The Mutual Fund Industry Worldwide: Explicit and Closet Indexing, Fees, and Performance*

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Abstract

Mutual fund investors face a basic choice between actively-managed funds and index funds with lower expenses. However, the prevalence of indexing is rare in most countries. Rather, actively managed funds in many countries engage in "closet indexing," choosing portfolios that closely match their declared benchmark. The degree of explicit indexing in a country is negatively related to fees, while "closet indexing" is positively associated with fees and negatively with performance. The most actively managed funds charge higher fees but outperform their benchmarks after expenses. The degree of indexing and the ability of active managers to outperform are both associated with competition and fees.

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JEL classification: G15, G18, G23

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Practitioners and academics have long debated the societal benefits of the active asset management industry as well as the degree of competition in the mutual fund industry. In terms of actively managed mutual funds, beginning with Sharpe (1966) and Jensen (1968), academic research has come down on both sides of the debate. Many studies question the value of active management, arguing that indexed portfolios are the better investment vehicle. For example, Gruber (1996) questions the rapid growth in actively managed mutual funds given empirical evidence that their average performance has been inferior to that of index funds.[2] French (2008) argues that U.S. investors spend an economically large amount in fees, expenses and trading costs in actively managed funds that try to beat market indices.

In contrast, other studies have provided empirical evidence that at least some mutual fund managers can add value through actively managed portfolios. For example, Cremers and Petajisto (2009) find that many actively managed U.S. equity mutual funds have holdings that are similar to those of their benchmarks, and argue that it is important to distinguish between funds that are truly active and funds that are "closet index funds," i.e., funds that hug their benchmarks. They also find that funds whose holdings are most different from their benchmarks (i.e., with the highest "Active Share") outperform, on average, their benchmarks net of expenses and trading costs.[3]

Given this multifaceted debate, we address the question of the existence and consequences of index versus active investing in the mutual fund industry around the world. Mutual funds have become one of the primary investment vehicles for households worldwide. As of June 2010, there exist over 68 thousand funds with over $21 trillion in assets under management. About

[2] See, for example, Carhart (1997) and Barras, Scalliet and Wermers (2010).
[3] See, also, for example, Grinblatt and Titman (1989, 1993), Bollen and Busse (2001, 2004), Avramov and Wermers (2006), Kosowski, Timmermann, Wermers, and White (2006), and Kacperczyk, Sialm, and Zheng (2008).

7,600 of these funds (with $10.5 trillion under management) are domiciled in the U.S.[4] Despite the fact that approximately 89% of the number of funds and over 50% of the assets are domiciled outside of the U.S., little is known about the structure of the asset management industry in other countries. The few papers analyzing mutual funds worldwide have so far studied the determinants of the size of the industry per country (Khorana, Servaes and Tufano (2005)) and the level of mutual fund fees (Khorana, Servaes and Tufano (2009)). These papers show substantial differences across countries in the development of the fund industry and link these to a combination of legal, regulatory and demand- and supply-side factors. However, research has not addressed how these factors are related to mutual fund investors' choice of active versus passive management worldwide, the extent to which active fund managers engage in "closet indexing" and, perhaps most interestingly, the ability of active managers worldwide to outperform their benchmarks.

We study the size of active and passive (both explicit and "closet index") mutual fund management around the world, employing a comprehensive sample of equity mutual funds and exchange traded funds over the period from 2002 to 2007. We first document the extent of explicit indexing across countries. In the U.S., explicit indexing comprises approximately 20% of assets under management. In other countries, explicit indexing is much less prevalent representing only 7% of assets under management; in some countries no explicitly indexed funds are offered at all.

Despite the infrequent use of explicit indexing outside the U.S., we find a relatively large amount of closet indexing in that a significant fraction of actively managed funds do not deviate considerably from their benchmarks. Using the Cremers and Petajisto (2009) Active Share

[4] Investment Company Institute Research and Statistics, Worldwide Mutual Fund Assets and Flows, October 2010, www.ici.org/research/stats/worldwide/ww_06_10

methodology, we find that 38% of non-U.S. actively managed funds have an Active Share of less than 60% as compared to 13% of U.S. actively managed funds.[5] Moreover, the relative levels of explicit and closet indexing vary not only across countries, but also across funds' investment strategies. Across most countries, country-level and sector-focused funds tend to have considerably higher degrees of closet indexing than global and regional equity funds.

