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

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Abstract

We use bank failures to analyse exogenous variation in the distribution channel of bank-affiliated mutual funds. Our contribution is three-fold. First, we establish a causal effect from the distribution channel of mutual funds to retail investors' fund portfolios. As our main empirical result, we secondly document that the magnitude of flows induced by changes in the distribution channel is large; it drives at least a third of households' mutual fund choices. Third, we show that mutual fund flows are not directed into high-rated funds. We conclude that the distribution channel has a large, causal, and detrimental impact on investors' portfolios.

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 (Christoffersen, Musto, and Wermers, 2014). Understanding what determines fund flows is thus important. Investors' choices of funds are typically traced to their preferences for fund performance (e.g., Berk and Green, 2004). However, mutual funds are often distributed via intermediaries. In the US, via financial advisors/brokers (Bergstresser, Chalmers, and Tufano, 2009; Del Guercio and Reuter, 2014). In Europe, via banks (Ferreira, Matos, and Pires, 2018).

Recent literature has shown that the distribution channel of financial intermediaries influences retail investors' choice of mutual funds.[1] But how much? This paper uses a unique setting that allows us to identify the importance of the distribution channel for households' choices of mutual funds. Using bank failures and detailed individual-investor data, we make three contributions. First, we show that exogenous shifts in the distribution channel of mutual funds exert a causal influence on retail investors' choice of mutual fund. Second, we find that shifts in the distribution channel of mutual funds induce large mutual fund flows; our results suggest that the distribution channel drives at least a third of households' mutual fund choices. Third, we document that following distributors does not lead investors to buy high-rated mutual funds.

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 one needs knowledge of the detailed composition of investors' mutual fund portfolios. As an example, analysing data from one or several brokers will not do the job as such data

[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), Sun (2017), Coockson, Jenkinson, Jones, and Martinez (2018), and Linnainmaa, Melzer, and Previtero (2018).

do not provide the full picture of the total mutual fund holdings of investors, but only those offered by the particular brokers. Instead, one could use survey data, but these are noisy and typically limited to relatively small subsets of the population.

To overcome these challenges, we study a comprehensive register-based data 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 detailed and complete fund portfolios of each investor, we can calculate the fractions of an investor's total holdings of mutual funds that go to the different mutual funds in the investors' portfolios. We also have information on background characteristics of the investors (age, gender, income, wealth, etc.), so that we can control for confounding effects.

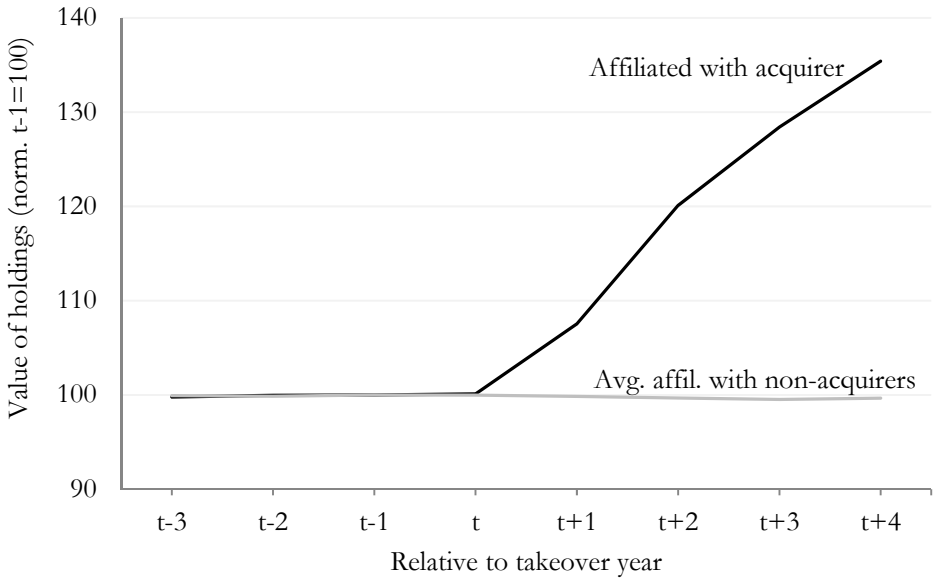
To tackle the question of causality from distribution channel to fund choice, we study exogenous shocks to the distribution channel of mutual funds. In Denmark, like is typical in Europe, banks are the primary sellers of mutual funds, i.e. the distribution channel.[2] Large banks have their own affiliated mutual fund. Smaller banks typically share and promote one or several mutual fund families. 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 automatically switches to a new 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 customers' new bank get an opportunity to directly distribute their funds to the new customers. 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

[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. The same goes for Denmark. We introduce the structure of the mutual fund sector in Denmark in Section 2, explaining how banks have pecuniary incentives to distribute funds from affiliated mutual fund families. We discuss later in this Introduction how our results relate to markets where banks are not the primary distribution channel, like the US.

mutual funds in our setting. Customers can decide to keep existing funds, also after shifting bank, as funds connected to the old bank continue operating normally.

We investigate whether customers forced to switch bank, i.e. customers experiencing a shift in the distribution channel of mutual funds, start increasing their holdings of mutual funds affiliated with their new bank, after they switch bank. 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 1.

Figure 1. Affiliated Holdings over Time[3]



Before the merger between the failing and the acquiring bank (before year *t* in Figure 1), a customer typically does not hold funds affiliated with his/her new bank. There is also no tendency that customers get increasingly interested in funds affiliated with their future acquiring bank, before the shift in distribution channel. After the shift in distribution channel, large portfolio shifts occur. Immediately following the merger, new customers in

[3] We normalize to 100 at *t-1*, because bank shift occur during year *t*, implying that investors shift bank during year *t*. Section 6 provides more details.

acquiring banks start increasing their holdings of mutual funds affiliated with their new bank. 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. The fund affiliated with the new bank of the customer is clearly able to use the establishment of a distribution channel to attract new customers. We document that these results are highly significant in difference-in-difference regressions. In terms of investor wealth, customers have moved 22% of their entire net liquid assets into affiliated funds four years after the switch. In light of the well-known finding that households generally display considerable inertia when making investment decisions (Madrian and Shea, 2001; Bilias, Georgarakos, and Haliassos, 2010; and Calvet, Campbell, and Sodini, 2009a), this is arguably a large effect.

We find that the patterns illustrated in Figure 1 for the average investor arise because more and more people move their entire mutual fund holdings to funds affiliated with their new bank, and not because all investors move a small part of their holdings year by year. The fact that investors switch their entire portfolio, when they switch, obviously also means that investors sell their existing holdings of mutual funds to buy funds affiliated with their new bank.

Mutual-fund ratings, such as Morningstar, are important drivers of mutual fund flows, see Del Guercio & Tkac (2008) and Khorana & Servaes (2012). An alternative explanation for our findings could be that customers are attracted by high-rated mutual funds affiliated with customers' new bank. We verify that investors not experiencing a shift in the distribution channel (our control group) have a clear tendency to buy high-rated funds, when they buy new funds, like in the US (Del Guercio & Tkac, 2008; Khorana & Servaes, 2012). We also verify that investors who experience a shift in the distribution channel buy high-rated funds before the shift. However, after being forced to shift bank and consciously updating their fund portfolios, investors end up with funds that are lower rated than the funds they held before shifting bank. I.e., the new funds investors buy after experiencing a shift in the distribution channel are lower rated than the funds investors held before shifting bank.

Also, the funds that investors buy after shifting bank are generally lower rated than those otherwise comparable investors (the control group) buy. Simply stated, before the shift in distribution channel, investors buy high-rated funds. After, they do not. New distributors are able to convince investors to buy lower-rated funds than they would otherwise buy. The conclusion is that the effect of a change in the distribution channel is so powerful that it eliminates the otherwise strong tendency investors have to buy high-rated mutual funds.

