1 in the post-switch period (years $t+1, \dots, t+4$, relative to the takeover year t), otherwise zero (years $t-3, \dots, t$). For the non-switching control group, we define the post-switch period as 2009-12. All regressions control for age, gender, marital status, education, children in household, immigrant status, income, and wealth, all defined as in Table 2. Standard errors are clustered by individuals and corresponding t -statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	(1)	(2)	(3)	(4)
	Sharpe's ratio	Fees	Concentration	Real – hypoth. return
Forced Switcher \times AfterSwitch	0.04* (5.21)	-0.07* (-20.97)	0.03* (11.44)	0.26* (6.93)
Constant	2.02* (368.68)	0.88* (375.60)	0.67* (318.14)	0.02 (2.08)
Observations	1,852,456	1,858,775	1,917,724	2,071,550
R-squared	0.48	0.13	0.05	0.02
Number of indiv.	439,159	440,008	445,348	416,794
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes

Table 9. Further Results: All Bank Switches

The table shows the magnitude of affiliated mutual fund holdings in terms of the i) number of individuals, ii) number of mutual fund holdings. This statistic is summarized for individuals who own at least one mutual fund (both before and after) and join/leave affiliated mutual funds (cf. Table 1). Simply to conserve space we do not report years $t-6$, $t-4$, $t-2$, $t+3$ and $t+5$ in the table summarized in Figure 7. Statistical significance of the difference is reported at the 1% level (star-marked*). The statistical test for individuals cannot be tested since there is no underlying distribution.

Panel A: Joining

	Relative to bank switch year t						
	$t-7$	$t-5$	$t-3$	$t-1$	t	$t+1$	$t+3$
<i>Number of individuals</i>							
Holding mutual funds	4,644	15,238	35,868	45,850	44,462	39,404	33,811
Fraction of indiv. with funds with new bank	13.6%	15.1%	12.7%	17.3%	33.1%	42.4%	50.1%
<i>Number of holdings (conditional on holding any)</i>							
Total	2.59	2.89	2.87	3.08	3.40	3.58	3.81
Fraction of funds affiliated with new bank	9.8%	10.8%	9.3%	13.0%	26.0%	33.2%	38.1%
Avg. fraction aff. to neither old nor new bank	1.8%	1.9%	2.1%	2.1%	2.1%	2.1%	2.1%
<i>Value of holdings (conditional on holding any)</i>							
Total	341,893	377,995	355,034	347,926	356,193	364,411	365,111
Fraction of value affiliat. to new bank	9.4%	10.4%	9.1%	12.7%	25.9%	33.5%	38.1%
Avg. fraction aff. to neither old nor new bank	1.7%	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%

Panel B: Leaving

	Relative to bank switch year t						
	$t-7$	$t-5$	$t-3$	$t-1$	t	$t+1$	$t+3$
<i>Number of individuals</i>							
Holding mutual funds	5,296	14,481	24,653	36,155	33,280	27,857	23,811
Fraction of indiv. with funds with old bank	68.1%	71.4%	70.1%	66.2%	53.1%	46.0%	42.1%
<i>Number of holdings (conditional on holding any)</i>							
Total	2.70	3.02	2.99	3.03	3.25	3.34	3.41
Fraction of funds affiliated with old bank	58.3%	62.8%	61.6%	57.8%	44.5%	37.3%	33.1%
Avg. fraction aff. to neither old nor new bank	1.2%	1.3%	1.4%	1.5%	1.6%	1.6%	1.6%
<i>Value of holdings (conditional on holding any)</i>							
Total	317,214	359,877	324,814	327,713	349,755	331,597	316,111
Fraction of value affiliated to old bank	56.0%	61.5%	60.3%	56.6%	43.7%	36.5%	33.1%
Avg. fraction aff. to neither old nor new bank	1.1%	1.3%	1.4%	1.4%	1.6%	1.6%	1.6%

Appendix.