The prevalence of passive and active management has implications for competition and performance in the mutual fund industry. Previous research has debated the degree of competition in the mutual fund industry and its consequences (e.g., Baumol (1989), Hortascu and Syverson (2004), and Coates and Hubbard (2007), Grinblatt, Ikaheimo, Keloharju (2008)). Instead of using a single country as the unit of observation, we use a worldwide sample of mutual funds to study the determinants of fees as do Khorana, Servaes and Tufano (2009). We go beyond their paper by examining the relation between the extent of passive versus active management and fund fees charged across countries.[6]

Our results show that the degree of passive management in the country where a fund is domiciled is related to the fees charged by the actively managed funds in that country. The existence of low-cost alternatives (index funds) thus seems a powerful force of competition to actively managed funds. In countries with more explicit indexation, active funds tend to charge lower fees and also have a weaker association between their level of active management and their fees. Actively managed funds have higher Active Shares in countries with more explicit indexing, which is consistent with explicit indexing providing competitive pressure and forcing actively managed funds to be more differentiated from index funds. Interestingly, the existence of closet indexing seems to reflect a lack of competitive pressure. In countries with more closet

[5] We discuss our choice of Active Share cutoff at 60% in Section II of the paper.
[6] Wurgler (2010) has argued that the growth of index-based investing and benchmarking interferes with fund managers' incentives to actively manage their funds and may distort asset prices.

indexing, active funds tend to charge higher fees. These results hold for measures of the degree of explicit and closet passive management at the domicile level and the domicile-benchmark-type level.

We examine whether investors in actively managed mutual funds worldwide benefit from active management. We find that both U.S. and non-U.S. funds that engage in more active portfolio management tend to charge higher fees but they outperform after fees, which is consistent with the finding in Cremers and Petajisto (2009) for U.S. mutual funds. We find that these results hold across different measures of fund performance. A one-standard deviation increase in Active Share is associated with an increase of 0.94% per year in future benchmark-adjusted returns and 0.50% per year in alpha. Thus, the degree of active management, as proxied by Active Share, predicts future fund performance across countries. Perhaps even more importantly, our worldwide sample of mutual funds allows us to study how performance by active funds is related to the country's competitive and regulatory environment. We find that less competition in a fund industry makes it easier to outperform for those fund managers who are willing to deviate more from their benchmarks.

Overall, our findings support the hypothesis that the degrees of explicit and closet indexation are important for understanding competition and fees in a country's mutual fund industry. However, the degrees of explicit and closet indexation play different roles. While the extent to which index funds and index-tracking ETFs are offered in a country seems associated with increased competition and lower fees for active funds, average fees increase with the extent to which active funds follow closet indexing strategies. We conclude that explicit indexation is indicative of improved levels of competition and efficiency of the fund industry in a country, while implicit or closet indexing indicates the reverse.

The remainder of the paper is organized as follows. In the next section, we describe our two primary data sources. Section II describes the prevalence of explicit and closet indexing across countries. Sections III and V provide empirical results on explicit and implicit passive fund management around the world and on the relation between fund fees, performance and competition. Section VI concludes.

I. Data and Variables

The data used in this study comes from two primary sources. The first is the Lipper Hindsight ("Lipper") database, which provides a comprehensive sample of open-end domestic and international equity mutual funds offered across the world. From this database we obtain individual fund characteristics, such as fund name, domicile, investment style, sponsor, monthly returns, total net assets and fees. The database is survivorship bias-free, as it includes data on both active and defunct funds. Although multiple share classes are listed as separate funds in Lipper, they have the same holdings, the same manager, and the same returns before expenses and loads. Thus, we keep the share class that Lipper identifies as the primary share class and aggregate the TNA across multiple share classes.

The second data source is FactSet/Lionshares ("Lionshares"), which provides portfolio holdings for institutional investors worldwide, including individual mutual funds and exchange-traded funds. This dataset has been used previously by Ferreira and Matos (2008), among others. We match the Lipper (fund characteristics and performance) and Lionshares (fund holdings) databases manually by fund name and by fund management company (see Appendix A for more details on the matching procedure).

In our analysis, we focus exclusively on open-end equity mutual funds and exchange-traded funds for which historical data is available across the 2002-2007 time period. The initial sample

drawn from Lipper consists of 28,174 primary open-end equity funds (both active and dead funds) with data on total net assets (TNA) and monthly total returns.