It is possible that, as a consequence of the failure of their bank, customers lose trust in recommendations given by their old now-failed bank. To investigate whether this might be an alternative explanation of our findings, 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 bank. Most of these voluntary switches are probably not exogeneous (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 frequences and consequences of bank shifts in general. In the total sample of investors, we find that purchases of mutual funds affiliated with customers' new banks are at least as large as flows for investors forced to switch bank because their old bank failed. This implies that our results for forced bank shifts are generalizable to the broader setting. It is also means that our results for forced bank shifts are not likely to be driven by a loss of trust, since this would imply a significantly larger effect for forced switches than for customers voluntarily switching between generally healthy banks. We find that on the macrolevel, the distribution channel accounts for at least a third of mutual fund investors' choices of mutual fund.

The exogeneous variation in the distribution channel of mutual funds, that one needs to identify its importance, is clearer in markets where bank-affiliated funds dominate. The reason is that 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, the distribution of mutual funds is often done 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 individual investors. This implies that it is difficult to evaluate the economic importance of the distribution channel using US data. Analyses of US data reveal, however, that the distribution channel statistically influences flows (Bergstresser, Chalmers, and Tufano, 2009; Christoffersen, Evans, and Musto, 2013; Del Guercio, Reuter, and Tkac, 2010; Del Guercio and Reuter, 2014; Gennaioli, Schleifer, and Vishny, 2015; Pool, Sialm, and Stefanescu, 2016; Sun, 2017). When the distribution channel influences flows in the US, our quantification of its economic importance has clear implications for this literature.[4]

Our findings also 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 and invest accordingly. 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 unrelated to the historical performance of funds bought. Models of fund flows that incorporate the role of the distribution channel should therefore be developed (see Roussanov, Ruan, and Wei, 2018, for one example).

Finally, our paper is related to the literature on financial advice. Numerous studies find that advisor incentives influence advice and that investors perform worse 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, 2018; Foerster,

[4] The existing literature on the distribution channel of mutual funds does not quantify its effect on funds choices (probably due to empirical challenges), but i) evaluates the costs and benefits (for customers) in using the distribution channel (Bergstresser, Chalmers, and Tufano, 2009; Christoffersen, Musto, and Wermers, 2014), ii) studies 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) analyzes whether it pays to have a distribution channel (Knuutila, Puttonen and Smythe, 2007; Pool, Sialm, and Stefanescu, 2016).

Linnainmaa, Melzer & Previtero, 2015; Hoechle, Ruenzi, Schaub & Schmid, 2016, 2018; Egan, 2017; Fecht, Hackethal, & Karabulut, 2018). On the other hand, Kramer (2012), Gaudecker (2015), and Linnainmaa, Melzer & Previtero (2018) find that financial advice helps investors and that advice is not biased. We find that investors' tendency to buy high-rated mutual funds is negatively affected by the distribution channel, in the sense that investors experiencing a shift in the distribution channel buy lower-rated funds than they bought before the shift and that otherwise comparable investors buy.

After these introductory remarks, the rest of our paper is organized as follows. The next section provides a brief overview of the mutual fund sector in Denmark. It also briefly describes 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 customers switch bank. Section 7 analyzes whether customers end up with higher-rated funds than they started out with and whether they buy funds that better rated than the average fund. Section 8 studies all bank shifts. A final section concludes.

2. Brief introduction to Danish mutual funds and the financial crisis in Denmark

2.1. Mutual funds in Denmark[5]

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. Regardless of the ownership structure, banks have incentives to promote certain funds, as banks make agreements with funds that secure revenues to the banks from their sale of services to the funds. These

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

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

In most cases, and in particular for large banks, the relationship between a bank and its affiliated mutual fund family is clear. For instance, the mutual fund family of the largest Danish 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, of Sydbank SydInvest, etc. For other banks, particularly smaller banks, the relationship is less clear. 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, there was no one-to-one relationship between these smaller banks and a particular mutual fund.[6] These banks generally did business with fund families that cater to groups of smaller banks. This has three implications for our study. First, these mutual funds were practically unaffected by the bank bankruptcies we study, i.e. customers forced to shift bank could have kept their old funds after shifting bank. Second, when there is no one-to-one relation between smaller banks and mutual funds, banks in trouble could not increase fees from mutual funds to increase revenues.[7] Third, when there is no direct one-to-one relationship between smaller banks and mutual funds, we focus on purchases of funds affiliated with the new (large) bank of customers, when we study customers forced

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

[7] 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.

to shift bank. We have no clear hypothesis about their sales of funds. However, for the full sample of (voluntary, and potential endogenous) bank shifts between large banks, we study both what happens to sales of old funds and purchases of new funds (section 8).

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 from fees and provisions, around 5/20 = 25% of total fees and provisions in Danish banks were from affiliated mutual funds.

2.2. The financial crisis of 2008-09 in Denmark[8]

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

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

by ordinary bank customers, either.[9] 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.

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 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.*[10] This is a

[9] 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.

[10] See: https://www.nemkonto.dk/Servicemenu/Engelsk.

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*.[11]

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.

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 fulfill 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 we study is very high. This is an important fact to remember, as it is not banks as such we study, but customers in banks that 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,

[11] 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.

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.[12] 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 in Denmark.

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 individual firms or individuals cannot be identified. This is why we collect banks 1-3 and 4-6, respectively, in Panel B of Table 1. From public accounts, such as their annual reports, we know, however, that Danske Bank is by far the largest Danish bank and Nordea Bank Denmark the second largest. The combined balance sheets of the six banks in Table 1 cover more than 85% of 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 a customer's choice of mutual fund is influenced by the distribution channel of mutul funds requires two ingredients: (i) identifiable exogeneous variation in the distribution channel and (ii) a possibility to test for changes in the customers' holdings of mutual funds resulting from the change in the distribution channel. We have such a set-up as we can compare mutual flows of investors being forced to experience a shift in the distribution channel (because they are forced to shift bank;

[12] Our data include mutual fund holdings outside retirement accounts. We are interested in studying cases where the investor him-/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).

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.[13] 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. We also list the acquiring bank, which, as mentioned, are the banks in Panel A of Table 1.

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* the 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

[13] The 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.

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.[14] 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 take-overs 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. E.g., they are basically equally old on average, the same fraction have 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 two 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. The fact that mutual fund holders forced to switch bank and other mutual fund holders share the same characteristics is important, as is implies that mutual fund holders forced to switch bank are – overall – no different from other mutual fund holders. They just happened to be customers in banks that ceased existence during the financial crisis.

[14] We show population-wide averages in Table 2. The average mutual fund holder in the six banks listed in Panel A of Table 1 is similar to the average mutual fund holder in Denmark, as the mutual fund holders in the six banks in Panel A account for app. 80% of all mutual fund holders, as mentioned.

5. Static analysis of all fundholders: What is the likelihood of buying 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.[15] This static snapshot indicates the steady-state magnitude of the impact the distribution channel. It 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 adressed in Sections 6 and 7.

5.1. Probit regressions

Figure 2 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

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

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 familiy 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:

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

$P(I_{\text{Mutual Fund Family A, }it})$ takes value 1 if individual *i* owns a mutual fund affiliated with mutual fund family A at time *t*, $P(I_{\text{Mutual Fund Family B, }it})$ takes value 1 if an individual owns a mutual fund affiliated with mutual fund family B, etc., for all six banks.[16] 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 holdings funds in one of the six fund families mentioned in Table 1.

Table 3 contains the results from the six probit estimations, one for each bank.[17] The coefficient estimates are marginal effects of the explanatory variables, calculated at their means. The main conclusion from Table 3 is that the effect of being a customer in a bank

[16] 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.

[17] 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.

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 3 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 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 & Previtero (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^2s reported in Table 3 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).

The conclusion from Figure 2 and Table 3 is that there is a strong tendency for bank customers to buy funds from the mutual fund family affiliated with customers' main bank. In the next section, we investigate whether the banking-customer effect is causal by examining exogenous variation in bank-customer relationships and what this entails for customers' choice of mutual funds.