Table A. Bank Acquisitions

The table summarizes the acquired banks and acquiring banks, the years in which the takeovers occur (year t), and the pre- and post-merger years available in our 2005-12 sample period. The table further shows the number of people exposed to a merger in year t . We track individuals exposed to takeover both forward in time when they are customers of the new bank (from $t+1$ to $t+4$, where the number of observations drop due to death/emigration/individuals voluntarily switching banks/data ending in 2012) and back in time when they are customers of the old bank (from $t-1$ to $t-4$, where the number of observations gradually drop due to individuals being less than 18 years old, not having immigrated yet, not yet having joined the soon-to-be-acquired bank and data sample starting in 2005). We further drop person-year observations in the pre-merger period where a person is customer in the acquiring bank (e.g. consider a person at Bank A in 2005-06, then at Bank B in 2007, and finally forced back to Bank A in 2008-12. In this case we drop years 2005-06 from the treatment sample). We suppress the total number of individuals affected at $t-6$, $t-5$ and $t-4$ due to Denmark Statistic's confidentiality restrictions requiring any reported number to contain least three underlying institutions.

	Date	Acquirer	Acquired bank	$t-6$	$t-5$	$t-4$	$t-3$	$t-2$	$t-1$	t	$t+1$	$t+2$	$t+3$	$t+4$
1	2008, Mar.	Sydbank	Bank Trelleborg				2005	2006	2007	2008	2009	2010	2011	2012
2	2008, Sept.	Nordea Bank	Roskilde Bank				2005	2006	2007	2008	2009	2010	2011	2012
3	2008, Oct.	Nykredit Bank	Forstædernes Bank				2005	2006	2007	2008	2009	2010	2011	2012
4	2008, Oct.	Handelsbanken	Lokalb. Nordsjæl.				2005	2006	2007	2008	2009	2010	2011	2012
5	2009, Nov.	Nordea Bank	Fionia Bank			2005	2006	2007	2008	2009	2010	2011	2012	
6	2011, Sept.	Jyske Bank	Fjordbank Mors	2005	2006	2007	2008	2009	2010	2011	2012			
Total no. of individuals affected:				Suppr.	Suppr.	Suppr.	112,295	116,663	119,346	119,623	109,009	90,034	83,796	52,096

Case 1:

January 28, 2008, bankTrelleborg A/S notifies Copenhagen Stock Exchange that the Danish Financial Supervisory Authority on January 21, 2008 has approved that the Foundation 'Fonden for bankTrelleborg', as majority owner of bankTrelleborg A/S, forces minority shareholders to redeem their shares.

February 1, 2008, Sydbank notifies Copenhagen Stock Exchange that the Foundation 'Fonden for bankTrelleborg' on February 1, 2008 has forced minority shareholders to redeem their shares and sold the equity capital to Sydbank.

March 27, 2008, Sydbank notifies Copenhagen Stock Exchange that the Board of Directors in Sydbank and bankTrelleborg have approved the merger between the two banks with Sydbank as the continuing company.

Case 2:

Roskilde Bank A/S is acquired by three different banks.

September 29, 2008, the 'Bankaktieselskabet af 24. august 2008' (i.e. an interim Financial Resolution Authority that was created to take over the original Roskilde Bank) notifies Copenhagen Stock Exchange that, as of September 28,

- (i) Nordea buys the branches Algade (Team A+C), Ringsted, Greve, Køge, Solrød, Taastrup, Osted, Kirke Hyllinge and Hyrdehøj. This sale is the one we study in the paper, as Nordea Bank is directly associated with Nordea Invest.

- (ii) Spar Nord Bank buys the branches Holbæk, Helsingør, Hvalsø, Køgevej, Jyllinge, Svogerslev and Himmelev.
- (iii) Arbejdernes Landsbank buys the branches København, Kalundborg, Lyngby, Frederikssund and Ro's Torv.

Case 3:

September 15, 2008, Forstædernes Bank A/S notifies Copenhagen Stock Exchange that Nykredit has made an offer to purchase all shares in Forstædernes Bank A/S.

October 21, 2008, notification to Copenhagen Stock Exchange that Nykredit Realkredit A/S owns 98.1% of outstanding shares in Forstædernes Bank A/S.