We identify funds' nationalities by their legal domicile, from which follows the relevant regulation and legal system. The funds in our sample are domiciled in 30 countries from several regions: North America (Canada, US), Europe (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, UK), Asia Pacific (Hong Kong, India, Indonesia, Korea, Japan, Malaysia, Singapore, Taiwan, Thailand) and two "offshore" locations (Dublin and Luxembourg). Mutual funds, while going by a variety of names around the globe, are fairly comparable investment vehicles world-wide (Khorana, Servaes and Tufano (2005)).[7]

For the large majority of funds (77%) in our sample the country of domicile is the same as the only country of sale. The major exceptions are the "offshore" locations (like Dublin and Luxembourg) where, as in Khorana, Servaes and Tufano (2005), we use the term "offshore" to describe financial centers which domicile fund complexes and sell funds in other countries.

Table I provides some key features of our sample by country as of December 2007. We focus on the major 20 European and North American countries. Due to a lack of holdings information data for many funds in the Asia-Pacific countries, those countries are combined into one observation in Table I. Column (1) of Table I shows that the 21,684 funds have aggregate TNA totaling over US$10.1 trillion across the 30 countries in our final sample. The assets of equity mutual funds domiciled in the U.S. represent the majority with total TNA of over US$5.9 trillion, but other markets are also important, namely Luxembourg (US$1.0 trillion) and the U.K. (US$0.6 trillion).

[7] The European Union, in an attempt to create a harmonized mutual fund industry, has adopted a common definition: UCITS (Undertakings for Collective Investment in Transferable Securities). In addition, the EU has adopted the "European passport" system (Directive 2001/107/EC) which facilitates cross-border marketing of UCITS.

We have checked the coverage of funds by Lipper with the aggregate statistics on mutual funds in 2007 from the European Fund and Asset Management Association (EFAMA) and Investment Company Institute (ICI) Factbook 2008th edition. The total numbers of equity funds reported by ICI is 26,950 as of December 2007, which corresponds to total net assets of equity funds (sum of all share classes) of $12.5 trillion. Thus, our sample of equity funds covers about 80% of the total net assets of equity funds worldwide.[8]

Column (2) of Table I shows that as of December 2007, we have detailed portfolio holdings from Lionshares for 10,145 funds with total TNA of over $ 7.9 trillion. Column (3) shows for each country the percentage of the funds' TNA from the Lipper database for which we have holdings data from the Lionshares database. In total, we have holdings information for about 79% of total net assets in Lipper, but as column (3) shows, coverage varies across countries. For the 20 countries in North America and Europe where we have good coverage of portfolio holdings information, the average is about 83% of the country's total net assets in the Lipper database. In contrast, we only have holdings information for funds averaging 20% of the TNA of funds domiciled in the 10 Asia-Pacific countries in our sample.

Lipper also provides the fund's declared investment type from the fund prospectus. Using these investment types, we divide funds into three categories: actively managed funds, exchange-traded funds, and index funds. Columns (4)-(6) of Table I report by country the number of funds in each of these categories along with their total net assets. There are a total of 9,221 active equity funds in our sample (2,500 in the U.S.), while the number of explicit passively managed funds is much smaller at 617 index funds and 307 ETFs (198 and 195, respectively, for the U.S.). Assets under management are a total of $1.3 trillion for indexed funds (index plus ETFs) and

[8] The ICI statistics are not entirely consistent across countries whether or not they include closed-end funds, while our sample excludes closed-end funds. Thus, our sample coverage of open-end equity funds is even higher than 81% of the total net assets of open-end equity funds worldwide.

$6.7 trillion for active funds. We can see that active funds still dominate the industry worldwide, although the popularity of indexed funds has been increasing in recent times.

Appendix B provides the list of the 77 specific benchmarks that funds track in our sample, which can be classified into four groups: world (funds that invest worldwide), regional (funds that invest in geographical region), country (funds that invest in a specific country), and sector (specific industry or style).

II. Explicit and Implicit Passive Fund Management Around the World

In this section, we examine how pervasive passive fund management is around the world. We first measure the amount of explicit passive fund management by using funds' self-categorization into actively or passively managed funds. We then examine the relative amount of implicit passive fund management (i.e., closet indexing) for the declared active funds, using the Cremers and Petajisto (2009) methodology. The analysis in this section and subsequent ones uses the sample of funds for which holdings data is available.

A. Explicit Indexing: The Relative Proportion of Index and Exchange-traded Funds

We first examine the extent of explicit passive management using the funds' declared investment type to group the funds into two categories: active (both active funds and funds of funds) and passive (index funds plus exchange-traded funds).