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 4 shows what happens to investors' holdings of funds from mutual fund families affiliated with customers' new bank before and after customers are forced to switch banks. The switch is forced because the bank – where individuals were customers prior to the merger – is bought by another bank. We compare 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%. To be clear, 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), 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 an astonishing 50.5% after 4 year. 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.[18] Similarly, the investor starts holding an increasing number of funds affiliated with the

[18] 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 4 and one at t+4 (Nordea/Fionia), explaining the reduction.

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 from 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. No such trend is observed in the average fraction of fund value invested in funds affiliated with non-acquiring banks. These results, i.e. value of holdings in funds affiliated with the acquring vs. non-acquiring banks, are what we illustrate in Figure 1 in the Introduction to this paper. This implies that the distribution channel drives at least a third of the individuals' portfolios into new mutual fund holdings.

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 the new bank.[19] From Table 1 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 4 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

[19] 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 452,841·36.7% = DKK 166,000, as the DKK 452,841 and 36.7% reported in Panel A of Table 6 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.

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 more next year, etc.? Or, is it so that some investors in one year change their portfolio completely, next year other investors change their portfolio completely, etc.? Figure 3 provides a surprisingly clear answer. It is the second effect that explains our findings. In more detail, 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. 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 4 and Figure 1 for the average investor 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. One likely explanation for these effects is that investors exhibit inertia, i.e. trade seldomly, but when they do, they move their full portfolio.

We note that Figure 3 implies that people are selling their existing mutual funds after switching, simply because otherwise a customer cannot end up having 100% of her mutual fund portfolio in funds connected with her new bank.

6.2.1. 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 5.[20] 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,

$$y_{i,j,t} = \alpha + \beta ForcedSwitcher_{i,j} + \sum_{k=1}^{4} \gamma_k D_{i,j,t+k} + \sum_{k=1}^{4} \delta_k ForcedSwitcher_{i,j} \cdot D_{i,j,t+k}$$

$$+ Controls_{i,j,t} + \varepsilon_{i,j,t}$$

where $y_{i,j,t}$ is outcome variable for individual i in bank j at time t, $ForcedSwitcher_{i,j}$ 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 $Controls_{i,j,t}$ collects control variables and year fixed effects. In Table 5, we report the key estimates of interest: β and δ_1, δ_2, δ_3, and δ_4.

Consider first the estimates of β presented in the first row of Table 5. 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 (≈ 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 treatment and control have been reduced by 1.06 funds, 28.9%-points,

[20] We assume the post-merger period to be 2009-12 for non-switchers.

DKK 163,215 (≈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 280,000 DKK has been reduced to 120,000 DKK) has been accomplished.

Inderst & Ottaviani (2012a, 2012b) suggest that advisors have incentives to exploit in particular naïve investors via high fees and prices. We test whether individuals with less wealth, as a proxy for less sophisticated investors (Calvet et al., 2007; 2009b), are even more likely to buy funds affiliated with their new bank. We interact our key variable with wealth of the individual, but the interaction term turns out insignificant (not reported). This means that mutual funds investors buy funds from fund families affiliated with their new bank, no matter whether investors have high wealth or low wealth.

We conclude from these analyses that the distribution channel is important for what mutual funds customers buy. The likelihood that you hold funds distributed via your bank is high and dominates any other explanatory variable (Section 5; Figure 2 and Table 3), the distribution channel causally affects fund flows, and the economic impact of the distribution channel is large, as it moves large fractions of customers' mutual fund holdings (this section; Figures 1 and 3 and Tables 4 and 5).

7. Chasing fund ratings

We have documented that the distribution channel is important for fund flows. Could it be that investors are attracted to funds affiliated with their new bank because these funds are better rated? To test this, we follow the idea in Berk & Green (2004). They argue that past performance of mutual funds influence investor flows, as investors extract information about fund managers' skills by observing their past performance. We use the Morningstar rating of a fund as a measure of the historical performance of the fund. 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 understandable. Del Guercio & Tkac (2008) and Khorana & Servaes (2012) show that these ratings are important drives 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. The Morningstar rating ranges 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 calculate for each investor his/her value-weighted rating, using those funds where ratings are available.[21]

We conduct our analysis in two steps. First, we investigate whether investors end up with funds that are better rated than the ones investors held before their switch of bank. Second, we ask whether investors, at the time of purchase, buy funds that have a high rating relative to other available funds.

7.1. 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. 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 4) minus those for which data on ratings are missing.[22] The figure reveals that investors do not on average end up with portfolios containing higher-rated funds than the ones they held before their switch of bank. One can debate whether the drop in average rating of 0.3 is large or small (below we present results from regression analyses that test for significance), but the main point is that, if anything, investors end up with funds that at least have no better historical performance than the funds investors held at the time of switch of bank.

[21] Ratings are not available for new funds, for instance, as they obviously have no historical performance. The funds must have existed for at least three years before Morningstar rates it.

[22] 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).

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

The finding that forced switchers do not end up with better-rated fund portfolios does not necessarily mean that investors are not trying to chase ratings. In other words, even if the bought funds have a lower rating than the ones investors held before their shift of bank (Figure 4), the bought funds may still have a high rating compared to other funds available on the fund menu at the time of purchase.

In Berk & Green (2004), investors observe past performance and buy into funds that have delivered good historical performance relative to other funds. In terms of Morningstar rating, this means that we should see more purchases of funds with high ratings than with low ratings. Taking Berk & Green (2004) to the extreme, one might even argue that investors should only buy the best-performing funds, i.e. five-star funds. Less extreme, we should at least see a tendency to purchase high-rated funds.

Del Guercio & Tkac (2008) and Khorana & Servaes (2012) document a very strong influence of Morningstar ratings on fund flows. Khorana & Servaes (2012), for instance, write (p. 106): "The results are striking. The coefficient on the Morningstar rating is highly significant, both statistically and economically. Changing the family Morningstar rating from its 25th percentile (-0.21) to its 75th percentile (0.30) increases [fund family] market share by 34%". 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) and Khorana & Servaes (2012) 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-started 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) and Khorana & Servaes (2012).

Let us now turn to if and how a shift in 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, 41% of purchases were five-star funds. After the switch, the otherwise strong tendency to buy the best-rated funds vanishes completely. In fact, only ten percent of purchases after the switch are five-star funds. Consequently, there are more purchases of low-performing funds after the switch than before the switch.

There are no distributions around the numbers entering Figure 6, as we relate the total number of purchases of funds to the total number of purchases of funds with a certain rating. Hence, we cannot tests for difference in Figure 6. In Figure 7, we study whether investors, when buying new funds, purchase funds that are superior relative to other available mutual funds, i.e. whether investors buy relatively high-rated funds. Using this figure, we can also test whether bought funds are significantly better rated than other funds. We do as follows. For each year, relative to the year the customer is forced to switch bank, we calculate the average rating of bought funds. There is variation in this statistic, as there is a distribution of ratings of funds, and we plot the 1% confidence band in Figure 7. We are interested in whether investors buy funds with relatively good performance compared to other funds. Hence, we look at the average rating of all available funds at each year of purchase, and Figure 7 additionally shows the 1% confidence interval.

Figure 7 reveals that investors, before the switch, have a clear tendency to buy funds that have good historical performance, compared to the average rating of all funds. The average

rating of bought funds is around four, whereas the average rating of all available funds at the time of purchase is around three. The difference is clearly statistically significant. After the forced switch, the story is very different. First, the average rating of funds bought after the switch is considerably lower than the average rating of funds bought before the switch. Second, the average rating of funds bought after the switch is no different from the average rating of all available funds. Already one year after the switch, there is no statistical difference between the rating of funds bought and the average rating of available funds. In summary, we find that the pre-switch difference between the ratings of bought and available funds is a highly statistically significant 0.87. The post-switch difference is a non-significant -0.02.

These conclusions are 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 6. In the first column, 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, which reveals that investors unconditionally end up with lower-rated funds after the switch. We show in Table 6 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 growp. The average rating of funds held by investors in the control group is 2.91, close to the average rating of three for Morningsstar-rated funds. The average rating of funds held ex post by investors experiencing a shift in the distribution channel is -0.49 rating notches lower compared to the control group. Investors churning their portfolios as a result of a shift in the distribution channel of mutual funds end up with lower-rated funds than otherwise similar investors.