October 21, 2008, notification to Copenhagen Stock Exchange that Nykredit Realkredit A/S has decided to force all remaining shareholders in Forstædernes Bank A/S to redeem their shares. They have four weeks to do so. On this background, Forstædernes Bank is delisted from the Copenhagen Stock Exchange, with last day of trading October 31, 2008.

Case 4:

September 15, 2008, Lokalkbanken i Nordsjælland notifies Copenhagen Stock Exchange that Handelsbanken has made an offer to purchase all shares in Lokalkbanken.

October 15, 2008, notification to Copenhagen Stock Exchange that Handelsbanken owns 97.7% of outstanding shares.

October 22, 2008, notification from Copenhagen Stock Exchange that Lokalkbanken is delisted from the exchange, with last day of listing being October 28, 2008, after which the remaining minority shareholders are forced to redeem their shares.

Case 5:

August 31, 2009, 'Finansiel Stabilitet', the Danish Financial Resolution Authority, sends out a press release that an agreement has been made with Nordea regarding a sale of Fionia Bank, except particularly risky corporate exposures, subject to approval by the Danish FSA and competition authorities. The same day, Nordea sends out a press release that Nordea acquires 29 Fionia Bank branches with 400 employees, 75,000 retail customers, and 9,500 corporate customers.

November 25, 2009, Finansiel Stabilitet sends out a press release that the competition authorities have approved the sale, and the sale is expected to be effective as of November 30, 2009.

Notice that Fionia Bank established a mutual fund (Fionia Invest) in 2007. The fund was bought by Nordea in 2010. Fund holders observing a name shift of their funds in 2010 for this reason are not treated as selling Fionia Invest and buying Nordea Invest, as this is an automatic name shift.

Case 6:

Fjordbank Mors is sold by 'Finansiel Stabilitet' to four different banks.

June 26, 2011, the branch in Århus is sold to Sparekassen Kronjylland.

July 8, 2011, the branches in Struer and Thisted are sold to Sparekassen Thy.

July 18, 2011, the branches in Durup, Roslev, Glyngøre and Fur are sold to Sparbank.

September 30, 2011, the activities of Fjordbank Mors on the island of Mors are sold to Jyske Bank (47,000 customers). This sale is the one we study in the paper, as Jyske Bank is directly associated with Jyske Invest.

Table B. Affiliated Holdings

The table shows the annual i) number of individuals, ii) number of mutual funds held and iii) value of mutual fund holdings for depositors in the six banks listed in Table 1. In Panels A and B the proportion held in affiliated mutual funds need not correspond to the fraction of the two corresponding numbers reported in the table (e.g. $1.96 / 2.92 \neq 60.9\%$), since the table reports the average proportion from first calculating the proportion for each individual fundholder and then taking an average thereof. Statistical significance of the difference is reported (star-marked*) at the 1% level. The statistical difference in the number of individuals cannot be tested since there is no underlying distribution.

	Calendar year								Stat. diff. 2005 vs. 2012
	2005	2006	2007	2008	2009	2010	2011	2012	
Panel A. Number of individuals									
Holding mutual funds	357,925	390,041	368,648	350,785	343,294	342,639	335,399	326,857	
Holding affiliated mutual funds	256,291	288,032	298,367	274,372	263,599	267,165	262,449	256,610	
Fraction of affiliated holding	71.6%	73.8%	80.9%	78.2%	76.8%	78.0%	78.2%	78.5%	
Panel B. Number of holdings (conditional on holding any)									
Total	2.92	3.46	3.17	3.22	3.27	3.50	3.52	3.67	0.76*
Affiliated mutual funds	1.96	2.29	2.40	2.36	2.32	2.50	2.49	2.56	0.60*
Fraction of affiliated mutual funds	60.9%	61.9%	73.1%	70.8%	68.4%	69.0%	69.1%	68.8%	7.9%*
Panel C. Value of holdings (conditional on holding any)									
Total	411,820	628,723	388,708	300,186	345,849	396,219	386,806	436,139	24,319*
Value of affiliated mutual funds	245,270	378,337	281,362	213,753	234,031	274,184	270,107	309,587	64,317*
Fraction of affiliated value	57.6%	59.2%	72.1%	69.5%	66.8%	67.9%	68.1%	68.7%	11.0%*