Column (7) of Table I shows that, overall, 16% of equity mutual fund assets under management worldwide are explicitly indexed as of 2007. The countries (or off-shore areas) with the highest levels of fund indexation are the U.S. (20%), Dublin (26%) and Switzerland (27%).[9] At the same time, we can see that passively managed funds are almost non-existent in several

[9] Dublin is known to be the "off-shore" area where most index funds are registered in Europe and funds can be sold in EU member countries.

countries such as Canada, Denmark, Ireland, Italy, the Netherlands, Poland and Portugal. We conclude there is substantial variation across countries in the degree to which indexed funds are offered to investors.

The measures of explicit indexing do not require holdings data. To investigate the possibility of selection bias from using the sample of 10,145 funds with holdings, we calculate the measures of explicit indexing using the initial sample of all 21,684 Lipper funds (including those without a match to the Lionshares holdings data). We find the degree by which funds are indexed is similar to the ones reported above: 16% of equity fund assets under management worldwide are explicitly indexed, and 22% in the case of U.S. funds.

Columns (2), (5), (8) and (11) show the frequency of explicit indexing according to funds' benchmark types. We see that frequency of explicit indexing is highest for funds focused on their domestic country or sector funds where 19% of the funds are indexed. Indexed funds are also common among regionally-focused funds (18%) and country or sector funds invested in a foreign market relative to the domicile of the fund (15%), but they quite infrequent among global funds (3%).

B. Implicit or Closet Indexing

We have shown that explicit indexing is uncommon with the exception of a few countries in our sample. However, many active mutual fund managers may practice a form of "closet indexing," in the sense that their fund holdings are quite similar to the holdings of their benchmark index, while still marketing themselves and charging fees similar to active funds. Here, "active" investing is defined as choosing a portfolio that is different from the benchmark. Closet indexing is problematic for investors in the fund, who are paying fees for active

management. If fund holdings overlap with the index holdings, investors are effectively earning index-like returns, which could have been obtained for generally substantially lower fees through index funds or index-tracking ETFs.

To measure the relative amount of implicit or closet indexing in a country, we measure the level of effective active management by active funds domiciled in that country as given by its "Active Share." This measure was developed by Cremers and Petajisto (2009) using a fund's portfolio holdings. The Active Share of a fund represents the share of portfolio holdings that differs from the (declared) benchmark index holdings, which is calculated as

$$Active\ Share = \frac{1}{2}\sum_{i=1}^{N}\left|w_{fund,i} - w_{benchmark,i}\right|$$

where $w_{fund,i}$ and $w_{benchmark,i}$ are the portfolio weights of asset i in the fund and in the benchmark index, respectively, and the sum is taken over the universe of all assets in either the fund's portfolio or the fund's benchmark. For a mutual fund that never shorts a stock and never buys on margin, its Active Share will always lie between zero and 100%.

We adjust the methodology of Cremers and Petajisto (2009) due to our international setting. The first adjustment is due to the fact that internationally funds may hold different securities in the same company (e.g., common shares, ADRs and other non-U.S. dual listings), which constitute fundamentally the same ownership stake of a company, but via securities listed in different markets. We sum these holdings in the same company as part of the same portfolio position.[10] The second adjustment arises because we do not have access to official index weights for the many benchmark indices across markets. Consequently, we construct the index weights for 77 benchmark indices ourselves using one of two approaches. We use the aggregate portfolio

[10] We manually compiled the list of ADRs and dual listings based on Ferreira and Matos (2008).

of the explicitly passive funds tracking an index, in the cases in which we have detailed portfolio holdings for at least five passive funds tracking that particular index. If we do not have that information for a given index, we use the aggregate portfolio of all active (i.e., not explicitly passive) funds that track a given index.[11]

Columns (8)-(11) of Table I provide the distribution of the Active Share measure for the set of actively managed funds domiciled in each country. Note that these calculations exclude explicit index funds and ETFs and are only conducted for the subset of actively managed funds as determined by each fund's declared type. We use an Active Share below 60% as the cutoff for an actively managed fund to be labeled as a closet indexer.[12]

Column (10) of Table I shows a wide range of closet indexing across countries, ranging from 13% to 81%. While only 13% of active funds domiciled in the U.S. would be considered closet indexers, this percentage is much higher in almost all other countries. Several countries have such low Active Shares that according to the 60% threshold, the majority of funds would be considered closet indexers, namely Belgium, France, Italy, Poland, Sweden and Switzerland.