But conditional on investors buying new funds after the switch, do they buy relatively high-rated funds? Columns (2) and (3) contain the answer. 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, when actually buying new 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 the effect of the distribution channel is so strong that it eliminates investors' otherwise strong tendency to buy high-rated funds.

8. All joiners and leavers

We have until now studied a sample of investors forced to switch bank because their old bank failed. 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 expect any relation between the performance of a bank and the performance of its affiliated funds, however, as the funds are separate legal entities. This also means, for instance, that there is no way a bank in Denmark can transfer assets from a mutual fund to its own equity. Nevertheless, the investor might lose trust in the advice he/she received from the old bank, and churn his/her portfolio as a result.[23] If one believes that investors in failed banks only shift mutual funds

[23] 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

because they loose trust in their old bank, we should not see investors in surviving banks shifting funds after shifting bank. Second, these cases provide us with an additional characteristic that we cannot estimate using the sample of forced switchers, which is the ability to study not only what happens to investments in funds affiliated with the new bank, but also what happens to investments in funds affiliated with the old bank. This is not 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.[24]

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. Bank shifts are not rare events.

Table 7 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 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).

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.

[24] 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.

The occurrence of a switch is dated time *t*.[25] 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.[26]

We can compare these flows to flows in general, i.e. to flows for investors not shifting bank. Using the data underlying Table 7, 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 flows following bank shifts are thus considerably higher than flows outside periods following bank shifts. So, bank shifts are not rare, and the flows

[25] 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 7. 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 4.

[26] 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.

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 8.

8.1. Regressions

We also present regressions for the total sample of joiners and leavers where we include dummies for these two groups. We are interested in the dynamic response after leaving or joining, i.e. in the coefficients to the interaction terms between the leaver/joiner dummies and the time dummies picking out periods after a switch. Results are in Table 8.[27]

We find that more joiners hold funds affiliated with their new bank after they join that bank. We also find that they hold a higher fraction of funds in affiliated funds, after the switch. Finally, they also increase the value and fraction invested in the new funds. As an example, after four years, joiners have increased their holdings in the new funds by DKK 155,512, relative to non-switchers. Given that they held DKK 195,614 less than non-switchers in the funds affiliated with their new bank when they joined the new bank, they have reduced this difference to DKK 40,000 (DKK 195,000 – DKK 155,000) in just four years.

Holdings in funds affiliated with switchers' old bank (leavers) behave opposite of holdings in funds affiliated with their new bank (joiners). After leaving their old bank, leavers reduce

[27] As we only have eight annual observations for the control group of non-switchers, the size of the event window in a difference-in-difference analysis is more limited compared the univariate analysis in Table 7, where the event window spans *t–7* to *t+6*. For the non-switching control group, we define the post-switch period as 2009-12, resulting in a four-year post-switch. Our results are robust to different choices of post-periods for non-switchers.

their holdings in the funds affiliated with their old bank. For instance, after four years, leavers hold for DKK 172,548 less in funds affiliated with their own bank, compared to non-switchers. Leavers already had lower holdings (DKK 67,930) in funds affiliated with their old bank before leaving, and this difference then accumulates after leaving. This is interesting, as nothing prevents leavers to hold on to their existing funds. It means that new banks seem to persuade new customers to deliberately sell mutual funds affiliated with their old bank and buy funds affiliated with their new bank.

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 failed 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 signifcantly 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.

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 8 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 Sections 6 and 7 that demonstrate 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 opens up towards these customers. 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. Second, we quantify the magnitude of the importance of the distribution channel. Third, we study how the shift in distribution channel affects investors' otherwise strong tendency to buy high-rated funds.

We find that fund flows following bank shifts are large. In terms of investors' wealth, up to 22% of investors' liquid wealth is shifted within four years after a bank shift. Investors do not shift funds because they want to improve the ratings of the funds they hold. In fact, the otherwise strong tendency to buy high-rated funds is considerably reduced for investors experiencing a shift in the distribution channel of mutual funds. We also find that flows are as large for customers shifting bank in general, i.e. for other reasons than the failure of their bank. We conclude that, in aggregate, at least a third of total mutual fund holdings of households are due to the distribution channel.

Our study deals with retail investors. We find that the distribution channel is more important for fund flows than past performance of mutual funds for a significant part of retail investors' fund choices. It would be interesting to examine whether the same applies to other types of investors. For instance, some institutional investors use external companies to search for fund managers. It is an interesting area for future research to examine the impact of an exogenous shock to the distribution channel (e.g., companies that search the market for fund managers) of institutional investors, and see whether the impact is as large as for retail investors.

References

Bhattacharya, U., A. Hackethal, S. Kaesler, B. Loos, S. Meyer (2012). Is unbiased financial advice to retail investors sufficient? Answers from a large field study. *Review of Financial Studies* 25, 975-1032.

Bechmann, K. L. and J. Rangvid (2006). Danish Mutual Funds: Description, performance, and a European comparison. Chapter 3, pp. 31-62, in *Performance of Mutual Funds*, edited by Greg N. Gregoriou. Palgrave Macmillan.

Bechmann, K. L. and J. Rangvid (2007). Rating mutual funds: Construction and information content of an investor-cost based rating of Danish mutual funds. *Journal of Empirical Finance* 14, 662-693.

Bergstresser, D., J. and J. Poterba (2002). Do after-tax returns affect mutual fund inflows? *Journal of Financial Economics* 63, 381-414.

Bergstresser, D., J. M. R. Chalmers, and P. Tufano (2009). Assessing the costs and benefits of brokers in the mutual fund industry. *Review of Financial Studies* 22, 4129–4156.

Berk, J. B and R. C. Green (2004). Mutual fund flows and performance in rational markets. *Journal of Political Economy* 112, 1269-1295.

Bilias, Y., D. Georgarakos, and M. Haliassos (2010). Portfolio inertia and stock market fluctuations. *Journal of Money, Credit and Banking* 42, 715-742.

Calvet, L. E., J. Y. Campbell, P. Sodini (2007). Down or out: Assessing the welfare costs of household investment mistakes. *Journal of Political Economy* 2007 115, 707-747.

Calvet, L. E., J. Y. Campbell, P. Sodini (2009a). Fight or flight? Portfolio rebalancing by individual investors. *Quarterly Journal of Economics* 124, 301-348.

Calvet, L. E., J. Y. Campbell, P. Sodini (2009b). Measuring the financial sophistication of households. *American Economic Review P&P* 99, 393–98.

Chalmers, J. and J. Reuter (2018). Is conflicted investment advice better than no advice? Forthcoming, *Journal of Financial Economics*.

Christoffersen, S. E. K., R. Evans, and D. K. Musto (2013). What do consumers' fund flows maximize? Evidence from their brokers' incentives. *Journal of Finance* 68, 201–23

Christoffersen, S. E. K., D.K. Musto, and R. Wermers (2014). Investor flows to asset managers: Causes and consequences. *Annual Review of Financial Economics* 6, 289-310.

Cookson, G., T. Jenkinson, H. Jones, and J. V. Martinez (2018). Best buys and own brands: Investment platforms′ recommendations of mutual funds. *Working Paper*.

Del Guercio, D. and J. Reuter (2014). Mutual fund performance and the incentive to generate alpha. *Journal of Finance* 69, 1673-1704.

Del Guercio, D., J. Reuter, and P. A. Tkac (2010). Broker incentives and mutual fund market segmentation. *NBER WP* 16312.

Del Guercio, D. and P.A. Tkac (2002). The determinants of the flow of funds of managed portfolios: Mutual funds versus pension funds. *Journal of Financial and Quantitative Analysis* 37, 523-557.

Del Guercio, D., and P. A. Tkac (2008). Star power: The effect of Morningstar Ratings on mutual fund flow. *Journal of Financial and Quantitative Analysis* 43, 907-936.

