Outsourcing of Mutual Funds' Non-core Competencies

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This Draft: January 2015

ABSTRACT

I investigate the consequences for mutual funds when they are able to focus more strongly on their core competency portfolio management though their families' decision to outsource funds' non-core activities to external specialists. Specifically, I find that funds of families that outsource shareholder services have about 32 percent lower service fees than funds of families that cater for investors' service needs internally. Consistent with service outsourcing releasing tied resources that can be spent on funds core business, service-outsourced funds outperform their peers by up to 91 basis points. This outperformance increases up to 136 basis points when outsourced funds are compared with inhouse funds that are less capable to administer shareholder services internally but choose not to outsource.

JEL *classification:* G23; L22; L84

Keywords: Mutual funds; Core competency; Outsourcing; Shareholder services

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In 2013 U.S.-registered investment companies managed approximately $17 trillion for about 98 million U.S. investors (Investment Company Institute 2014). This importance triggered a large and ongoing academic debate on mutual fund managers' skills and characteristics that enable fund managers to generate positive alpha returns for their investors.[1] This popularity comes as no surprise given that fund managers, or, more generally speaking, portfolio management is in general considered as a mutual funds' core competency. On the contrary, the organizational structure of a fund family, that affects the conditions under which member funds can exploit their core business, has caught considerable less attention in the literature.

In this paper, I investigate the consequences arising for mutual funds when they can focus more strongly on their core competency portfolio management through their family's strategic decision to outsource funds' non-core activities.

The industrial organization literature proposes a multitude of theories for 'make-or-buy' decisions that essentially aims to show when a company is best advised to outsource part of its value chain.[2] For instance, sourcing services from external specialists can be preferable to inhouse solutions if the contractor renders the service more efficiently and thus at lower costs or clients' reservation price increases because the service is provided by a prestigious contractor. Accordingly, outsourcing of non-core activities to external providers allows firms to reduce resource consumption in non-core areas as well as to channel their efforts on their core business and thus foster performance (Prahalad and Hamel 1990).

In this spirit, I assess the value created through a stronger portfolio management focus of mutual funds by analyzing how their families' decision to outsource shareholder services

[1] This string of the literature is too vast to cover here. For some recent findings on fund managers' skills see, e.g., Chen, Jegadeesh, and Wermers (2000), Elton, Gruber, and Blake (2012) and Kacperczyk, Nieuwerburgh, and Veldkamp (2014) who analyze fund managers' stock picking and timing abilities. Studies investigating manager characteristics and their relation to fund performance subsume, e.g., an influence of manager experience (Kempf, Manconi, and Spalt 2013), manager tenure (Golec 1996 and Ding and Wermers 2012), manager education (Chevalier and Ellison 1999 and Gottesman and Morey 2006) or manager gender (Niessen-Ruenzi and Ruenzi 2013).

[2] For a review on firms' suitability for 'make-or-buy' decisions see, e.g., Lafontaine and Slade (2007).

impacts on fund expenses and performance. Shareholder services are a suitable testing object for outsourcing of funds' non-core activities for two reasons: First, shareholder services strongly matter for mutual funds on a monetary basis. Gremillion (2005) describes shareholder services as the largest component of funds' expenses after investment management. Similarly, I find that each fund spends approximately $1.7 million per year on shareholder services which represent about 16 percent of their total expense ratio. Therefore, outsourcing of shareholder services presents a substantial potential for cost reductions which in turn are resources – in terms of money – that can be spent on funds' portfolio management.

Second, shareholder services encompass a vast range of standardized and qualitative tasks, e.g., the creation and recordkeeping of shareholder accounts, the transmission of distributions to investors and shareholder communications such as the processing of investor transactions or complaints via mail and telephone. In addition, some of these tasks can have direct consequences for fund managers' operations. For instance, shareholder services produce hundreds of internal reports on a daily basis to help control the operations of the fund complex, e.g., reports on the overall sales activity that help to evaluate cash holdings or shareholder flow management (Gremillion 2005). Therefore, mutual funds can strongly reduce resource consumption in a non-core area – in terms of time – by delegating the execution of these services to external providers.[3]

Taken together, fund families' decision to outsource its funds' shareholder services can release tied resources – in terms of money and time – that can be spend on funds' core competency portfolio management.

Hence, I hypothesize that outsourcing of shareholder services has the following main consequences for mutual funds: First, funds of families that employ external service providers (hereafter, service-outsourced funds) exhibit lower service fees than funds of families that cater

[3] Shareholder service providers are often labeled as 'Transfer Agent' or 'Shareholder Servicing Agent'. For ease of exposition I refer to them as service provider.

for investors' service needs internally (hereafter, service-inhouse funds) because external service providers' very own competitive advantage lies with shareholder services. Second, consistent with the idea that lower resource expenditure on non-core fund activities allow for more resources at the disposal of portfolio management, I hypothesize that funds of families with delegated shareholder services exhibit higher management fees. Third, service-outsourced funds have superior performance relative to service-inhouse funds since they can pursue a stronger portfolio management-oriented fund policy.

I investigate the relation between fund expenses and performance and the service outsourcing status using funds' annual reports N-SAR. Specifically, funds' N-SAR reports contain information on their shareholder service providers that I categorize as outsourced if the service provider is unaffiliated to the fund family. From that I observe that about 58 percent of all funds source shareholder services externally. In addition, consistent with the view of outsourcing as a strategic decision of management companies, I find that fund families either entirely consist of service-outsourced funds or administer all fund related shareholder services internally.

I begin my analysis by comparing fund expenses of service-outsourced funds with service-inhouse funds. Consistent with the first main hypothesis that service-outsourced funds seek to exploit cost reduction potentials in non-core areas, I find that funds with delegated shareholder services exhibit about 32 percent lower service fees than service-inhouse funds. In addition, supporting the second main hypothesis service-outsourced funds exhibit a higher concentration of monetary resources on their core business. In particular, service-outsourced funds have about 10 percent higher management fees than funds that take care of investors' service needs internally.

In my second set of tests I explore how funds' emphasis on portfolio management through service outsourcing impacts on fund performance. Independent from the performance benchmark and net- or gross-of-fee returns, I find that funds of families that delegate

shareholder services to external providers outperform their inhouse peers by up to 91 basis points per year in a multivariate regression approach and by up to 119 basis points in a matched-sample analysis.

In a more detailed exploration, I account for the fact that service outsourcing is only a tangible management decision to fund families if they can effectively improve their member funds' situation through outsourcing. In particular, one would expect that some service-inhouse funds belong to fund families that render shareholder services at comparable levels of efficiency and quality as external providers which puts these funds in the same position to focus on their core business as service-outsourced funds. Thus, funds of families that are very well capable to administer shareholder services internally because they possess the same economies of scale and know-how as an external service provider (hereafter, service-inhouse capable funds) have to be separated from service-inhouse funds that belong to families that are less capable but choose not to source services externally (hereafter, service-inhouse incapable funds). Consistent with this rationale, I observe that the outperformance of service-outsourced funds increases up to 136 basis points and is limited to the comparison with service-inhouse incapable funds.

Furthermore, I consider two alternative explanations for the outperformance of service-outsourced funds. First, service-inhouse funds implicitly put less emphasis on portfolio management as their core competency and are prone to employ portfolio sub-advisors as a means to complement their portfolio management expertise (Del Guercio, Reuter, and Tkac 2007 and Debaere and Evans 2014). However, Chen et al. (2013) show that sub-advised funds underperform internally managed funds on average. Thus, service outsourcing potentially captures the performance difference of this sub-advisor effect. Second, analyzing the distribution channel of funds Del Guercio and Reuter (2014) show evidence that is consistent with a market segmentation into performance-oriented direct-marketed funds and service-oriented brokered funds. Thus another possible explanation for the outperformance of service-

outsourced funds could be that service outsourcing simply proxies for the direct distribution channel. I rule out these possibilities by showing that the outperformance of service-outsourced funds is unaffected by sequentially controlling for sub-advised portfolio management and funds' distribution channels.

To address potential causality concerns that the performance finding is driven by endogeneity problems or not statistically robust I use two different test settings: First, I implement an instrumental variable (IV) approach. As an instrument I use the number of external service providers that offer shareholder services in the state where the management company is located. The idea is that fund families' use of shareholder service outsourcing is more prevalent if the competition among service providers is high. As expected, the first-stage result shows that the decision to cater for investors' service needs internally is strongly negative related to the number of available service providers in the proximity of the fund family. The second-stage regressions suggest an underperformance of service-inhouse incapable funds that becomes even stronger when controlled for endogeneity problems. Second, I employ a permutation test with randomized outsourcing status. Since an insignificant number of permutations yield similar results to the observed underperformance of service-inhouse incapable funds, I conclude that the performance effect is indeed statistically reliable.

Building on the finding that service-inhouse incapable funds' underperform service-outsourced funds, raises the question how service-inhouse incapable funds persist in the market. Hence, I investigate whether service-inhouse incapable funds are made 'responsible' by investors for their weaker focus on portfolio management. Looking at mutual fund flows, I find that service-inhouse incapable funds grow at about 10 percentage points per year less than service-outsourced funds indicating that fund investors seem to care whether shareholder services are outsourced.

Lastly, since funds of families that cater for investors' needs internally are subject to strong negative effects to their market position, I investigate how fund families' management decisions

that directly relate to portfolio management could mitigate the negative performance consequences of retaining non-core activities internally. I explore such possibilities by investigating whether team-managed funds are less subject to a negative performance impact since the non-core work load per portfolio manager is less pronounced than for single-managed funds. As expected, I find that the underperformance of service-inhouse incapable funds is reduced by up to 101 basis points when the fund is team-managed.