Probit regressions reported in Table C

Figure 2 in the paper presents unconditional averages across individuals. The decision to purchase certain mutual funds might depend on investor characteristics and macroeconomic trends. We are interested in evaluating whether investors decide to buy certain funds because they are funds affiliated with the main bank of the customer. To evaluate the strength of the bank-connection channel, and at the same time control for investor characteristics and year-fixed effects (to account for macroeconomic trends affecting all investors), we estimate panel probit regressions where the outcome variable is a dummy equal to one if the investor owns an affiliated mutual fund (i.e. a fund from a fund family affiliated with the main bank of the customer) and zero otherwise. The explanatory variables are dummies for the bank relation of the customer and other controls. The six regressions take the form:

$$\begin{aligned}
 P(I_{MutualFundFamilyA,it} | X) &= a + \sum_{j=A}^F \beta_1 Bank_{j,it} + Controls + \varepsilon_{A,it} \\
 P(I_{MutualFundFamilyB,it} | X) &= a + \sum_{j=A}^F \beta_1 Bank_{j,it} + Controls + \varepsilon_{B,it} \\
 &\vdots \\
 P(I_{MutualFundFamilyF,it} | X) &= a + \sum_{j=A}^F \beta_1 Bank_{j,it} + Controls + \varepsilon_{F,it}
 \end{aligned}$$

$P(I_{MutualFundFamilyA,it})$ takes value 1 if individual i owns a mutual fund affiliated with mutual fund family A at time t , $P(I_{MutualFundFamilyB,it})$ takes value 1 if an individual owns a mutual fund affiliated with mutual fund family B, etc., for all six banks.²⁶ The binary dummy $Bank_{j,it}$ takes value 1 if individual i is a customer in bank j at time t . The other bank dummy variables are defined similarly.

The list of controls includes age of the investor, a gender dummy, and so on, see the text accompanying Table 2. Standard errors are clustered by individuals, and the regressions include time fixed-effects to account for common time trends that affect all individuals. The sample includes all investors holding funds in one of the six fund families mentioned in Table 1.

Table C contains the results from the six probit estimations, one for each bank.²⁷ The coefficient estimates are marginal effects of the explanatory variables, calculated at their means. The main conclusion from Table C is that the effect of being a customer in a bank affiliated with the mutual fund dominates all other controls. There are several ways of illustrating this. First, the marginal effects of the own-bank dummies are way higher than any other marginal effects, and very significant. The marginal effects of the own-bank dummies are highlighted in Table C and range from 0.37 to 0.81. The average is 0.60. This means that the probability of owning mutual funds affiliated with your main bank is 37%-81% higher if you are a customer in the bank that is affiliated with the fund, compared to being a customer in one of the other banks, holding all control variables constant at their means. The average of the other bank dummies is a negative -0.02. The marginal

²⁶ It is important to stress that Bank A is not necessarily Bank 1 (Danske Bank) from Table 1, Bank B not necessarily Bank 2 (Handelsbanken), etc. The reason is that confidentially rules of Statistics Denmark prevent us from publishing results for individual firms in ways such that firms can be identified.

²⁷ Each panel regression includes 737,074 individuals. The total number of individuals included in the regressions is considerably higher than the number for a single year (e.g. 438,278 in 2012, cf. Table 2), as the number of fund holders is not the same every year and fundholders are not the same every year either. The total pool of people holding funds (with available data to be included in the regressions) at any time across eight years is 737,074.

effects of the controls (age, gender, etc.) are tiny compared to the effect of being a customer in the bank affiliated with the mutual fund.