Egan, M. (2017*).* Brokers vs. retail investors: Conflicting interests and dominated products. *Manuscript, Harvard Business School.*

Fecht, F., Hackethal, A. & Y. Karabulut (2018). Is proprietary trading detrimental to retail investors? *Journal of Finance, Forthcoming.*

Ferreira, M.A., A. Keswani, A. Miguel, and S. Ramos (2012). The flow-performance relationship around the world. *Journal of Banking and Finance* 36, 1759-1780.

Ferreira, M.A., P. Matos, and P. Pires (2018). Asset management within commercial banking groups: International evidence. *Journal of Finance* 73, 2181-2227

Foerster, S., J. Linnainmaa, B. Melzer, and A. Previtero (2015). Retail financial advice: Does one size fit all? *Journal of Finance*, forthcoming.

Gaudecker, H. M.v. (2015). How does household portfolio diversification vary with financial literacy and financial advice? *Journal of Finance* 70, 489-507.

Gennaioli, N., A. Shleifer, and R. Vishny (2015). Money doctors. *Journal of Finance* 70, 91–114.

Hackethal, A., M. Haliassos, and T. Jappelli (2012). Financial advisors: A case of babysitters? *Journal of Banking and Finance* 36, 509-524.

Hoechle, D., S. Ruenzi, N. Schaub, and M. Schmid (2016). The impact of financial advice on trade performance and behavioral biases. *Review of Finance*, forthcoming.

Hoechle, D., S. Ruenzi, N. Schaub, and M. Schmid (2018). Financial advice and bank profits. *Review of Financial Studies*, forthcoming.

Inderst, R., and M. Ottaviani (2012a). How (not) to pay for advice: A framework for consumer financial protection. *Journal of Financial Economics* 105, 393-411.

Inderst, R., and M. Ottaviani (2012b). Financial advice. *Journal of Economic Literature* 50, 494-512.

Ivkovic, Z. and S. Weisnenner (2009). Individual investor mutual fund flows. *Journal of Financial Economics* 92, 223-237.

Jenkinson, T., H. Jones, and J. V. Martinez (2016). Picking winners? Investment consultants' recommendations of fund managers. *Journal of Finance* 71, 2333-2370.

Karabulut, Y. (2013). Financial advice: An improvement for worse? Working Paper. Available at SSRN: https://ssrn.com/abstract=1710634.

Knuutila, M., V. Puttonen, T. Smythe (2007). The effect of distribution channels on mutual fund flows. *Journal of Financial Services Marketing* 12, 88–96.

Khorana, A. and Henri Servaes (2012). What drives market share in the mutual fund industry? *Review of Finance* 16, 81-113.

Kramer, M. M. (2012). Financial advice and individual investor portfolio performance. *Financial Management* 42, 395-428.

Linnainmaa, J. B. Melzer, and A. Previtero (2018). The misguided beliefs of financial advisors. *Journal of Finance, Forthcoming.*

Madrian, B. and D. Shea (2001). The power of suggestion: Inertia in 401(k) participation and savings behavior. *Quarterly Journal of Economics* 66, 1149-1188.

Morningstar (2013). Omkostningsanalyse af fondsomkostninger igennem årtierne. Begrænsede stordriftsfordele til investorerne.

Mullainathan, S., M. Nöth, and A. Schoar (2012). The market for financial advice: An audit study. NBER Working Paper No. 17929.

Pool, V., C. Sialm, and I. Stefanescu (2016). It pays to set the menu: 401(k) investment options in mutual funds. *Journal of Finance* 71, 1779-1812.

Rangvid, J., A. Grosen, F. Østrup, P. Møgelvang-Hansen, H. Frey Jensen, J. Thomsen, P. Schütze, J. Galbo, C. Ølgaard, M. Kleis Frederiksen, N. Buchhave Poulsen (2013). The financial crisis in Denmark - causes, consequences and lessons. Available at: http://em.dk/publikationer/2013/18-09-13-the-financial-crisis-in-denmark.

Roussanov, N., H. Ruan, and M. Wei (2018). Marketing Mutual Funds. *NBER WP 25056*.

Sialm, C., and M. Tham (2016). Spillover effects in mutual fund companies. *Management Science* 62 1472-1486.

Sirri, E. and P. Tufano (1998). Costly search and mutual fund flows. *Journal of Finance* 53, 1589-1622.

Spiegel, M. and H. Zhang (2013). Mutual fund risk and mutual share-adjusted fund flows. *Journal of Financial Economics* 108, 506-528.

Sun, Yang (2017). Does competition protect retail investors? Role of financial advice. *Working Paper*, Brandeis University.

Figure 2. Affiliated holdings

Figure 2 shows i) number of individuals and ii) 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 ≠ 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).

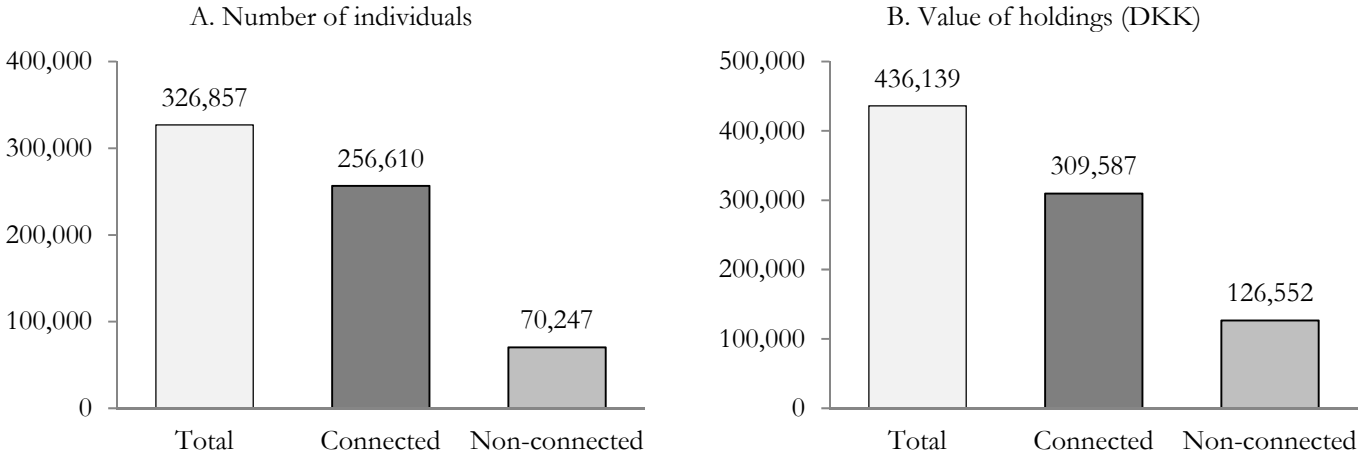


Figure 3. Distribution of Connected Holdings over Time

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 connected 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.