This paper is related to a growing number of studies that examine the organizational structure of fund families. For instance, Nanda, Wang, and Zheng (2004) show evidence for fund families' star fund-creating behavior to increase family flows. Gaspar, Massa, and Matos (2006) analyze fund families' favoritism among funds and its impact on family profits. In a more recent study Kacperczyk and Seru (2012) analyze whether centralized or decentralized fund family structures are superior for the investment decision process. Kostovetsky and Warner (2012), Chen et al. (2013), Moreno, Rodriguez, and Zambrana (2013) and Debaere and Evans (2014) investigate the decision of mutual fund families to outsource part of their portfolio management and the impact on fund performance. However, these studies mostly consider cross-sectional differences that directly relate to portfolio management. This paper contributes to the literature in taking a more general view by accounting for the fact that fund families' strategic decisions regarding their organizational structure determine to what extend mutual funds can exploit their core competency portfolio management.

This study is also related to studies that examine the competitive environment in the mutual fund industry which forces fund families to be concerned about how to persist (Wahal and Wang 2011 and Khorana and Servaes 2012). I contribute to this literature by showing that funds of families that externalize their non-core activities can exploit potentials for cost reductions and improve their performance to foster their competitive position in the market.

The remainder of this paper is organized as follows. In Section 1, I discuss the employed data set and sample summary statistics. Section 2 presents the findings on the impact of

shareholder service outsourcing on mutual funds' expenses and performance. Section 3 shows results on how the service outsourcing status impacts on fund performance if service-inhouse funds are separated into service-inhouse capable funds and service-inhouse incapable funds. In Section 4 I explore alternative explanations for the outperformance of service-outsourced funds. In Section 5 I implement an instrumental variable (IV) approach and permutation test to address potential causality concerns. Implications for funds' market position due to a stronger portfolio management-orientation are presented in Section 6. Section 7 shows results on how the negative performance consequences for service-inhouse incapable funds are interrelated to the management structure of funds. Section 8 concludes.

1. Data

1.1 Sources and sample construction

I obtain data on U.S. equity mutual funds between 1996 and 2010 from two sources: CRSP Survivor-Bias-Free U.S. Mutual Fund databases and filings of SEC Form N-SAR.

From the CRSP Mutual Fund databases I obtain information on fund returns, total net assets under management (TNA), expense ratios, fund family identifier and other fund characteristics. Similar to the approach by Pástor and Stambaugh (2002) I assign a fund's investment objective based on the CRSP fund objective code. Since the focus is on actively managed U.S. domestic equity funds I take further steps to eliminate global, international, balanced, fixed-income and index funds. In addition, I exclude fund-year observations for which less than 12 months of gross-of-fee return data is available. If necessary, I aggregate data of share classes to the fund level by weighting the information with the TNA of the classes.

In accordance to the Investment Company Act of 1940 investment companies need to file semi-annual N-SAR reports with the SEC that contain information on a variety of fund

characteristics and their operations.[4] I merge the N-SAR database to CRSP similar to Christoffersen, Evans, and Musto (2013). Among the N-SAR information mutual funds report the name of their shareholder servicing agent during the period (Question 12A on N-SAR, i.e., Q12A). I determine the outsourcing status of a mutual fund's shareholder service by manually checking whether the service provider in N-SAR is affiliated with the management company reported in CRSP.[5] In some instances, mutual funds have more than one service provider. In that case, I classify a fund's shareholder service as outsourced if all service providers are unaffiliated to the management company. In addition, I obtain the funds' total dollar value spent on the shareholder servicing agent(s) (Q72I), total expenses in dollars (Q72X), the number of months that the expense information applies to (Q72A), and the average monthly net assets during the period (Q75B) from N-SAR. I calculate funds' monthly service fees by dividing the (monthly) dollar value spent on the servicing agent(s) (Q72I / Q72A) by the average monthly net assets during the period. Then I annualize the monthly estimate to obtain funds' annual shareholder servicing fees.

The final sample includes 692 fund families, 2,683 unique, actively managed U.S. equity funds and 19,352 fund-year observations.

1.2 Sample characteristics

Table 1 presents summary statistics on family and fund characteristics for the sample. Since the outsourcing decision is a strategic decision on the family level I report the family statistics for the total sample and for both fund families that entirely consist of service-outsourced funds and

[4] Starting in 1996 it became mandatory for mutual funds to file N-SAR reports with the SEC. Thus, to mitigate any selection bias, the sample period begins with the year 1996.

[5] Specifically, the classification of a fund's service outsourcing status is based on a two-step procedure: First, CRSP assigns fund family identifier based on the investment management company that manages the fund. Thus, before determining the service status, I manually cross-check whether the management company reported in CRSP is identical to the advisor reported in N-SAR (Q8A). If the provided information diverge I adjust the CRSP family identifier in accordance to the advisor in N-SAR. In a second step, I compare the name of the service provider in N-SAR with the management company in CRSP and screen for affiliations between both entities using information from the funds' 485APOS and 485BPOS SEC filings as well as LexisNexis.

fund families with no or partially outsourced shareholder services. All other information are at the fund level.

- Insert Table 1 approximately here -

On aggregate service-outsourced funds constitute about 58 percent of the sample. However, as expected, the outsourcing decision is highly concentrated within fund families, i.e., among families that do not entirely consist of service-outsourced funds only 1.85 percent of the funds receive shareholder services from unaffiliated service providers. Looking at fund family size, I observe that families with outsourced shareholder services are much smaller. This is consistent with the idea that families rely on service providers' competitive advantage to realize lower costs through outsourcing than they could realize internally. In addition, fund families with unaffiliated service providers consist of a smaller number of funds. Likewise service-outsourced funds are smaller and younger than service-inhouse funds. Looking at shareholder servicing costs, service-inhouse funds exhibit costs that are significantly higher in absolute terms by about $2.5 billion per year and in relative terms by about 10 basis points of the total expense ratio. On the contrary, consistent with a stronger focus on portfolio management management fees are significantly higher for service-outsourced funds. Furthermore, similar to Chen et al. (2013) and Moreno, Rodriguez, and Zambrana (2013) about 30 percent of all funds are sub-advised, i.e., some of the portfolio management responsibilities are delegated to external management companies. An interesting observation is, however, that the fraction of funds with sub-advised portfolio management is prevalent among service-inhouse funds, which is in line with service-inhouse funds seeking complementary advisory services as expertise betterments.

2. Main results

In this section I explore the three main hypotheses: First, funds of families that delegate their shareholder services to external specialists exhibit lower service fees because they exploit their service providers' competitive advantage in shareholder services. Second, service-outsourced funds have higher expenses on portfolio management since lower resources bound in non-core areas allow for more resources at the disposal of funds' portfolio management. Third, consistent with a stronger portfolio management-oriented fund policy service-outsourced funds generate superior fund performance relative to their inhouse peers.

2.1 Service outsourcing and mutual fund expenses

This section explores the first two main hypotheses that service-outsourced funds exhibit lower service fees than funds of families that take care of investors' service needs internally as well as higher management fees. Service fees are calculated as described in Section 1 using information from N-SAR while information on funds' management fees are from CRSP.[6]

To test for an impact of service outsourcing on mutual funds' service fees and management expenses, I run pooled OLS regressions using these different fund fees as dependent variables:

$$Fee_{i,t} = \alpha + \beta_1 Service\ outsourced_{i,t} + \gamma_1 Ln\ TNA\ family_{i,t-1} + \gamma_2 Family\ Focus_{i,t-1} + \gamma_3 Ln\ TNA_{i,t-1} + \gamma_4 Ln\ age_{i,t} + \gamma_5 Turnover\ ratio_{i,t} + \varepsilon_{i,t}. \quad (1)$$

The main independent variable is $Service\ outsourced_{i,t}$, which is a binary variable that equals one if the service provider of fund i is unaffiliated to its management company in period t and zero otherwise. To control for potential family and fund influences I include, $Ln\ TNA\ family_{i,t-1}$, the logarithm of the fund family's net assets under management,

[6] I report results for the management fee using CRSP estimates because the tests in subsequent sections implicitly employ fee and other information from CRSP. However, due to high correlations between the information provided by CRSP and N-SAR, results of this section with expenses on advisory from N-SAR are qualitatively the same.

$Family\ Focus_{i,t-1}$, the investment concentration of the fund family across investment segments as in Siggelkow (2003), $Ln\ TNA_{i,t-1}$, the logarithm of the fund's total net assets under management, $Ln\ age_{i,t}$, the logarithm of the fund's age, and, $Turnover\ ratio_{i,t}$, the fund's yearly turnover ratio. In addition, I add year and segment fixed effects to control for any unobservable time or segment effects. Furthermore, since service outsourcing is a strategic management decision at the fund family level I cluster standard errors at the family level to account for possible correlations within family groups.

- Insert Table 2 approximately here -

Results from Table 2 clearly support the first main hypothesis that service-outsourced funds have lower service fees. In particular, service-outsourced funds exhibit service fees that are 8 basis points lower than service fees of service-inhouse funds. To put this number into some perspective it is important to note that service-inhouse funds have service fees of approximately 25 basis points per year on average. In other words, service fees of service-outsourced funds are 32 percent lower, consistent with outsourcing as an effective means to exploit potentials for cost reductions in non-core activities of mutual funds. Furthermore, confirming the second main hypothesis, I find that management fees are economically and statistically significant higher for service-outsourced funds. In particular, management fees of funds with outsourced services are higher by about 6 basis points per year, which represents a relative difference of approximately 10 percent of service-inhouse funds' management fee. This shows that fund families' strategic decision to outsource funds' non-core activities increases resources available to funds' actual field of expertise and thus improves the conditions under which funds can exploit their core business.