There is a second way of illustrating the strong effect of being customer in a bank affiliated with a fund, inspired by Foerster, Linnainmaa, Melzer & Previtro (2015). They find that fixed-advisor effects increase the explanatory power for investors' portfolio characteristics from 12% to 32%. We can do a similar exercise. We exclude all bank dummies from the regressions, i.e. let the choice of mutual fund family be determined by individual background characteristics and performance only. Such regressions (not shown but available) produce Pseudo R^2 of, respectively, 5%, 1%, 3%, 1%, 18%, and 16%. The average is 7%. This can be compared to the Pseudo R^2 s reported in Table C that range from 31% to 62%. The average is 45%. Including bank-relation dummies thus increase the average explanatory power by a factor of more than six. This effect is large compared to the effect identified by of Foerster et al. (2015).

Table C. Affiliated Holdings: Probit Regressions

The table shows the marginal effects estimated from probit regressions presented in section 5.1, where the dependent variable is an indicator for owning at least one affiliated mutual fund in particular fund families. For example, in equation (1) the dependent variable $P(I_{(MutualFundFamilyA)})$ takes value 1 if an individual owns a mutual fund affiliated with this particular mutual fund, and the binary dummy 'Depositor in bank A' takes value 1 if an individual is a customer in Bank A, etc. The banks and funds are those listed in Table 1. Marginal effects of the explanatory variables on affiliated fund ownership are calculated at their means. Control variables are defined in Table 2. The sample consists of all fund holders (cf. summary statistics in Table 2). Standard errors are clustered by individuals and corresponding z-statistics testing for zero marginal effect are reported in parentheses, i.e. the ratio of the marginal effect estimate to the standard errors of the respective predictor. Star-marked coefficients are statistically significant at the 1% level.

	(1) Holdings in fund family A	(2) Holdings in fund family B	(3) Holdings in fund family C	(4) Holdings in fund family D	(5) Holdings in fund family E	(6) Holdings in fund family F
Depositor in bank A	0.65* (575.07)	-0.03* (-26.34)	-0.02* (-23.79)	-0.04* (-69.29)	-0.00* (-13.20)	-0.00* (-7.15)
Depositor in bank B	-0.16* (-97.53)	0.59* (367.06)	-0.01* (-15.96)	-0.03* (-56.03)	-0.00* (-6.26)	-0.00* (-11.77)
Depositor in bank C	-0.17* (-72.18)	-0.01* (-5.43)	0.79* (385.61)	-0.04* (-57.12)	-0.00* (-2.81)	-0.00* (-9.38)
Depositor in bank D	-0.17* (-73.10)	-0.06* (-33.96)	-0.03* (-27.72)	0.73* (305.34)	-0.00* (-7.71)	-0.01* (-11.85)
Depositor in bank E	-0.13* (-24.65)	0.01 (1.18)	0.01* (3.64)	-0.02* (-9.92)	0.47* (63.48)	-0.00* (-4.28)
Depositor in bank F	0.16* (38.00)	0.03* (10.19)	0.04* (20.11)	0.05* (25.33)	-0.00 (-1.61)	0.46* (103.15)
Age	0.00* (16.49)	-0.00* (-13.58)	-0.00* (-12.50)	-0.00* (-18.63)	-0.00* (-2.93)	0.00 (1.40)
Female	0.02* (11.95)	-0.02* (-19.55)	-0.01* (-11.24)	-0.01* (-17.02)	-0.00 (-2.19)	-0.00* (-2.64)
Married	-0.03* (-20.19)	0.02* (17.90)	0.00* (6.36)	0.01* (20.11)	-0.00 (-1.72)	0.01* (23.18)
Higher educ.	0.06* (24.63)	0.03* (19.22)	0.02* (20.97)	0.02* (17.31)	-0.00 (-1.40)	-0.00 (-0.56)
Children	-0.01* (-5.98)	-0.00* (-4.06)	0.00* (2.76)	-0.00 (-1.12)	-0.00 (-1.80)	0.00* (3.97)
Immigrant	0.05* (5.79)	0.01* (2.59)	0.01* (3.21)	0.01* (2.73)	0.00 (0.06)	0.00 (2.37)
Income/100,000	-0.00 (-0.35)	0.00* (12.88)	0.00* (5.44)	0.00* (15.87)	-0.00 (-1.90)	0.00* (4.45)
Wealth/100,000	0.00* (19.72)	0.00* (30.91)	0.00* (30.11)	0.00* (39.37)	0.00* (8.00)	0.00* (21.84)
Observations	3,897,341	3,897,341	3,897,341	3,897,341	3,897,341	3,897,341
Pseudo R2	0.41	0.40	0.43	0.38	0.56	0.27
Number of individuals	737,074	737,074	737,074	737,074	737,074	737,074
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table D. Exogenous Bank Switches: Regressions including Bank-by-Year Fixed Effects