Figure 1 compares the prevalence of explicit versus closet indexing across countries in 2007. Countries are sorted, in descending order, by the sum of both explicit and closet indexing as a percentage of the total net assets of funds domiciled in each country. Explicit indexing is the percentage of TNA that passive funds represent of all funds domiciled in each country (see

[11] We performed several checks on using the first approach versus the second approach. For example, for the major benchmark indices where there are many index funds (MSCI World, Dow Jones Euro Stoxx 50, S&P500) there are no significant differences on the average active shares of active funds if one adopts the measure from either approach.

[12] We use an Active Share below 60% as the cutoff of an actively managed fund to be labeled as closet indexing (an Active Share of 60% means that 40% of the fund portfolio weights overlap with the benchmark index weights).The 60% cutoff is somewhat arbitrary, but as, on average, half the holdings in any portfolio will beat the portfolio's average return, then an active fund (with a manager who tries to beat the benchmark) should have an Active Share equal to at least 50%. As 50% is thus the absolute minimum level of Active Share that is still consistent with active management, we then use a cutoff that is slightly higher, at 60%

column (7) of Table I); closet indexing is the percentage of TNA that active funds with Active Shares below 60% represent, and the "truly" active funds constitute the remainder.[13]

The U.S. has one of the highest levels of explicit index management (with 20% of fund assets managed by index funds and ETFs) and also has the lowest level of closet indexing among all countries in our sample (at 10%) as its actively managed funds are effectively quite "active." In contrast, for many countries with little to no explicit indexation, the actively managed funds domiciled in these countries are relatively passive, as measured by their Active Shares. For example, Canada, with one of the largest fund industries in the world with $435 billion in equity mutual fund as of December 2007, has a low level of explicit indexation (at 2%) but a larger level of closet indexing (at 40%). Moreover, Poland has no index funds, but over 81% of its assets are in active funds have holdings that are highly similar to their respective benchmarks.

An alternative measure to "Active Share" that also tries to capture the level of active fund management is the "R-squared" measure introduced by Amihud and Goyenko (2009), which is defined as the R-squared from a regression of fund returns on benchmark index returns. In general, more active funds whose holdings deviate more from their benchmark are expected to have a lower R-squared. We calculate this measure for each fund as the R-squared of the rolling 36-months of a fund's monthly returns on the benchmark index returns. One advantage of the R-squared measure, as pointed out by Amihud and Goyenko (2009), is that it does not require portfolio holdings information. Column (12) of Table I shows the median R-squared per country. Comparing this measure to the Active Share measure in Column (10), there is not as great a difference in active management between U.S. mutual funds and those from other countries. We

[13] These figures are different from those in column (10) of Table 1, as they are now calculated as a percentage of total TNA instead of total TNA only for active funds as was done in column (10) of Table 1.

conclude that holdings information is important to pin down the degree of closet indexing, as R-squared does not give as clear a picture.

C. Benchmark Types

Active Share depends on the type of strategy a fund's managers choose to pursue and the type of benchmark associated with the fund. Table II provides an overview of the total net assets as well as the relative levels of explicit and closet indexing in the different benchmark types (world, regional, country or sector funds) across the top 20 countries in our sample. Column (7) of the table shows that the majority of equity funds invest domestically, i.e., in the same market where the fund is domiciled (4,136 funds, $4.5 trillion). The next most prevalent type of fund invests regionally (2,434 funds, $1.5 trillion), followed by world funds (1,506 funds, $1.4 trillion) and other specific "foreign" country or sector (2,069 funds, $630 billion). The table shows that the breakdown of funds by benchmark type varies across countries. Domestic funds are predominant in the U.S, but in many European countries world and regional funds are relatively more important. The extreme cases are, for "offshore" "countries": Luxembourg, Ireland and Dublin. Ireland ("onshore") and Dublin ("offshore") are of course in the same country but constitute two separate fund markets.

Table II also shows that levels of indexing vary not only across countries (as previously shown in Table I and Figure 1), but also across these investment types. For example, columns (3) and (4) show that both explicit and closet indexing are rare for funds pursuing global investment strategies, but columns (8) and (9) show that these types of indexing are more common for country or sector indices. The comparative differences across countries reported in Table I and illustrated in Figure 1 continue to hold even after controlling for benchmark type. For example, for country and regionally focused funds, more U.S. domiciled funds are explicitly indexed but

then the active funds are actually more "active" (i.e. have lower Active Shares) than funds domiciled in other countries.