Regarding the control variables I find no consistent and significant impact across all fund fee measures.

In summary, the results of this set of tests are strongly in favor of the first two main hypotheses that fund families use the delegation of shareholder services to external providers as a means to reduce shareholder servicing costs and to spend relatively more resources – in terms of money – on their funds' portfolio management.

2.2 Service outsourcing and fund performance

In this section I test the third main hypothesis which postulates that service-outsourced funds perform better than service-inhouse funds. I use four different performance measures – fund return, Khorana (1996) objective-adjusted return, Jensen (1968) alpha, and Carhart (1997) four-factor alpha – in a multivariate regression approach to analyze the impact of service outsourcing on mutual fund performance:

$$Performance_{i,t} = \alpha + \beta_1 Service\ outsourced_{i,t} + \gamma_1 Ln\ TNA\ family_{i,t-1} + \gamma_2 Family\ Focus_{i,t-1} + \gamma_3 Ln\ TNA_{i,t-1} + \gamma_4 Ln\ age_{i,t} + \gamma_5 Turnover\ ratio_{i,t} + \varepsilon_{i,t}. \quad (2)$$

I run all tests for net- and gross-of-fee returns. The main independent variable is $Service\ outsourced_{i,t}$, a binary variable that equals one if the service provider of the fund is unaffiliated to its management company and zero otherwise. The remaining controls and standard error adjustments are as in Section 2.1.

- Insert Table 3 approximately here -

Results reported in Table 3 confirm the third main hypothesis that service-outsourced funds exhibit superior performance relative to their inhouse peers. Looking at net-of-fee returns, service-outsourced funds outperform service-inhouse funds independently of the employed performance benchmark. The performance difference is most pronounced for fund returns with about 91 basis points per year on average. Using risk-adjusted performance measures the difference declines to 88 basis points for objective-adjusted returns, 78 basis points for Jensen

alpha, and 50 basis points for Carhart alpha, however, all coefficients remain significant at the 1 percent or 5 percent level of statistical significance. Results for gross-of-fee returns are of a similar magnitude.

Regarding the control variables, the results are consistent with the existing literature. Confirming the findings of Chen et al. (2004) and Siggelkow (2003) I find a positive impact of $Ln\,TNA\,family_{i,t-1}$ and $Family\,Focus_{i,t-1}$ on fund performance. On the contrary, $Ln\,TNA_{i,t-1}$ and $Turnover\,ratio_{i,t}$ impact negatively on performance as described in Berk and Green (2004) and Carhart (1997), respectively.

As a robustness check to the third main hypothesis, I run a matched sample analysis between service-outsourced and service-inhouse funds. Thereby, each service-outsourced fund is matched with an equally weighted portfolio of service-inhouse funds that share the same characteristics. Specifically, in the base model I match a service-outsourced fund to all service-inhouse funds that belong to the same investment segment and $Ln\,TNA\,family_{i,t-1}$ decile in a certain year. I select $Ln\,TNA\,family_{i,t-1}$ as the dominant matching criterion to account for the fact that service outsourcing is a strategic decision at the family level as well as that service-outsourced and service-inhouse funds belong to families that on average strongly differ with respect to size as described in Section 1.1. I account for other family and fund influences by extending the baseline match with other controls from Table 3 that have also been documented to impact on fund performance (see, e.g., Carhart 1997, Siggelkow 2003, Berk and Green 2004, Chen et al. 2004 and Ferreira et al. 2013). Thus, in additional tests I link service-outsourced funds to all service-inhouse funds that, respectively, belong to the same $Family\,Focus_{i,t-1}$, $Ln\,TNA_{i,t-1}$, $Ln\,age_{i,t}$, or $Turnover\,ratio_{i,t}$ decile. Finally, I measure performance differences between service-outsourced funds and the corresponding service-inhouse matching portfolio for the performance measures: fund return, Jensen (1968) alpha, and Carhart (1997) four-factor alpha.

- Insert Table 4 approximately here -

The results from Table 4 clearly confirm the results from Table 3. Independent of the employed performance measure and net- or gross-of-fee returns service-outsourced funds outperform their comparable service-inhouse funds. In particular, the outperformance becomes even larger than in the multivariate approach and amounts up to 119 basis points on average. In addition, the coefficients for all specifications are significant at the 1 percent level.

Overall, the results from Table 3 and Table 4 strongly support the third main hypothesis that service-outsourced funds outperform service-inhouse funds. Hence, funds that can focus more strongly on their actual field of expertise because of their families' decision to reduce responsibilities in funds' non-core activities are associated with superior performances.

3. Service-inhouse funds separated by their families' service capability

Building on earlier results that fund families with service-inhouse funds are significantly larger than fund families who delegate investor services to external providers, one can assume that some inhouse families are equipped with comparable economies of scale and levels of sophistication as some major external service providers. For instance, the assets under management of all actively managed U.S. domestic equity funds of 'T. Rowe Price" amount to approximately $95 billion in the year 2010. At the same time, one of the leading external service provider 'BNY Mellon Investment Services' has about $101 billion assets under administration.

Hence, in this section I extend the main finding that service-outsourced funds outperform service-inhouse funds by accounting for the fact that some service-inhouse funds belong to fund families that do not need to delegate their shareholder services to an external provider since room for improvement is limited, i.e. service-inhouse capable funds, and others that could still gain when their families were to outsource non-core activities that distract them from their actual field of expertise, i.e. service-inhouse incapable funds.

Following the logic outlined above, I determine fund families' capability to administer shareholder services internally based on their assets under management. In particular, I define a service-inhouse fund as a service-inhouse capable fund (service-inhouse incapable fund) if its family's assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families.

In Table 5 I repeat the performance analysis from Section 2 but employ the two binary variables $Service\ inhouse\ capable_{i,t}$ and $Service\ inhouse\ incapable_{i,t}$ as main independent variables. These variables equal one if a service-inhouse fund, respectively, is a service-inhouse capable fund or service-inhouse incapable fund and zero otherwise.

- Insert Table 5 approximately here -

The results from Table 5 confirm the notion that the underperformance of service-inhouse funds is strongly dependent on the capability of their fund families to administer shareholder services internally. As hypothesized, service-inhouse incapable funds underperform service-outsourced funds by up to 136 basis points independent of the employed performance benchmark and net- or gross-of-fee returns. On the contrary, service-inhouse capable funds exhibit no significant performance difference relative to service-outsourced funds. This is plausible since these fund families are equipped with large economies of scale themselves and possess a level of sophistication, which, if any, diminishes the potential for resource improvements. Consequently the release of tied resourced – in terms of money and time – is strongly limited.[7]

Overall, the results from Table 5 show that the underperformance resulting from a weaker portfolio management focus is limited to funds that belong to families that are less capable to administer shareholder services internally but choose not to source services externally.

[7] As an additional check, I repeat the analysis assuming that fund families are capable to administer their funds' shareholder services internally if their assets under management belong to the top size quintile or are above median. Results (not reported) are qualitatively the same.

4. Alternative explanations

In this section I explore two alternative explanations for the observed outperformance of service-outsourced funds. First, it is possible that service outsourcing is simply the flip side of retaining all portfolio management responsibilities, i.e., to pass on the possibility to hire sub-advisors. For instance, Chen et al. (2013) show that sub-advised funds underperform funds that manage their assets internally. Thus, one could argue that the underperformance of funds who cater for investors' service needs internally is simply driven by their need to make up for the lack of portfolio management expertise and thus a prevalence of sub-advisors. Second, a growing number of studies that examine the distribution channel of mutual funds shows that funds that are sold through financial advisors underperform direct-marketed funds (see, e.g., Bergstresser, Chalmers, and Tufano 2009 and Chalmers and Reuter 2014). However, recent evidence by Del Guercio, Reuter, and Tkac (2010) and Del Guercio and Reuter (2014) indicates that the mutual fund market for retail investors is segmented into investors who demand advisory services aside from portfolio management, i.e. the brokered distribution channel of mutual funds, and sophisticated do-it-yourself investors who purely value portfolio management, i.e. the direct channel of mutual funds. Thus, it is possible that the outperformance of service-outsourced funds is simply the counterfactual of this market segmentation. For example, fund families that actively decide to compete for performance-oriented direct channel investors could use service outsourcing as a further means to achieve their strategic goals, while fund families of the brokered channel who aim to cater for their investors' service needs are also the ones that decide against service outsourcing. Hence, another possible explanation is that the outperformance of service-outsourced funds simply captures the performance focus of the direct distribution channel.

4.1 Impact of portfolio sub-advisor

To rule out the possibility that the prevalence of sub-advisors among service-inhouse funds drives their underperformance relative to service-outsourced funds, I repeat the analysis from Table 5 and explicitly control for sub-advisors in a mutual fund. I identify the existence and the name of mutual funds' sub-advisors using information from item Q8A and Q8B in the N-SAR reports filed with the SEC.[8] Since some mutual funds have multiple sub-advisors I follow the example by Chen et al. (2013) and consider a fund as sub-advised if the fund hires at least one sub-advisor.