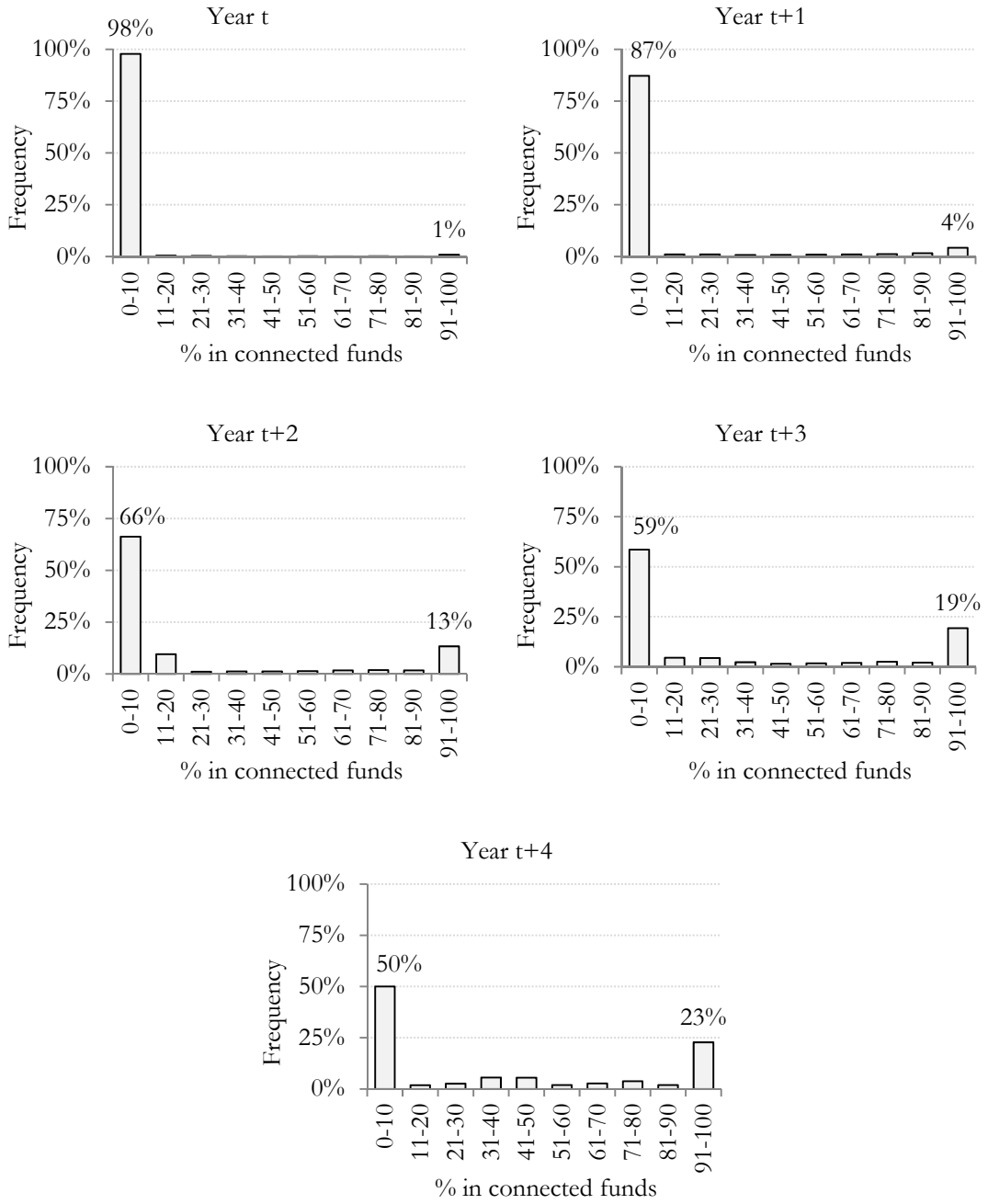


Figure 4. Ratings for Forced Switchers

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, ..., *t*+4, and the pre-switch period is years *t*-3, ..., *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).

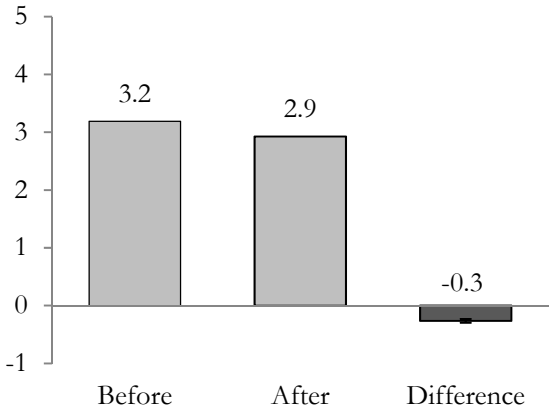


Figure 5. Ratings Choices of Population

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.

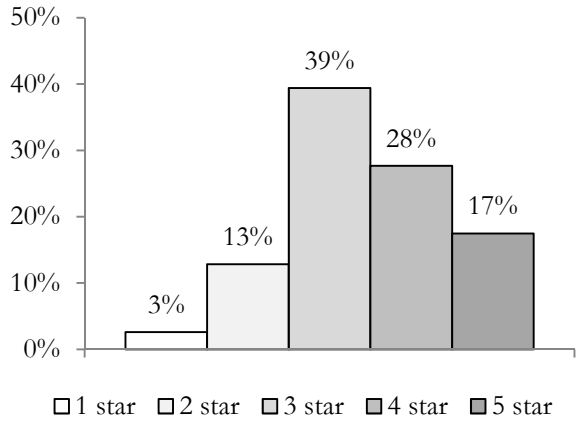


Figure 6. Performance Choice at Time of Trade

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, ..., *t*+4, and the pre-switch period is years *t*-3, ..., *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).

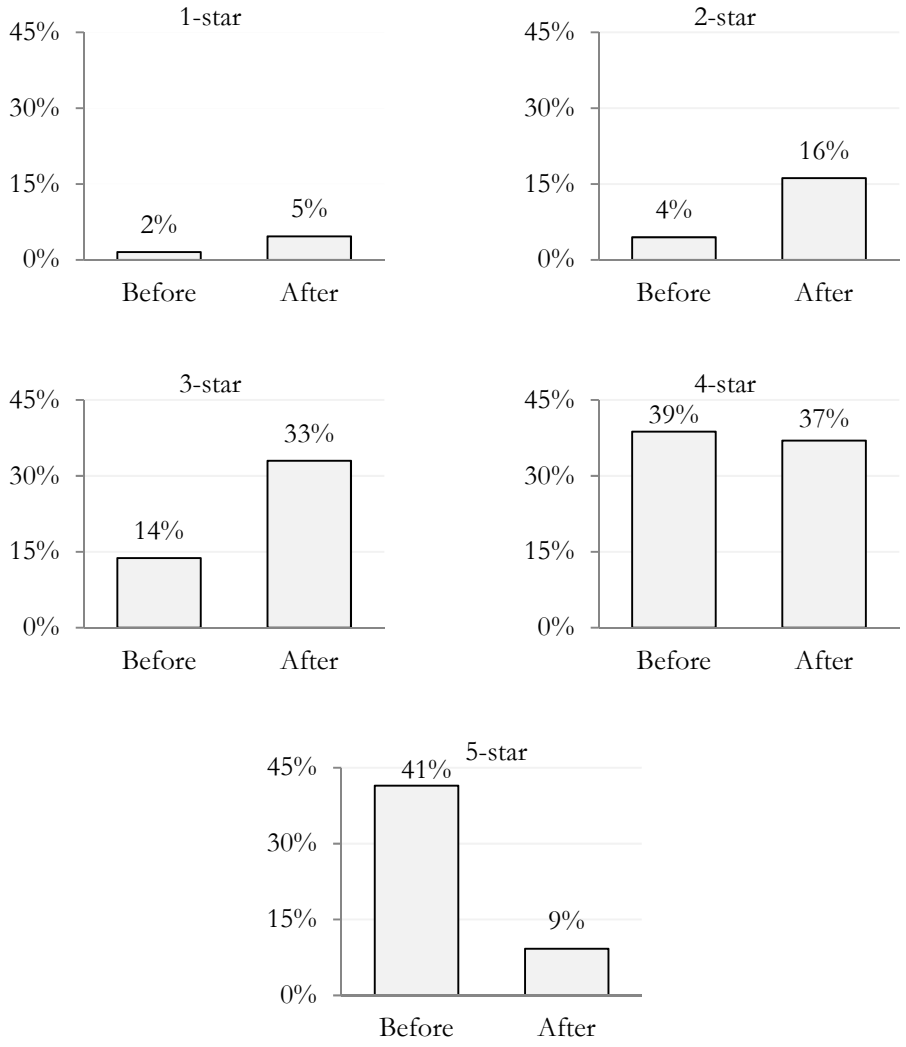


Figure 7. Average Rating of Bought Funds vs. All Funds on the Menu

The figure shows the average Morningstar rating of newly bought funds in each year (using the end-of-year rating prior to purchase). A 1% confidence interval is plotted from the sample of approx. 2,500 portfolios per period that add new funds. The figure also shows the average rating of funds available at the time of purchase, i.e. the average rating on the Danish mutual fund menu (as of end of the previous year). A 1% confidence interval is plotted from the sample of approx. 400 rated mutual funds offered per year.