Figure 2 shows the levels of explicit and closet indexing by benchmark type. Looking horizontally across each country row, the graphs provide a perspective on how indexing varies across benchmark types within a country and looking vertically provides a perspective on how indexing within a benchmark type varies across different countries.

The varied benchmark types (world, regional, country or sector) and the diversity in the universe of stocks in each of these types have implications for the measurement of Active Share in our international sample. For example, the index funds in our sample tracking the MSCI World index (the most popular world index) typically contain positions in over 1,300 stocks, whereas the index funds tracking the Dow Jones Stoxx 50 index (the most popular regional index for Europe) typically contain positions in over 40 stocks and the ones tracking the S&P500 index (the most popular country index) typically contain 160 stocks. Thus, the scope for being "active" versus the benchmark index weights depends in part on the number of stock positions one needs to use to replicate the benchmark. For example, we find that the average Active Share in December 2007 is 81% for active funds tracking the MSCI World index and 65% for funds tracking the Dow Jones Stoxx 50 index. However, the number of stocks in the benchmark is only one dimension that is related to Active Share, and we will consider how various other fund, benchmark and country characteristics are related to the level of Active Share in Section III.

III. Competition, Fees and Active Management

The degree of competition in the mutual fund industry has been widely debated with some studies arguing that the industry has extensive competition and other studies claiming the industry lacks competition (e.g., Baumol (1989), Hortascu and Syverson (2004), Coates and

Hubbard (2007), Grinblatt, Ikaheimo, and Keloharju (2008)). The key measure of competition in these studies is the level of fees charged to investors. Given that fees charged on passive management are typically the low-cost alternative to active funds, the hypothesis of a competitive market implies a relation between the level of passive management and the fees charged across countries.

We measure mutual fund fees using Lipper data on the total expense ratio (TER), management fees and front-end load fees. Similar to Khorana, Servaes and Tufano (2009), we calculate the average total fees experienced by a typical investor, which we label as "total shareholder cost" (TSC), as TSC = TER + front-end load/5. If information on TER is missing, we use management fees instead. The total shareholder cost calculation assumes that the typical investor holds a fund for five years, and that rear-end loads are waived if the fund is held for that length of time. Because our data only provides information on management fees prevailing as of 2007 (the end of our sample period), our analysis is a single cross-section. However, we obtain consistent findings using only TERs (which can vary by year but are available only for a subset of funds) across the full-sample period.

Table III provides descriptive statistics on the level of fund fees per country, using TNA-weighted average fees per country. Fund fees vary considerably across countries. Irrespective of whether one looks only at total expense ratio, management fees or the total shareholder cost, the average fund fees in the U.S. are the lowest across all countries in the sample. For those countries for which we use the management fee in the total shareholder cost because information on TER is missing in the Lipper database, the total shareholder cost can be considered to be a minimum bound.

Columns (4)-(6) of Table III separate the average fees for the actively versus passively managed funds in each country. As expected, index funds and ETFs exhibit the lowest fees but, again, the U.S. stands out for having some of the lowest cost funds of either category. Columns (7)-(10) provide average fund fees across the different benchmark types (world, regional and country sector). The table indicates that the differences across countries are generally larger than the differences within countries across benchmark types.

A. Relation between Fees and Indexing

In this section, we test the hypothesis that fee competition in a country is associated with the level of indexing. If indexing is related to competition in a market, we would not expect the two measures of indexing to have the same relation with fees. The existence of explicit indexing represents a low cost alternative choice for investors. In contrast, closet indexing could represent less choice for investors across active funds.

The top panel in Figure 3 illustrates the relation between the average total shareholder costs of actively managed mutual funds in a country and the percentage that explicit fund indexing represents of all assets under fund management in the country. The panel shows a modest negative relation between average fees for active funds and the level of explicit indexing. The bottom panel in Figure 3 illustrates the relation between average shareholder costs and the percentage that closet indexing, defined as actively managed funds with Active Share below 0.6, represents of the total assets of actively managed funds in each country. The bottom panel shows a different relation with the total shareholder costs for active management, as it shows a positive relation between average fees for active funds and closet indexing.