- Insert Table 6 approximately here -

Results from Table 6 show evidence that is consistent with the findings of Chen, Hong, Jiang, and Kubik (2013), Moreno, Rodriguez, and Zambrana (2013) and Debaere and Evans (2014). Although only significant for Jensen alpha, funds' use of sub-advisors impacts negatively on fund performance. Apart from that, results are similar to those of Table 5, if anything, even gain in statistical and economic significance. Specifically, looking at net-of-fee returns I find that the average difference in performance between service-outsourced and service-inhouse incapable funds amounts to 137 basis points. For risk-adjusted performance measures the difference is about 153 basis points for objective-adjusted returns, 124 basis points for Jensen alpha, and 83 basis points for Carhart alpha. Results for gross-of-fee returns are of a similar magnitude and statistically significant across all performance benchmarks.

4.2 Impact of fund distribution channel

I explore the possibility that service-outsourced funds are simply performance-oriented direct-marketed funds as in Del Guercio and Reuter (2014) by obtaining data on the primary distribution channels of U.S. equity fund shares from Thomson Reuters Lipper (Lipper). Lipper

[8] For earlier studies that follow the same approach see, e.g., Kuhnen (2009), Moreno, Rodriguez, and Zambrana (2013) and Debaere and Evans (2014).

assigns each fund share class either to the direct, indirect, or institutional distribution channel. Share classes that are primarily sold to investors directly are grouped in the direct channel category, shares sold through financial advisors are categorized in the indirect channel, while the institutional distribution channel comprises share classes sold primarily to institutional investors. Since the Lipper classification is at the share class level I define a fund's distribution channel based on the share's channel that encompasses at least 50 percent of the fund's assets similar to Del Guercio, Reuter, and Tkac (2010) and Del Guercio and Reuter (2014). To ensure comparability to related studies I eliminate all fund-year observations that belong to the institutional channel from this analysis.

- Insert Table 7 approximately here -

Results from Table 7 confirm that there is a positive performance difference between direct and indirect sold funds consistent with the results of Bergstresser, Chalmers, and Tufano (2009), Chalmers and Reuter (2014), and Del Guercio and Reuter (2014). However, controlling for funds' distribution channel does not dampen the outperformance of service-outsourced funds relative to service-inhouse incapable funds.

5. Causality concerns

In this section I rule out remaining causality concerns for the outperformance of service-outsourced funds relative to service-inhouse incapable funds. Specifically, in subsection 5.1 I employ an instrumental variable approach to investigate whether uncontrolled or unobservable characteristics drive the outperformance of service-outsourced funds. In subsection 5.2 I examine whether the performance difference is statistically reliable by using a permutation test.

5.1 Instrumental variable analysis

To address the possibility that the observed outperformance of service-outsourced funds is attributable to endogeneity problems I implement an instrumental variable approach. As an

instrument for funds' outsourcing status I employ $Number\ service\ providers\ in\ state_{i,t}$. $Number\ service\ providers\ in\ state_{i,t}$ represents the logarithm of 1 plus the number of service companies that render shareholder services in the state where the funds' management company is located. To be considered as a good instrument the number of service providing companies in the state of the fund's management company needs to be correlated with the service outsourcing status but correlated with fund performance solely because of the outsourcing decision. I propose that $Number\ service\ providers\ in\ state_{i,t}$ serves as such a good instrument since I expect funds to be less likely to cater for investors' service needs internally if the competition among external service providers is high, i.e., the number of available service providers in the proximity of the fund's management company is high.

I identify the state where funds' management companies are located using information from item Q8D in the N-SAR reports filed with the SEC. Since the dependent variable $Service\ inhouse\ incapable_{i,t}$ is a binary variable that equals one if the service-inhouse fund belongs to a fund family that is less capable to cater for investors' service needs internally and zero otherwise, I employ a two-stage residual inclusion (2SRI) model as in Chen et al. (2013).[9] The first-stage specification is:

$$\begin{aligned} Service\ inhouse\ incapable_{i,t} = {} & \alpha + \beta_1 Number\ service\ providers\ in\ state_{i,t} + \\ & \gamma_1 Ln\ TNA\ family_{i,t-1} + \gamma_2 Family\ Focus_{i,t-1} + \\ & \gamma_3 Ln\ TNA_{i,t-1} + \gamma_4 Ln\ age_{i,t} + \\ & \gamma_5 Turnover\ ratio_{i,t} + \varepsilon_{i,t}, \end{aligned} \quad (3)$$

whereby the main independent variable is $Number\ service\ providers\ in\ state_{i,t}$. The remaining control variables are defined as in Section 2. In addition, the first-stage regressions

[9] Hence, the analysis of this subsection is restricted to the observations of service-outsourced funds and service-inhouse incapable funds.

include time and segment fixed effects and standard errors that are clustered at the fund family level.[10]

- Insert Table 8 approximately here -

The results of Table 8 confirm the notion of a strong and significantly negative impact of the competition among service providers on fund families' decision to administer shareholder services internally. Specifically, the coefficient on $Number\ service\ providers\ in\ state_{i,t}$ suggests that a one standard deviation increase in the log number of services companies who do business in the state that the fund's management company is located (0.60) decreases the likelihood that the fund's shareholder services are internally administered by about 34 percent.

In the second-stage I regress mutual fund performance on the binary variable $Service\ inhouse\ incapable_{i,t}$ and include $First\ stage\ residual_{i,t}$, the residual from the first-stage regression, as additional independent variable.

- Insert Table 9 approximately here -

The results of the second-stage regressions show a strong and significantly negative impact of $Service\ inhouse\ incapable_{i,t}$ on fund performance. In particular, controlling for endogeneity, the effect of administering shareholder services internally reduces fund performance by 4.01 to 5.86 percentage points per year and is significant independent of the employed performance measure. In addition, I observe in almost all specifications a significant and positive effect of $First\ stage\ residual_{i,t}$ on fund performance indicating an endogenous effect that was not yet controlled before.

[10] In this and subsequent analyses I employ the (full) sample as in Table 5 to test for an impact of service outsourcing on fund performance. However, as additional check I repeat the analysis including all additional controls from the alternative explanations of Section 4, i.a. the sample is restricted to the observations that belong to funds that are marketed either directly to investors or brokered through financial advisors. The results (not reported) are qualitatively the same.

Taken together, results of Table 9 show that the underperformance of service-inhouse incapable funds is robust for the instrumental variable test and, in fact, becomes even larger when controlled for endogeneity.

5.2 Permutation test

I explore the concern that the finding of an outperformance of service-outsourced funds is not statistically robust by running a permutation test. In particular, I randomly assign the outsourcing status to funds' shareholder service and measure the multivariate performance difference between service-outsourced funds and service-inhouse incapable funds. This process is repeated 10,000 times which yield the exact distribution of performance differences under the null hypothesis that the service outsourcing status does not matter. Accordingly, p-values are equal to the fraction of permutations that show an effect that are at least as strong as the performance difference observed in Table 5.

- Insert Table 10 approximately here -

The results of Table 10 strongly support earlier findings that service-inhouse incapable funds underperform service-outsourced funds. Specifically, the coefficient on $Service\ inhouse\ incapable_{i,t}$ is significant at the 1 percent level in all specifications indicating that only a very small number of permutations yield a performance difference between service-inhouse incapable funds and service-outsourced funds that is as strong as in Table 5. Hence, the performance difference is statistically reliable.

6. Market implications for service-inhouse incapable funds

Building on the observation that service-inhouse incapable funds underperform service-outsourced funds, I investigate the implications for service-inhouse incapable funds' market position resulting from their weaker on portfolio management-orientation. I analyze mutual

fund flows to examine whether investors penalize service-inhouse incapable funds' implicit decision to focus less strongly on portfolio management relative to service-outsourced funds.

Specifically, I relate the service outsourcing status of mutual funds to their net-inflows using the method suggested by Sirri and Tufano (1998) to estimate net-inflows, $Flow_{i,t}$, for each fund i and period t as:

$$Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + R_{i,t})}{TNA_{i,t-1}}, \quad (4)$$

whereby $TNA_{i,t}$ represents the total net assets under management and $R_{i,t}$ the total net-of-fee return of fund i in period t. Thus, $Flow_{i,t}$ denotes the percentage growth rate of fund i in period t adjusted for the fund's internal growth. The main independent variables are the binary variables $Service\ inhouse\ capable_{i,t}$ and $Service\ inhouse\ incapable_{i,t}$, which equal one, respectively, if the fund is a service-inhouse capable fund or service-inhouse incapable fund. In addition, I include several characteristics that have been documented to affect funds' net-inflows. In particular, a number of studies show a non-linear influence of past performance on net-inflows (see, e.g., Ippolito 1992, Chevalier and Ellison 1997, and Sirri and Tufano 1998). Hence, I control for past performance using a quadratic performance rank of the fund (Barber, Odean, and Zheng 2005).[11] Alternatively, I use a piecewise linear regression approach as in Sirri and Tufano (1998), whereby I estimate three slope coefficients based on the performance rank of the fund: one coefficient for the $Bottom\ quintile_{i,t-1}$, one for the $Middle\ quintiles_{i,t-1}$, and one for the $Top\ quintile_{i,t-1}$.[12] Furthermore, I include $Ln\ TNA\ family_{i,t-1}$ and $Family\ Focus_{i,t-1}$ to account for fund family influences on flows. Finally, I control for fund characteristics by including $Ln\ TNA_{i,t-1}$, $Ln\ age_{i,t}$,

[11] Funds' performance ranks, $PerfRank_{i,t-1}$, are calculated based on funds' net-of-fee returns for each year and segment and are evenly distributed between 0 and 1.