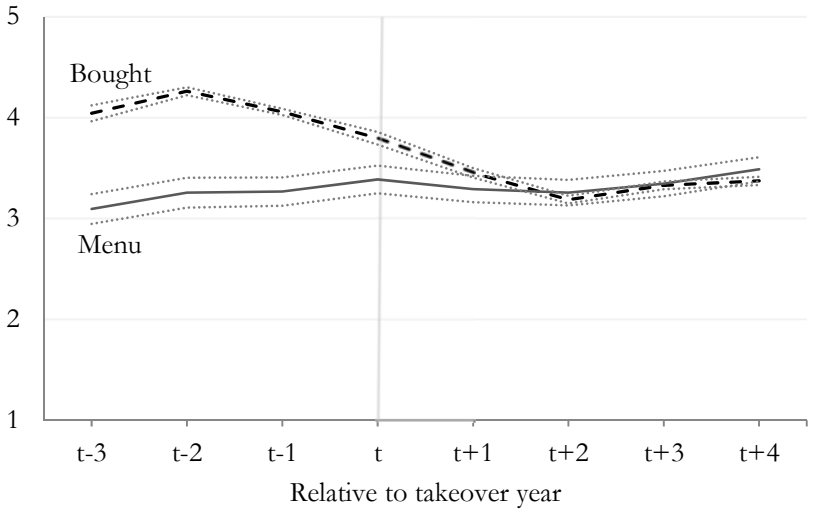


Figure 8. Affiliated Holdings over Time: All Bank Switches

The figure visualizes the key results from Table 7. It shows - seperately for all mutual fund holders either joining or leaving banks - the evolution of the 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.

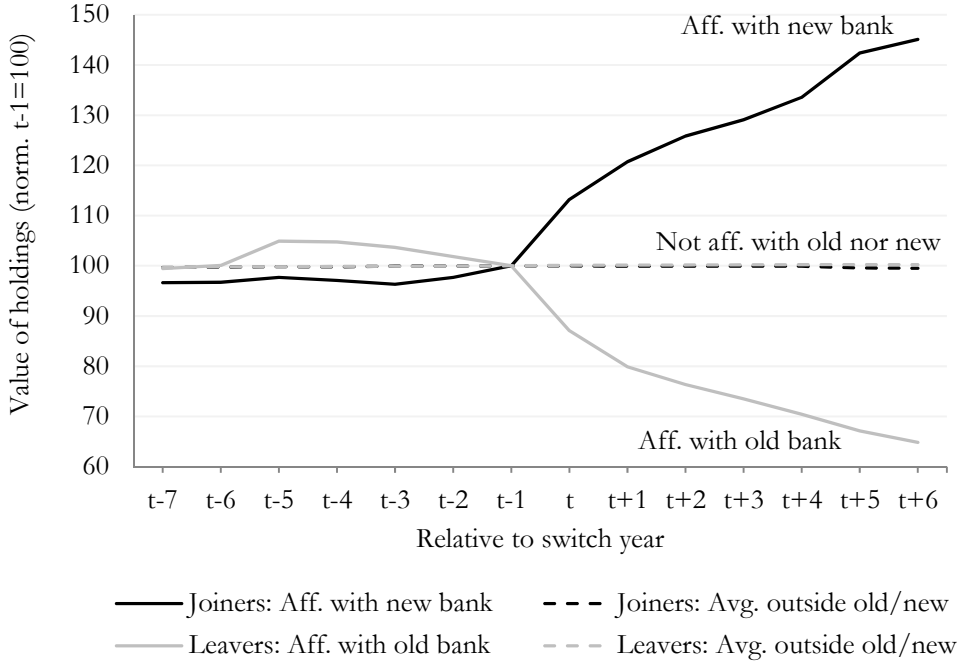


Table 1 . Banks and Mutual Fund Families

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 statistics 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 that are depositors in one of the acquired banks detailed in Table A in the Appendix. 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. honory 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)		Exog. Bank Switchers (N = 12,567)		All fund holders (N = 438,278)		Exog. Bank Switchers (N = 11,114)	
	Mean	St.dev.	Mean	St.dev.	Mean	St.dev.	Mean	St.dev.
Demographics								
Age	57.8	17.7	56.9	17.5	59.6	17.9	61.2	16.3
Female dummy	0.51	0.50	0.50	0.50	0.51	0.50	0.50	0.50
Married dummy	0.51	0.50	0.52	0.50	0.51	0.50	0.53	0.50
Higher educ. dummy	0.10	0.30	0.09	0.28	0.13	0.34	0.12	0.33
Children in househ. dummy	0.19	0.39	0.19	0.39	0.20	0.40	0.18	0.38
Immigration dummy	0.01	0.09	0.00	0.07	0.01	0.09	0.01	0.07
Financials								
Income	327,931	291,974	331,197	297,220	346,113	328,538	342,607	291,882
Net overall wealth	1,543,212	2,999,734	1,648,348	2,892,354	1,641,136	3,300,027	1,633,419	2,960,218
Net house wealth	766,494	1,383,634	786,708	1,437,218	791,582	1,606,236	775,092	1,588,597
Portfolio characteristics								
Value of funds	399,670	723,900	384,806	706,417	404,727	855,963	410,660	789,674
No. of funds	2.74	2.50	2.79	2.79	3.45	3.26	3.66	3.86

Table 3. 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***	-0.03*	-0.02*	-0.04*	-0.00*	-0.00*
	(575.07)	(-26.34)	(-23.79)	(-69.29)	(-13.20)	(-7.15)
Depositor in bank B	-0.16*	**0.59***	-0.01*	-0.03*	-0.00*	-0.00*
	(-97.53)	**(367.06)**	(-15.96)	(-56.03)	(-6.26)	(-11.77)
Depositor in bank C	-0.17*	-0.01*	**0.79***	-0.04*	-0.00*	-0.00*
	(-72.18)	(-5.43)	**(385.61)**	(-57.12)	(-2.81)	(-9.38)
Depositor in bank D	-0.17*	-0.06*	-0.03*	**0.73***	-0.00*	-0.01*
	(-73.10)	(-33.96)	(-27.72)	**(305.34)**	(-7.71)	(-11.85)
Depositor in bank E	-0.13*	0.01	0.01*	-0.02*	**0.47***	-0.00*
	(-24.65)	(1.18)	(3.64)	(-9.92)	**(63.48)**	(-4.28)
Depositor in bank F	0.16*	0.03*	0.04*	0.05*	-0.00	**0.46***
	(38.00)	(10.19)	(20.11)	(25.33)	(-1.61)	**(103.15)**
Age	0.00*	-0.00*	-0.00*	-0.00*	-0.00*	0.00
	(16.49)	(-13.58)	(-12.50)	(-18.63)	(-2.93)	(1.40)
Female	0.02*	-0.02*	-0.01*	-0.01*	-0.00	-0.00*
	(11.95)	(-19.55)	(-11.24)	(-17.02)	(-2.19)	(-2.64)
Married	-0.03*	0.02*	0.00*	0.01*	-0.00	0.01*
	(-20.19)	(17.90)	(6.36)	(20.11)	(-1.72)	(23.18)
Higher educ.	0.06*	0.03*	0.02*	0.02*	-0.00	-0.00
	(24.63)	(19.22)	(20.97)	(17.31)	(-1.40)	(-0.56)
Children	-0.01*	-0.00*	0.00*	-0.00	-0.00	0.00*
	(-5.98)	(-4.06)	(2.76)	(-1.12)	(-1.80)	(3.97)
Immigrant	0.05*	0.01*	0.01*	0.01*	0.00	0.00
	(5.79)	(2.59)	(3.21)	(2.73)	(0.06)	(2.37)
Income/100,000	-0.00	0.00*	0.00*	0.00*	-0.00	0.00*
	(-0.35)	(12.88)	(5.44)	(15.87)	(-1.90)	(4.45)
Wealth/100,000	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
	(19.72)	(30.91)	(30.11)	(39.37)	(8.00)	(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 4. 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
Number of individuals									
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%	
Number of holdings (conditional on holding any)									
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%*
Value of holdings (conditional on holding any)									
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
Number of individuals									
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%	
Number of holdings (conditional on holding any)									
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%*
Value of holdings (conditional on holding any)									
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 5. Exogenous Bank Switches: Regressions