We next test our hypotheses of a relation between fees and indexing using multivariate tests with fund-level data. Specifically, we examine whether an active fund's total shareholder costs

are correlated with the level of explicit and closet indexing in the country in which the fund operates. This allows us to measure the level of explicit and closet passive management both at the domicile level (as in Table I) or domicile and benchmark type level (as in Table II).[14] In these regressions, we control for fund-level active management (Active Share) as well as fund size (log of TNA), age, flows and type (domestic or foreign-focused). We also include dummies for geographical focus and cluster standard errors by geographical focus to correct for correlation within each geographical focus group. In an alternative analysis we use domicile country dummies. We also obtain consistent findings if we include benchmark dummies or cluster the standard errors by benchmark. Table IV provides the results of this analysis.

Columns (1) and (2) of Table IV provide the coefficients from the regression of fund fees on Active Share before adding any proxies for the level of indexing in a country. For both specifications we find that more active portfolio management by a fund is associated with higher fees. Fund size, age, investment strategy (domestic versus international) and flows are also related to fund fees. Larger funds, younger funds and funds with a domestic focus charge investors lower fees. Funds with larger net flows seem to charge higher fees, which could be a response to stronger demand for certain types of funds.

In columns (3) and (4) of Table IV, we estimate fund fee regressions separately for the samples of non-U.S. and U.S. domiciled funds. The relation between fees and active share is positive and significant in both samples, but is stronger in the U.S. The difference is economically significant: a one-standard deviation increase in Active Share (i.e., 22%) is associated with an increase in fees of 15 basis points for non-U.S. funds and 22 basis points for U.S. funds.

[14] Again, since our data only provides information on management fees prevailing as of 2007 (the end of our sample period), we limit our analysis to the funds available in the year 2007.

In columns (5)-(8) of Table IV, we add proxies for the level of explicit and implicit indexing in a country. Column (5) shows that fund fees tend to be lower in markets where more funds are explicitly indexed. This suggests that investors of active funds pay lower costs when there are more low-cost index fund alternatives in the market. In contrast, column (6) shows that fund fees are higher in markets with more closet indexing. These results hold when we include both country-level variables in the same regression. Moreover, this effect goes beyond fund-level active management, as we still find that fund-level Active Share remains significantly positively related with fees.

Columns (8)-(10) present similar regressions using measures of explicit and implicit indexing but now measured at a country and type of benchmark level (ex: regional funds domiciled in the U.S.). These results are consistent for the measure of explicit indexing but insignificant when we use a measure of closet indexing by country/type. Columns (11) and (12) report results of regressions that combine measures of indexing in a country and country/type as well as fund-level Active Share. The results confirm a positive and significant relation between fund- and country-level explicit and implicit active management and fund fees. Some results are weaker for country/type measures of closet indexing consistent with the idea that, at least for fund fees, competition operates at the country-level, rather than at the level of benchmark type in each country.

C. Relation between Active Share and Explicit Indexing

One important question is whether the choice of active fund management by individual mutual fund managers is related to the overall level of explicit indexing in a given country. To the extent that actively managed funds vary more from their benchmarks, investors face a more differentiated basic choice of active versus passive management. In the previous section, we

found that the level of explicit indexing is negatively associated with fees while closet indexing is positively associated with fees, where we interpret lower fees as suggesting stronger competition. In this section we examine whether the same market forces captured in the level of explicit indexing are related to the extent to which actively managed funds are different from their benchmarks.

To conduct this test, we use the Cremers and Petajisto (2009) Active Share as the dependent variable. The base specification controls for R-squared (from a regression of fund return on fund benchmark return) and other fund factors. Since we have fund holdings for all years in our sample, we conduct the analysis with all fund-years for active funds from 2002 to 2007. We also include dummies for year and geographical focus and cluster standard errors by geographical focus to correct for correlation within each geographical focus group, and show all results with and without controlling for the level of closet indexing.

Table V shows the results. Columns (1)-(3) show that funds tend to exhibit more active management (higher Active Share) in markets where there is more explicit indexation, even when controlling for the level of closet indexing. Interestingly, however, funds exhibit lower Active Share in markets with more closet indexing- Columns (5)-(7) show this same relation is true when we look at the prevalence of indexation as measured at the domicile and benchmark type level. Finally, in column (7) we see that the relation between Active Share and the degree of explicit and implicit indexing is stronger for the country/type measures than for the country measures. This is consistent with the different fund types being in distinct markets, each subject to different market forces. In conclusion, our results suggest that stronger competition is associated with more explicit indexing and actively managed funds that are more differentiated

from their benchmarks. Given the basic choice for investors between active and passive management, this choice thus seems more pronounced in more competitive markets.