[12] Specifically, I estimate the coefficients for the three groups according to the following definitions: $Bottom\ quintile_{i,t-1} = \min(PerfRank_{i,t-1}; 0.2)$, $Middle\ quintiles_{i,t-1} = \min(PerfRank_{i,t-1} - Bottom\ quintile_{i,t-1}; 0.6)$ and $Top\ quintile_{i,t-1} = PerfRank_{i,t-1} - (Bottom\ quintile_{i,t-1} + Middle\ quintiles_{i,t-1})$.

$Turnover\ ratio_{i,t}$ as defined in Section 2 as well as funds' $Expense\ ratio_{i,t}$ and past fund flows, $Flow_{i,t-1}$, since Gruber (1996) and Sirri and Tufano (1998) show a positive influence of past flows on subsequent flows. I run pooled OLS regressions with time and segment fixed effects and cluster standard errors at the fund family level.

- Insert Table 11 approximately here -

The results of Table 11 clearly show that service-inhouse incapable funds exhibit significantly lower net-inflows than service-outsourced funds. The coefficients for $Service\ inhouse\ incapable_{i,t}$ suggest that service-inhouse incapable funds grow by about 10 percentage points per year less than their service-outsourced peers. On the contrary, I find no significant difference between service-inhouse capable funds and service-outsourced funds. This result is robust, independent of the employed performance control (the quadratic performance rank in column 1 and 2 or the piecewise linear regression approach in column 3). The relation between the remaining control variables and net-inflows of mutual funds are in line with the findings of previous studies (see, e.g., Gruber 1996, Chevalier and Ellison 1997, Sirri and Tufano 1998, Bergstresser and Poterba 2002, and Del Guercio and Tkac 2002).

Taken together, the results from Table 11 show that service-inhouse incapable funds exhibit significantly lower growth rates than their competitors. Thus, the weaker portfolio management focus of service-inhouse incapable funds seems to matter to investors, or, in other words, funds that can emphasize their core competency through their families' delegation of shareholder services to external providers can strengthen their market position.

7. Single- vs team-managed funds

Considering that service-inhouse incapable funds are subject to strong negative effects to their market position I explore in this section how funds' management structure that directly relates to portfolio management could mitigate the negative performance consequences. Such a

distinctive feature of funds that could be interrelated to the performance consequences of service outsourcing is whether funds are single- or team-managed. For instance, since the non-core work load per manager is lower for team-managed funds, I expect that the release of tied resources through outsourcing – especially in terms of time – is less important for team-managed funds than for single-managed funds.

I determine the management structure of mutual funds using information about funds' management structures from CRSP. Specifically, I classify funds as team-managed when CRSP reports management names as 'Team-Managed' or of two or more fund managers. Since there is mixed evidence of a general performance difference between single- and team-managed funds (see, e.g., Prather, Bertin, and Henker 2004, Karagiannidis 2010, Bär, Kempf, and Ruenzi 2011, and Patel and Sarkissian 2014), I investigate the impact of service outsourcing on fund performance for both subsamples of single- and team-managed funds.

The main independent variables for the subsamples in Panel A (single-managed funds) and Panel B (team-managed funds) are $Service\ inhouse\ capable_{i,t}$ and $Service\ inhouse\ incapable_{i,t}$ defined as in Table 5.

- Insert Table 12 approximately here -

The results from Table 12 confirm the findings of Table 5 that service-inhouse incapable funds underperform their service outsourced peers. However, the results also show that the underperformance among single-managed funds is considerably stronger than for team-managed funds. In particular, the underperformance of single-managed service-inhouse incapable funds ranges from 138 to 195 basis points per year, while the underperformance of team-managed service-inhouse incapable funds is capped at 121 basis points. This translates to a maximum difference in relative performance of service-inhouse incapable funds of about 101 basis points for Carhart alpha.

Taken together, the results of Table 12 strongly support the initial hypothesis that the management decision to team-manage funds is an effective means to lessen the negative impact of retaining non-core competencies internally.

8. Summary and conclusion

In the mutual fund industry thousands of management companies using more than ten thousand mutual funds compete for investor flows and market share (Investment Company Institute 2014). The industrial organization literature suggests that one way to cope with such a situation of fierce competition and to develop sustainable competitive advantages is for companies to focus on their core competencies while reducing resource consumption in non-core objectives. In the mutual fund context, one would expect that funds exclusively focus on portfolio management and eliminate responsibilities in non-core activities. However, although a substantial number of studies identify manager or fund characteristics that represent sources of success within portfolio management, little is known about the organizational structure that encompasses portfolio management and thus determines portfolio management's amount of available resources.

In this paper, I address this gap by being the first that documents that funds' expenses and performance are improved when they can focus more strongly on portfolio management through their families' strategic decision to outsource funds' shareholder services. Funds' shareholder services comprise a multitude of services and constitute substantial costs which makes them natural candidates for the analysis of an impact of outsourcing on funds' operations.

Emphasizing the importance of outsourcing as a strategic decision at the family level I find that mutual fund companies either delegate all shareholder services to external specialists or take care of investors' service needs for all funds internally. In addition, I observe that service-outsourced funds exhibit substantially lower service costs relative to their inhouse peers.

Importantly, the stronger emphasis on portfolio management of service-outsourced funds is associated with a superior fund performance of up to 91 basis points per year which becomes even larger once service-outsourced funds are compared with service-inhouse funds that are less capable to administer shareholder services internally but choose not to source externally. Extending this finding I observe that these internally administered funds grow at lower rates than service-outsourced funds. However, management decisions that directly relate to portfolio management such as running funds in a team-management structure can reduce the negative performance consequences associated with retaining non-core activities internally.

Concluding, this paper shows that funds which focus on their core business can gain a competitive edge and that outsourcing of non-core activities can be an effective means for their success. In addition, the results of this paper highlight the need for future research to account for the conditions provided by a fund families that determine their member funds' capabilities to exploit their core competency.

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Table 1
Sample characteristics by service outsourcing status
This table reports descriptive statistics for the total sample (Total) and both funds that delegate their shareholder services to unaffiliated service providers (Outsourced) and funds that administer shareholder services internally (Inhouse). Fund family characteristics are reported for fund families that entirely consist of service-outsourced funds and those with no or partially service-outsourced funds. All other characteristics are reported at the fund level. Number of families, represents the number of families within each group. Family size, is the total net assets under management of the fund family in millions of dollars. Number of funds in family, represents the number of funds within a fund family. Family focus, represents the concentration of a fund family across investment objectives defined as in Siggelkow (2003). Number of funds, is the number of total funds and both the number of service-outsourced and service-inhouse funds. Fund size, represents the total net assets under management in millions of dollars. Fund age, represents the fund age in years. Turnover ratio, is the fund turnover. Service fee, represents the costs spent on shareholder servicing and is measured in thousands of dollars and as percentage points relative to total net assets under management. Management fee and Expense ratio, are reported in percentage points and represents funds' fees charged for portfolio management and total services respectively. Advisor outsourced, represents the fraction of sub-advised funds, whereby a fund is defined as outsourced if the fund has at least one sub-advisor similar to Chen et al. (2013). The last column of the table reports the difference in fund family and fund statistics between the outsourced and inhouse group. ***, **, * denote statistical significance for the difference in means between both groups at the 1%, 5%, and 10% significance level, respectively.

	Total	Outsourced	Inhouse	Difference	
Family characteristics:					
Fraction of service outsourced (%)		100.00	1.85		
Number of families	692	575	175		
Family size (in million USD)	4,014.43	1,302.67	12,098.94	-10,796.27	***
Number of funds in family	3.91	2.59	7.84	-5.24	***
Family focus (%)	75.04	80.35	59.21	21.14	***
Fund characteristics:					
Number of funds	2,683	1,545	1,415		
Fund size (in million USD)	1,046.03	515.88	1,571.03	-1,055.15	***
Fund age	8.76	7.66	10.02	-2.35	***
Turnover ratio (%)	104.04	97.24	110.79	-13.55	***
Service fee (in tsd. USD)	1,702.15	439.17	2,957.25	-2,518.08	***
Service fee (%)	0.21	0.16	0.25	-0.10	***
Management fee (%)	0.62	0.64	0.61	0.04	***
Expense ratio (%)	1.31	1.33	1.28	0.05	***
Advisor outsourced (%)	29.98	25.01	35.18	-10.17	***

Table 2
Mutual fund expenses

This table presents results from pooled OLS regressions that analyze the impact of service outsourcing on mutual fund fees. Funds' service fees are based on information in N-SAR, while funds' management fees are from CRSP. The main independent variable is Service outsourced, a binary variable that equals one if all service providers of the fund are unaffiliated to the fund's management company and zero otherwise. Additional independent controls include Ln TNA family, Family focus, Ln TNA, Ln age, Turnover ratio. Ln TNA family, is the logarithm of the fund family's assets under management (measured in millions of dollars). Family focus, represents the concentration of a fund family across investment objectives defined as in Siggelkow (2003). Ln TNA, represents the logarithm of the fund's total net assets under management. Ln TNA family, Family focus, Ln TNA are all lagged by one year. Ln age, is the logarithm of the fund's age in years. Turnover ratio is the fund's yearly turnover ratio. Regressions are run with year and segment fixed effects. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Dependent variable:	Service fee	Management fee
Service outsourced	-0.0008 ***	0.0006 *
	(0.0000)	(0.0912)
Ln TNA family	0.0001	-0.0007 ***
	(0.2173)	(0.0000)
Family focus	0.0000	-0.0003
	(0.8856)	(0.6203)
Ln TNA	-0.0001	0.0016 ***
	(0.1153)	(0.0000)
Ln age	0.0002 ***	0.0002
	(0.0030)	(0.1476)
Turnover ratio	0.0000	0.0002 ***
	(0.5519)	(0.0003)
Year fixed effects	Yes	Yes
Segment fixed effects	Yes	Yes
Number of Observations	17,531	17,531
Adj.-R^2	0.0647	0.147