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 (acquirers in Table 5), 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}, ..., 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. 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*	-68.11*	-280,264*	-66.14*
	(-455.88)	(-661.80)	(-139.24)	(-639.87)
Forced Switcher × D_{t+1}	0.14*	2.07*	81,239*	2.02*
	(14.13)	(9.43)	(38.97)	(8.97)
Forced Switcher × D_{t+2}	0.51*	15.14*	107,202*	14.96*
	(31.44)	(40.32)	(33.04)	(38.49)
Forced Switcher × D_{t+3}	0.82*	22.58*	147,675*	22.87*
	(40.14)	(50.71)	(37.62)	(49.73)
Forced Switcher × D_{t+4}	1.06*	28.94*	163,215*	29.56*
	(42.51)	(54.42)	(30.86)	(53.78)
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
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes

Table 6. 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, ..., t+4, relative to the takeover year t), otherwise zero (years t-3, ..., 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, affiiliated 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) Holdings	(2) Bought funds	(3) Bought affiliated funds
Forced Switcher × AfterSwitch	-0.49*	-0.56*	-0.55*
	(-49.58)	(-27.28)	(-23.10)
Constant	2.91*	3.54*	3.51*
	(728.74)	(320.64)	(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 7. Further Results: All Bank Switches

The table shows the magnitude of affiliated mutual fund holdings in terms of i) number of individuals, ii) number of mutuals funds and iii) value of mutual fund holdings. This statistics is summarized for individuals who own at least one mutual fund (both before and after) and join/leave one of the six banks that offer 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, but the complete pattern is summarized in Figure 6. 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: Joining

	Relative to bank switch year *t*									Stat. diff.
	t-7	*t*-5	*t*-3	*t*-1	*t*	*t*+1	*t*+2	*t*+4	*t*+6	*t*-7 vs. *t*+6
Number of individuals										
Holding mutual funds	4,644	15,238	35,868	45,850	44,462	39,404	33,665	20,554	4,519	
Fraction of indiv. with funds with new bank	13.6%	15.1%	12.7%	17.3%	33.1%	42.4%	50.1%	58.2%	69.4%	
Number of holdings (conditional on holding any)										
Total	2.59	2.89	2.87	3.08	3.40	3.58	3.67	3.88	4.07	1.47*
Fraction of funds affiliated with new bank	9.8%	10.8%	9.3%	13.0%	26.0%	33.2%	38.3%	45.6%	56.6%	46.8%*
Avg. fraction aff. to neither old nor new bank	1.8%	1.9%	2.1%	2.1%	2.1%	2.1%	2.0%	2.0%	1.6%	-0.3%
Value of holdings (conditional on holding any)										
Total	341,893	377,995	355,034	347,926	356,193	364,411	365,715	410,521	393,219	51,326*
Fraction of value affiliat. to new bank	9.4%	10.4%	9.1%	12.7%	25.9%	33.5%	38.6%	46.3%	57.8%	48.5%*
Avg. fraction aff. to neither old nor new bank	1.7%	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	1.6%	-0.2%

Panel B: Leaving

	Relative to bank switch year *t*									Stat. diff.
	t-7	*t*-5	*t*-3	*t*-1	*t*	*t*+1	*t*+2	*t*+4	*t*+6	*t*-7 vs. *t*+6
Number of individuals										
Holding mutual funds	5,296	14,481	24,653	36,155	33,280	27,857	23,220	14,593	4,832	
Fraction of indiv. with funds with old bank	68.1%	71.4%	70.1%	66.2%	53.1%	46.0%	42.4%	36.1%	30.8%	
Number of holdings (conditional on holding any)										
Total	2.70	3.02	2.99	3.03	3.25	3.34	3.36	3.47	3.65	0.94*
Fraction of funds affiliated with old bank	58.3%	62.8%	61.6%	57.8%	44.5%	37.3%	33.8%	27.7%	22.0%	-36.3%*
Avg. fraction aff. to neither old nor new bank	1.2%	1.3%	1.4%	1.5%	1.6%	1.6%	1.7%	1.7%	1.7%	0.5%*
Value of holdings (conditional on holding any)										
Total	317,214	359,877	324,814	327,713	349,755	331,597	316,905	343,495	354,819	37,606
Fraction of value affiliated to old bank	56.0%	61.5%	60.3%	56.6%	43.7%	36.5%	33.0%	27.0%	21.4%	-34.6%*
Avg. fraction aff. to neither old nor new bank	1.1%	1.3%	1.4%	1.4%	1.6%	1.6%	1.6%	1.7%	1.7%	0.6%*

Table 8. Further Results: Regressions using All Bank Switches

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. These four regressions are reported for those who own at least one mutual fund (both before and after) and join/leave one of the six banks that offer affiliated mutual funds (cf. Table 1). The *Switcher* dummy variable takes value 1 for fundholders who switch to a new bank that offers affiliated funds (banks 1-6 in Table 1), where the underlying control group are those who always remain at the same bank (banks 1-6 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}, ..., 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 *Treatment* 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. Standard errors are clustered by individuals and corresponding *t*-statistics are reported in parentheses. Star-marked coefficients are statistically significant at the 1% level.

	Joining				Leaving			
	(1) No. aff. funds	(2) % aff. funds	(3) Value aff. funds	(4) % value aff. funds	(5) No. aff. funds	(6) % aff. funds	(7) Value aff. funds	(8) % value aff. funds
Switcher	-1.75*	-53.55*	-195,614*	-51.73*	-0.54*	-12.62*	-67,930*	-11.91*
	(-239.11)	(-359.31)	(-126.72)	(-346.48)	(-49.44)	(-58.01)	(-31.99)	(-54.04)
Switcher × D_{t+1}	0.49*	8.70*	116,461*	8.21*	-0.78*	-21.44*	-49,408*	-21.58*
	(46.07)	(45.44)	(56.31)	(42.31)	(-68.73)	(-80.74)	(-20.25)	(-79.41)
Switcher × D_{t+2}	0.67*	16.17*	116,054*	15.57*	-1.04*	-26.10*	-89,545*	-26.50*
	(51.82)	(70.21)	(44.36)	(65.96)	(-83.57)	(-89.66)	(-35.60)	(-89.56)
Switcher × D_{t+3}	0.94*	22.88*	139,709*	22.50*	-1.25*	-32.40*	-116,525*	-32.77*
	(66.65)	(86.51)	(49.68)	(83.26)	(-88.54)	(-97.20)	(-43.25)	(-97.22)
Switcher × D_{t+4}	1.20*	29.41*	155,512*	29.04*	-1.55*	-38.94*	-172,548*	-40.13*
	(71.43)	(96.63)	(41.25)	(93.47)	(-96.10)	(-100.58)	(-52.26)	(-102.82)
Observations	2,792,057	2,792,057	2,792,057	2,792,057	2,709,358	2,709,358	2,709,358	2,709,358
R-squared	0.06	0.16	0.16	0.15	0.04	0.06	0.15	0.05
Number of indiv.	525,013	525,013	525,013	525,013	509,200	509,200	509,200	509,200
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Appendix.

Table A. Bank Acquisitions

The table summarizes the acquired banks and acquiring banks, the years in which the takovers 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. 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, Lokalbanken i Nordsjælland notifies Copenhagen Stock Exchange that Handelsbanken has made an offer to purchase all shares in Lokalbanken.
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 Lokalbanken 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', a Danish financial authority handling failed banks, 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 sale is expected to be effective as of November 30, 2009.

Case 6:
Fjordbank Mors is acquired by 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 mutuals 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 ≠ 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	2006	2007	2008	2009	2010	2011	2012	2005 vs. 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%*