The table shows estimates from regressions where the dependent variable is 1) number of affiliated funds, 2) fraction of funds in affiliated funds, 3) value of affiliated funds, or 4) fraction of value in affiliated funds. The *ForcedSwitcher* variable takes value 1 for fundholders who are forced to a new bank that offers affiliated funds, where the underlying control group are those who always remain at the same bank (among banks in Table 1) in the 2005-12 sample period. The year of the bank switch is denoted as year t and all regressions also include dummies D_{t+1}, \dots, D_{t+4} that take value 1 in the respective post-switch period (estimates are not reported), otherwise zero. The estimates of the interaction of *ForcedSwitcher* and these four post-switch dummies is reported in the table, thereby showing the year-by-year cumulative effect on holdings of affiliated funds. For the non-switching control group, we define the post-switch period as 2009-12. All regressions control for age, gender, marital status, education, children in household, immigrant status, income, and wealth (estimates are not reported), all defined as in Table 2, and year, bank, and bank-by-year fixed effects. Standard errors are clustered by individuals and corresponding t -statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	(1) No. aff. funds	(2) % aff. funds	(3) Value aff. funds	(4) % value aff. funds
Forced Switcher	-1.67* (-143.47)	-58.73* (-170.55)	-181,221* (-46.53)	-58.06* (-164.45)
Forced Switcher $\times D_{t+1}$	0.32* (22.59)	9.89* (32.33)	46,848* (12.57)	11.32* (35.42)
Forced Switcher $\times D_{t+2}$	0.78* (37.64)	21.23* (47.25)	79,446* (16.43)	23.33* (49.84)
Forced Switcher $\times D_{t+3}$	0.84* (34.71)	25.59* (49.91)	98,114* (18.55)	27.13* (51.06)
Forced Switcher $\times D_{t+4}$	1.09* (38.43)	30.33* (50.42)	108,734* (16.74)	30.89* (49.57)
Observations	2,528,774	2,528,774	2,528,774	2,528,774
R-squared	0.08	0.19	0.173	0.22
Number of indiv.	471,230	471,230	471,230	471,230
Control variables	Yes	Yes	Yes	Yes
Bank-by-year fixed effect	Yes	Yes	Yes	Yes

Table E. Probability of Having Affiliated Funds after Bank-switch. Treated individuals only

The table shows the marginal effects estimated from probit regressions, where the dependent variable is equal to 1 if the investor holds at least 80% of her fund portfolio in affiliated funds, and zero if affiliated holdings are less than 20%. The sample is restricted to those owning funds to begin with and then being forced to switch to a bank offering affiliated funds. Marginal effects of the explanatory variables are calculated at their means. Control variables are defined in Table 2. Standard errors are clustered by individuals and corresponding z-statistics testing for zero marginal effect are reported in parentheses, i.e. the ratio of the marginal effect estimate to the standard errors of the respective predictor. Star-marked coefficients are statistically significant at the 1% level.

	Prob. of holding affiliated fund
D _{t+1}	0.10* (9.54)
D _{t+2}	0.21* (12.67)
D _{t+3}	0.30* (13.71)
D _{t+4}	0.39* (13.27)
Age	0.00 (0.71)
Female	0.00 (0.75)
Married	0.00 (0.73)
Higher educ.	-0.02* (-4.07)
Children	-0.02* (-3.71)
Immigrant	0.03 (1.08)
Income/100,000	-0.00 (-1.74)
Wealth/100,000	-0.00 (-1.71)
Observations	44,620
Pseudo R2	0.17
Number of clusters	14,282