Table 3
Mutual fund performance

This table presents results from pooled OLS regressions that analyze the impact of service outsourcing on mutual fund performance using four different performance measures: Fund return (Return), Khorana (1996) objective-adjusted return (OAR), Jensen (1968) alpha (Jensen), and Carhart (1997) four-factor alpha (Carhart). Results are reported for net and gross-of-fee returns separately. The main independent variable is Service outsourced, a binary variable that equals one if all service providers of the fund are unaffiliated to the fund's management company and zero otherwise. Additional independent controls include Ln TNA family, Family focus, Ln TNA, Ln age, Turnover ratio. Ln TNA family, is the logarithm of the fund family's assets under management (measured in millions of dollars). Family focus, represents the concentration of a fund family across investment objectives defined as in Siggelkow (2003). Ln TNA, represents the logarithm of the fund's total net assets under management. Ln TNA family, Family focus, Ln TNA are all lagged by one year. Ln age, is the logarithm of the fund's age in years. Turnover ratio is the fund's yearly turnover ratio. Regressions are run with year and segment fixed effects. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service outsourced	0.0091 ***	0.0088 ***	0.0078 ***	0.0050 **	0.0076 ***	0.0071 ***	0.0061 **	0.0033
	(0.0004)	(0.0011)	(0.0013)	(0.0313)	(0.0031)	(0.0080)	(0.0108)	(0.1466)
Ln TNA family	0.0049 ***	0.0049 ***	0.0034 ***	0.0023 ***	0.0044 ***	0.0043 ***	0.0029 ***	0.0018 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0014)
Family focus	0.0138 **	0.0152 **	0.0127 **	0.0086 *	0.0152 ***	0.0163 ***	0.0139 ***	0.0099 **
	(0.0140)	(0.0137)	(0.0177)	(0.0791)	(0.0067)	(0.0074)	(0.0083)	(0.0405)
Ln TNA	-0.0071 ***	-0.0067 ***	-0.0038 ***	-0.0012 *	-0.0080 ***	-0.0076 ***	-0.0046 ***	-0.0021 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0513)	(0.0000)	(0.0000)	(0.0000)	(0.0002)
Ln age	0.0095 ***	0.0073 ***	0.0042 ***	-0.0017	0.0100 ***	0.0081 ***	0.0048 ***	-0.0012
	(0.0000)	(0.0000)	(0.0054)	(0.1845)	(0.0000)	(0.0000)	(0.0009)	(0.3073)
Turnover ratio	-0.0022 **	-0.0009	-0.0015 ***	-0.0014	-0.0021 ***	-0.0009	-0.0014 ***	-0.0013
	(0.0116)	(0.2983)	(0.0038)	(0.1567)	(0.0081)	(0.3522)	(0.0063)	(0.1480)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	19,119	19,119	19,119	19,119	19,119	19,119	19,119	19,119
Adj.-R^2	0.7321	0.0044	0.1527	0.1011	0.7339	0.0048	0.1545	0.1017

Table 4
Matched sample analysis

This table presents results from a matched sample analysis where each service-outsourced fund is matched with an equally weighted portfolio of service-inhouse funds using the following matching criteria: Year, Segment, Ln TNA family, Family focus, Ln TNA, Ln age, and Fund turnover. Results are reported for net-of fee returns in Panel A and gross-of-fee returns in Panel B. In the first row of each Panel, service-outsourced funds are matched to all service-inhouse funds that belong to the same segment and the same LN TNA family decile in a certain year. In rows two through five I use the decile ranking based on Family focus, Ln TNA, Ln age, and Turnover ratio as additional matching criterion. Then performances differences between service-outsourced funds and the corresponding inhouse matching portfolio are tested for the performance measures Fund return (Return), Jensen (1968) alpha (Jensen), and Carhart (1997) four-factor alpha (Carhart). ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Panel A: Net-of-fee returns

		Dependent variable:		
Matching characteristics	Observations	Return	Jensen	Carhart
Year, Segment, and Ln TNA family	9,432	0.0119 ***	0.0104 ***	0.0068 ***
		(0.0000)	(0.0000)	(0.0000)
Year, Segment, Ln TNA family, and Family focus	4,859	0.0087 ***	0.0073 ***	0.0065 ***
		(0.0000)	(0.0000)	(0.0001)
Year, Segment, Ln TNA family, and Ln TNA	6,305	0.0108 ***	0.0092 ***	0.0073 ***
		(0.0000)	(0.0000)	(0.0000)
Year, Segment, Ln TNA family, and Ln age	5,508	0.0069 ***	0.0076 ***	0.0051 ***
		(0.0002)	(0.0000)	(0.0020)
Year, Segment, Ln TNA family, and Turnover ratio	5,154	0.0086 ***	0.0084 ***	0.0072 ***
		(0.0000)	(0.0000)	(0.0000)

Panel B: Gross-of-fee returns

		Dependent variable:		
Matching characteristics	Observations	Return	Jensen	Carhart
Year, Segment, and Ln TNA family	9,432	0.0114 ***	0.0099 ***	0.0063 ***
		(0.0000)	(0.0000)	(0.0000)
Year, Segment, Ln TNA family, and Family focus	4,859	0.0087 ***	0.0076 ***	0.0068 ***
		(0.0000)	(0.0000)	(0.0000)
Year, Segment, Ln TNA family, and Ln TNA	6,305	0.0105 ***	0.0090 ***	0.0071 ***
		(0.0000)	(0.0000)	(0.0000)
Year, Segment, Ln TNA family, and Ln age	5,508	0.0062 ***	0.0071 ***	0.0045 ***
		(0.0008)	(0.0000)	(0.0054)
Year, Segment, Ln TNA family, and Turnover ratio	5,154	0.0079 ***	0.0078 ***	0.0066 ***
		(0.0000)	(0.0000)	(0.0000)

Table 5

Service-inhouse funds grouped by their families' service capability

This table presents results from pooled OLS regressions that analyze the impact of funds' service outsourcing status on mutual fund performance using four different performance measures: Fund return (Return), Khorana (1996) objective-adjusted return (OAR), Jensen (1968) alpha (Jensen), and Carhart (1997) four-factor alpha (Carhart). Results are reported for net and gross-of-fee returns separately. The Service outsourced variable from previous tables is replaced by two binary variables, Service inhouse capable and Service inhouse incapable, which equal one if the service-inhouse fund, respectively, belongs to a fund family that is capable to administer its shareholder services internally or incapable and zero otherwise. I define a service-inhouse fund as capable (incapable) to administer its shareholder services internally if the fund belongs to a fund family whose assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families within a year. Other independent controls are defined as in Table 3. Regressions are run with year and segment fixed effects. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse capable	-0.0028	-0.0007	-0.0016	-0.0010	-0.0003	0.0022	0.0013	0.0019
	(0.4242)	(0.8635)	(0.6521)	(0.7558)	(0.9374)	(0.5634)	(0.7013)	(0.5201)
Service inhouse incapable	-0.0136 ***	-0.0146 ***	-0.0123 ***	-0.0078 ***	-0.0128 ***	-0.0139 ***	-0.0115 ***	-0.0070 **
	(0.0000)	(0.0000)	(0.0000)	(0.0083)	(0.0000)	(0.0000)	(0.0000)	(0.0142)
Ln TNA family	0.0039 ***	0.0036 ***	0.0024 ***	0.0017 **	0.0032 ***	0.0027 ***	0.0016 **	0.0009
	(0.0000)	(0.0001)	(0.0026)	(0.0183)	(0.0001)	(0.0018)	(0.0287)	(0.1705)
Family focus	0.0121 **	0.0128 **	0.0110 **	0.0075	0.0131 **	0.0136 **	0.0119 **	0.0084 *
	(0.0366)	(0.0434)	(0.0494)	(0.1365)	(0.0224)	(0.0306)	(0.0316)	(0.0899)
Ln TNA	-0.0070 ***	-0.0065 ***	-0.0037 ***	-0.0012 *	-0.0079 ***	-0.0075 ***	-0.0045 ***	-0.0020 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0663)	(0.0000)	(0.0000)	(0.0000)	(0.0004)
Ln age	0.0094 ***	0.0072 ***	0.0042 ***	-0.0017	0.0099 ***	0.0081 ***	0.0047 ***	-0.0012
	(0.0000)	(0.0000)	(0.0060)	(0.1834)	(0.0000)	(0.0000)	(0.0010)	(0.3021)
Turnover ratio	-0.0021 **	-0.0008	-0.0014 **	-0.0014	-0.0020 **	-0.0007	-0.0013 **	-0.0012
	(0.0243)	(0.3595)	(0.0102)	(0.1931)	(0.0210)	(0.4148)	(0.0149)	(0.1994)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	19,119	19,119	19,119	19,119	19,119	19,119	19,119	19,119
Adj.-R^2	0.7323	0.0052	0.1532	0.1014	0.7341	0.0059	0.1554	0.1022

Table 6
Sub-advisor control

This table presents results from pooled OLS regressions that analyze the impact of service outsourcing on mutual fund performance. The main independent variables are the binary variables Service inhouse capable and Service inhouse incapable, which equal one if the service-inhouse fund, respectively, belongs to a fund family that is capable to administer its shareholder services internally or incapable and zero otherwise. A service-inhouse fund is defined as capable (incapable) to administer its shareholder services internally if the fund belongs to a fund family whose assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families within a year. Additional independent controls include: Advisor outsourced, a binary variable that equals one if the fund has at least one sub-advisor and zero otherwise similar to Chen et al. (2013). Other independent variables and fixed effects are defined as in Table 3. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse capable	-0.0037	-0.0022	-0.0023	-0.0016	-0.0011	0.0007	0.0006	0.0013
	(0.2885)	(0.5560)	(0.4978)	(0.6008)	(0.7365)	(0.8465)	(0.8465)	(0.6706)
Service inhouse incapable	-0.0137 ***	-0.0153 ***	-0.0124 ***	-0.0083 ***	-0.0131 ***	-0.0148 ***	-0.0119 ***	-0.0077 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0067)	(0.0000)	(0.0000)	(0.0000)	(0.0091)
Advisor outsourced	-0.0024	-0.0030	-0.0041 **	-0.0027	-0.0014	-0.0021	-0.0033	-0.0018
	(0.3437)	(0.2604)	(0.0444)	(0.1633)	(0.5645)	(0.4161)	(0.1106)	(0.3467)
Ln TNA family	0.0040 ***	0.0038 ***	0.0025 ***	0.0018 **	0.0034 ***	0.0029 ***	0.0017 **	0.0010
	(0.0000)	(0.0001)	(0.0015)	(0.0135)	(0.0000)	(0.0011)	(0.0208)	(0.1412)
Family focus	0.0118 **	0.0122 *	0.0094	0.0061	0.0132 **	0.0132 **	0.0106 *	0.0073
	(0.0496)	(0.0546)	(0.1011)	(0.2504)	(0.0271)	(0.0350)	(0.0613)	(0.1620)
Ln TNA	-0.0070 ***	-0.0067 ***	-0.0036 ***	-0.0011	-0.0079 ***	-0.0076 ***	-0.0045 ***	-0.0020 ***
	(0.0000)	(0.0000)	(0.0000)	(0.1076)	(0.0000)	(0.0000)	(0.0000)	(0.0013)
Ln age	0.0095 ***	0.0074 ***	0.0039 **	-0.0020	0.0101 ***	0.0083 ***	0.0046 ***	-0.0013
	(0.0000)	(0.0001)	(0.0109)	(0.1352)	(0.0000)	(0.0000)	(0.0014)	(0.2665)
Turnover ratio	-0.0022 **	-0.0009	-0.0015 ***	-0.0014	-0.0021 **	-0.0009	-0.0013 **	-0.0012
	(0.0211)	(0.2811)	(0.0078)	(0.1879)	(0.0188)	(0.3311)	(0.0113)	(0.1971)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	18,101	18,101	18,101	18,101	18,101	18,101	18,101	18,101
Adj.-R^2	0.7362	0.0052	0.1516	0.0999	0.7380	0.0061	0.1536	0.1005

Table 7
Distribution channel control

This table presents results from pooled OLS regressions that analyze the impact of service outsourcing on mutual fund performance. The sample is restricted to the observations that belong to funds that are marketed either directly to investors or brokered through financial advisors. I classify a fund as belonging to the direct (financial advisor) distribution channel based on classification provided by Thomson Reuters Lipper. The main independent variables are the binary variables Service inhouse capable and Service inhouse incapable, which equal one if the service-inhouse fund, respectively, belongs to a fund family that is capable to administer its shareholder services internally or incapable and zero otherwise. A service-inhouse fund is defined as capable (incapable) to administer its shareholder services if the fund belongs to a fund family whose assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families within a year. Additional independent controls include: Direct channel, a binary variable that equals one if the fund is marketed directly to fund investors. Other independent variables and fixed effects are defined as in Table 6 and not reported for brevity. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse capable	-0.0047	-0.0034	-0.0030	-0.0019	-0.0031	-0.0016	-0.0011	0.0000
	(0.2520)	(0.4448)	(0.4678)	(0.6250)	(0.4381)	(0.7200)	(0.7912)	(0.9898)
Service inhouse incapable	-0.0156 ***	-0.0159 ***	-0.0135 ***	-0.0073 **	-0.0164 ***	-0.0169 ***	-0.0144 ***	-0.0082 **
	(0.0001)	(0.0001)	(0.0003)	(0.0299)	(0.0000)	(0.0000)	(0.0001)	(0.0117)
Direct channel	0.0061 **	0.0070 **	0.0051 *	0.0038	0.0021	0.0026	0.0007	-0.0006
	(0.0299)	(0.0237)	(0.0569)	(0.1526)	(0.4339)	(0.3670)	(0.7691)	(0.8025)
Advisor outsourced	-0.0046	-0.0056 *	-0.0044	-0.0022	-0.0044	-0.0054 *	-0.0044	-0.0022
	(0.1335)	(0.0581)	(0.1036)	(0.3689)	(0.1518)	(0.0676)	(0.1032)	(0.3665)
Ln TNA family	0.0040 ***	0.0037 ***	0.0026 **	0.0021 **	0.0034 ***	0.0028 ***	0.0018 *	0.0013
	(0.0001)	(0.0013)	(0.0105)	(0.0193)	(0.0007)	(0.0095)	(0.0615)	(0.1225)
Family focus	0.0073	0.0077	0.0047	0.0041	0.0082	0.0082	0.0055	0.0049
	(0.3277)	(0.3250)	(0.5011)	(0.5308)	(0.2764)	(0.3001)	(0.4322)	(0.4513)
Ln TNA	-0.0078 ***	-0.0070 ***	-0.0040 ***	-0.0013	-0.0090 ***	-0.0082 ***	-0.0051 ***	-0.0025 ***
	(0.0000)	(0.0000)	(0.0001)	(0.1205)	(0.0000)	(0.0000)	(0.0000)	(0.0016)
Ln age	0.0100 ***	0.0071 ***	0.0038 *	-0.0018	0.0105 ***	0.0080 ***	0.0045 **	-0.0011
	(0.0000)	(0.0015)	(0.0537)	(0.2846)	(0.0000)	(0.0001)	(0.0118)	(0.4422)
Turnover ratio	-0.0025 **	-0.0018 ***	-0.0020 ***	-0.0015	-0.0024 **	-0.0017 ***	-0.0018 ***	-0.0014
	(0.0142)	(0.0087)	(0.0006)	(0.1836)	(0.0141)	(0.0088)	(0.0005)	(0.2003)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	12,406	12,406	12,406	12,406	12,406	12,406	12,406	12,406
Adj.-R^2	0.7270	0.0066	0.1478	0.0919	0.7294	0.0083	0.1497	0.0922

Table 8
First stage of 2SRI – The impact of the number of service providing companies located in the state of the fund's management company on outsourcing
This table presents results from the logit fist-stage regression of the 2SRI estimation of the effect of shareholder service outsourcing on performance. The sample is restricted to the observations that belong to service-outsourced funds and service-inhouse incapable funds. The first-stage regression measures the effect of the competitive environment among service providing companies on whether the mutual fund administers shareholder services internally. The dependent variable is the indicator variable service-inhouse incapable, which equals one if the service-inhouse fund belongs to a fund family that is incapable to administer its shareholder services internally and zero otherwise. The main independent variable is Number service providers in state, which represents the number of service companies that provide external shareholder services in the state that the fund's management company is located. Other independent variables and fixed effects are defined as in Table 3. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Dependent variable:	Service inhouse incapable	
Number service providers in state	-0.5777	***
	(0.0028)	
Ln TNA family	0.1422	*
	(0.0680)	
Family focus	-1.6678	***
	(0.0006)	
Ln TNA	-0.1336	**
	(0.0191)	
Ln age	0.4043	***
	(0.0002)	
Turnover ratio	0.1133	*
	(0.0785)	
Year fixed effects	Yes	
Segment fixed effects	Yes	
Number of Observations	12,282	
Pseudo-R^2	0.0791	

Table 9

Second stage of 2SRI – The impact of shareholder service outsourcing on fund performance

This table presents results from the second-stage regression of the 2SRI estimation of the effect of shareholder service outsourcing on performance. The main independent variable is Service inhouse incapable, which is a binary variable that equals one if the service-inhouse fund belongs to a fund family that is incapable to administer its shareholder services internally and zero otherwise. I define a service-inhouse fund as incapable to administer its shareholder services internally if the fund belongs to a fund family whose assets under management are in the medium or bottom size tercile of all inhouse administered fund families within a year. Additional independent controls include: First stage residual, the residual from the first stage logit regression of the 2SRI estimation. Other independent variables and fixed effects are defined as in Table 3. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse incapable	-0.0402 *	-0.0566 ***	-0.0570 ***	-0.0432 **	-0.0401 *	-0.0586 ***	-0.0573 ***	-0.0435 **
	(0.0558)	(0.0069)	(0.0052)	(0.0146)	(0.0597)	(0.0060)	(0.0065)	(0.0158)
First stage residual	0.0293	0.0447 **	0.0474 **	0.0368 **	0.0297	0.0472 **	0.0482 **	0.0375 **
	(0.1749)	(0.0347)	(0.0232)	(0.0444)	(0.1761)	(0.0288)	(0.0255)	(0.0440)
Ln TNA family	0.0042 ***	0.0037 ***	0.0035 ***	0.0028 ***	0.0036 ***	0.0030 ***	0.0028 ***	0.0021 **
	(0.0002)	(0.0015)	(0.0012)	(0.0026)	(0.0010)	(0.0097)	(0.0088)	(0.0207)
Family focus	0.0110	0.0058	0.0045	0.0027	0.0118	0.0055	0.0048	0.0030
	(0.2012)	(0.5359)	(0.5763)	(0.7244)	(0.1746)	(0.5573)	(0.5528)	(0.6941)
Ln TNA	-0.0066 ***	-0.0063 ***	-0.0040 ***	-0.0016 *	-0.0077 ***	-0.0075 ***	-0.0051 ***	-0.0027 ***
	(0.0000)	(0.0000)	(0.0003)	(0.0986)	(0.0000)	(0.0000)	(0.0000)	(0.0031)
Ln age	0.0079 ***	0.0064 **	0.0042 *	-0.0016	0.0089 ***	0.0079 ***	0.0054 **	-0.0004
	(0.0018)	(0.0189)	(0.0763)	(0.4578)	(0.0003)	(0.0021)	(0.0169)	(0.8329)
Turnover ratio	-0.0017 *	-0.0002	-0.0007	-0.0006	-0.0016 *	-0.0002	-0.0006	-0.0005
	(0.0866)	(0.8117)	(0.3054)	(0.5598)	(0.0844)	(0.8448)	(0.3843)	(0.6101)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	12,282	12,282	12,282	12,282	12,282	12,282	12,282	12,282
Adj.-R^2	0.7350	0.0058	0.1567	0.0925	0.7372	0.0069	0.1590	0.0934

Table 10

Permutation test for the impact of funds' shareholder service outsourcing status on performance

This table presents results from a permutation test that investigates the impact of funds' service outsourcing status on mutual fund performance. In particular, the outsourcing status of shareholder services is randomly assigned to funds and the performance difference measured between service-outsourced funds and service-inhouse capable funds as well as service-inhouse incapable funds. This process is repeated 10,000 times to obtain p-values that represent the fraction of permutations that show an effect that is at least as strong as the performance difference observed in Table 5. The main independent variables in all permutations are the two binary variables, Service inhouse capable and Service inhouse incapable, which equal one if the service-inhouse fund, respectively, belongs to a fund family that is capable to administer its shareholder services internally or incapable and zero otherwise. I define a service-inhouse fund as capable (incapable) to administer its shareholder services internally if the fund belongs to a fund family whose assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families within a year. Other independent variables and fixed effects are defined as in Table 3 and not reported for brevity. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse capable	-0.0028	-0.0007	-0.0016	-0.0010	-0.0003	0.0022	0.0013	0.0019
	(0.1476)	(0.7651)	(0.4017)	(0.5762)	(0.8944)	(0.3321)	(0.4985)	(0.2590)
Service inhouse incapable	-0.0136 ***	-0.0146 ***	-0.0123 ***	-0.0078 ***	-0.0128 ***	-0.0139 ***	-0.0115 ***	-0.0070 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0007)
Fund and family controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	19,119	19,119	19,119	19,119	19,119	19,119	19,119	19,119
Permutations	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

Table 11
Mutual fund flows

This table presents results from pooled OLS regressions that analyze the impact of funds' service outsourcing status on fund flows. Fund flows are estimated as the fund's percentage growth rate adjusted for the internal growth of the fund as suggested by Sirri and Tufano (1998). The main independent variables are Service inhouse capable and Service inhouse incapable, which equal one if the service-inhouse fund, respectively, belongs to a fund family that is capable to administer its shareholder services internally or incapable and zero otherwise. I define a service-inhouse fund as capable (incapable) to administer its shareholder services internally if the fund belongs to a fund family whose assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families within a year. To account for the non-linear influence of fund performance on net-inflows I include PerfRank and PerfRank^2 representing the performance rank and squared performance rank of the fund in the previous year (Column 1 and 2). Alternatively, Column 3 reports results using a piecewise linear regression approach as in Sirri and Tufano (1998). Additional independent controls include Ln TNA family, Family focus, Ln TNA, Ln age, Turnover ratio, Expense ratio, Fund flow, Sigma fund flow, and Sigma fund return. Ln TNA family, is the logarithm of the fund family's assets under management (measured in millions of dollars). Family focus, represents the concentration of a fund family across investment objectives, defined as in Siggelkow (2003). Ln TNA, represents the logarithm of the fund's total net assets under management. Ln TNA family, Family focus, Ln TNA are all lagged by one year. Ln age, is the logarithm of the fund's age in years. Turnover ratio, is the fund's yearly turnover ratio. Expense ratio represents the fund's total expense ratio. Fund flow, is the net-inflow of the fund lagged by one year. Sigma fund flow, represents the standard deviation of the fund's monthly flows during the previous year. Sigma fund return, is the standard deviation of the fund's monthly net-of-fee returns during the previous year. Regressions are run with year and segment fixed effects. P-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Dependent variable: Fund flow in t			
Model:	1	2	3
Service inhouse capable	-0.1045	-0.1064	-0.1038
	(0.2042)	(0.1957)	(0.2077)
Service inhouse incapable	-0.0969 *	-0.0977 *	-0.1014 *
	(0.0860)	(0.0830)	(0.0735)
PerfRank	-1.1751 **	-1.2527 **	
	(0.0225)	(0.0190)	
PerfRank^2	2.0783 ***	2.1422 ***	
	(0.0009)	(0.0008)	
Bottom quintile			0.1827
			(0.5916)
Middle quintiles			0.3598 ***
			(0.0000)
Top quintile			5.5010 ***
			(0.0003)
Ln TNA family	0.1746 ***	0.1749 ***	0.1742 ***
	(0.0014)	(0.0014)	(0.0014)
Family focus	0.3516 ***	0.3473 ***	0.3469 ***
	(0.0004)	(0.0004)	(0.0004)
Ln TNA	-0.3145 ***	-0.3143 ***	-0.3157 ***
	(0.0004)	(0.0004)	(0.0004)
Ln age	-0.0397	-0.0407	-0.0362
	(0.4708)	(0.4596)	(0.5177)
Turnover ratio	0.0477 **	0.0490 **	0.0481 *
	(0.0492)	(0.0450)	(0.0549)
Expense ratio	-22.9077 **	-22.2262 **	-22.3398 **
	(0.0208)	(0.0266)	(0.0267)
Fund flow	0.0007 **	0.0008 *	0.0008 **
	(0.0437)	(0.0558)	(0.0358)
Sigma fund flow		-0.0013	-0.0012
		(0.2899)	(0.3109)

Table 11
Mutual fund flows (continued)

Dependent variable: Fund flow in t			
Model:	1	2	3
Sigma fund return		-0.4891	-0.6345
		(0.2545)	(0.1572)
Year fixed effects	Yes	Yes	Yes
Segment fixed effects	Yes	Yes	Yes
Number of Observations	18,000	17,977	17,977
Adj.-R^2	0.0275	0.0275	0.0289

Table 12

Service outsourcing and the impact for single- and team-managed funds

This table presents results from pooled OLS regressions that analyze the impact of funds' service outsourcing status on mutual fund performance. Results are reported for both subsamples of single- (Panel A) and team-managed (Panel B) funds. The main independent variables are Service inhouse capable and Service inhouse incapable, which equal one if the service-inhouse fund, respectively, belongs to a fund family that is capable to administer its shareholder services internally or incapable and zero otherwise. I define a service-inhouse fund as capable (incapable) to administer its shareholder services internally if the fund belongs to a fund family whose assets under management are in the top (medium and bottom) size tercile of all inhouse administered fund families within a year. Other independent variables and fixed effects are defined as in Table 3 and not reported for brevity. Robust standard errors reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Panel A: Single-managed funds

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse capable	-0.0002	0.0011	-0.0016	-0.0017	0.0025	0.0042	0.0018	0.0018
	(0.9763)	(0.8862)	(0.8220)	(0.7821)	(0.6978)	(0.5799)	(0.7970)	(0.7642)
Service inhouse incapable	-0.0157 ***	-0.0195 ***	-0.0154 ***	-0.0142 ***	-0.0152 ***	-0.0191 ***	-0.0150 ***	-0.0138 ***
	(0.0025)	(0.0006)	(0.0032)	(0.0036)	(0.0036)	(0.0008)	(0.0039)	(0.0046)
Fund and family controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	7,479	7,479	7,479	7,479	7,479	7,479	7,479	7,479
Adj.-R^2	0.6659	0.0055	0.1500	0.0917	0.6686	0.0057	0.1528	0.0922

Panel B: Team-managed funds

	Net-of-fee returns				Gross-of-fee returns			
Dependent variable:	Return	OAR	Jensen	Carhart	Return	OAR	Jensen	Carhart
Service inhouse capable	-0.0029	-0.0013	-0.0028	-0.0015	-0.0009	0.0008	-0.0008	0.0005
	(0.4547)	(0.7467)	(0.4213)	(0.6123)	(0.8224)	(0.8274)	(0.8060)	(0.8598)
Service inhouse incapable	-0.0121 ***	-0.0107 ***	-0.0105 ***	-0.0046	-0.0112 ***	-0.0097 ***	-0.0095 ***	-0.0037
	(0.0007)	(0.0022)	(0.0007)	(0.1332)	(0.0012)	(0.0044)	(0.0015)	(0.2053)
Fund and family controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Segment fixed effects	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Number of Observations	9,721	9,721	9,721	9,721	9,721	9,721	9,721	9,721
Adj.-R^2	0.7811	0.0059	0.1658	0.1192	0.7819	0.0063	0.1671	0.1200