IV. Returns to Active Management

In this section, we examine whether investors in active mutual funds benefit from active management, net of all expenses and trading costs. We analyze whether there are returns to active management across our sample of countries in a similar fashion to the Cremers and Petajisto (2009) analysis for U.S. equity mutual funds. Those authors show that their measure of Active Share predicts fund performance in the U.S.: funds with the highest Active Share significantly outperform their benchmarks in the subsequent period, both before and after expenses and both with and without risk-adjusting. In contrast, actively managed funds with the lowest Active Share underperform their benchmarks after expenses. Cremers and Petajisto (2009) also find that funds with higher Active Share exhibit strong performance persistence.

We first examine, for each country, the percentage of fund-year observations with positive abnormal performance. Using the sample of funds with holdings data, we calculate benchmark-adjusted returns as the difference between a fund's return and the return on its benchmark. We also estimate four-factor benchmark-adjusted alphas using three years of past monthly fund benchmark-adjusted returns in U.S. dollars with regional factors (Asia, Europe and North America) or world factors in the case of global funds in the manner of Bekaert, Hodrick and Zhang (2009).[15] We then subtract the expected return from the realized fund return to estimate the fund abnormal return in each quarter, or alpha, which is measured as a sum of an intercept of the model and the residual as in Carhart (1997).[16]

[15] See Ferreira, Miguel and Ramos (2010) for details about the construction of the factors.

[16] We obtain similar findings using variations to this approach such as using excess returns instead of benchmark-adjusted returns and using local (domicile country) factors instead of regional factors for domestic funds.

The results in Table VI show that across the world, on average, mutual funds underperform relative to their respective benchmarks. Panel A shows that, overall, only in 46.7% of fund-years do active equity funds have positive benchmark-adjusted returns (after fees). The figure is even lower if we consider four-factor benchmark-adjusted returns as a measure of performance: only 36.2% of the funds have positive alphas in a given year (with substantial variation across countries and fund type).

Panel B of Table VI analyses how these "batting averages" change for more or less active funds. We find that the average odds of funds beating their benchmark in a particular year tends to go up with a fund's level of Active Share for both benchmark-adjusted net returns and four-factor benchmark-adjusted alphas. Panel C shows a similar picture, namely that average performance is higher for more actively managed funds. These univariate patterns apply to all fund types, with the exception of domestic-focused country funds, where results are mixed in both Panels B and C.

In Table VII we regress annual fund performance on measures of active fund management (Active Share and R-squared) as well as fund controls, where all are measured with a one-year lag. To assess mutual fund performance, we use several risk-adjusted performance measures. Panel A uses benchmark-adjusted returns defined as fund returns net of benchmark index returns. Panel B uses four factor alphas of the benchmark-adjusted returns in which the asset pricing model depends on the benchmark type of the fund – four regional factors for regional, country and sector funds but four world factors in the case of global funds. Finally, Panel C uses the "information ratio" defined as the 4-factor alpha divided by the sum of squared errors. Regressions include benchmark and year dummies and standard errors are clustered by fund to

correct for correlation within a fund. Funds in "offshore" areas like Luxembourg and Dublin are excluded from the analysis in Table VII.

Column (1) of Table VII shows that funds with higher Active Share tend to perform better than their benchmark in the subsequent year (Panel A), which is robust to using the four-factor alpha (Panel B) or the information ratio (Panel C). Thus Active Share can be used as a predictor of future fund performance. The effect of Active Share on fund performance is economically significant. A one-standard deviation increase in Active Share in a given year is associated with a 0.94% per year increase in benchmark-adjusted returns and 0.50% per year increase in alpha in the subsequent year.

As an alternative to Active Share, we use the R-squared measure proposed by Amihud and Goyenko (2009). A lower R-squared means that returns deviate more from the returns of the benchmark index that a fund tracks, which is defined as more active management. R-squared is calculated as the R-squared of a regression of the fund return on its benchmark return using the past 36 months. Following Amihud and Goyenko (2009), we use a logistic transformation of R-squared, log[sqrt(R-squared)/(1-sqrt(R-squared))]. This measure has the advantage that it does not require information on fund holdings as it is just based on fund returns.

We use the R-squared measure in column (2) of Table VII and find that funds with lower R-squared (more active management) again tend to exhibit better future performance in benchmark-adjusted (Panel A) and information ratio terms (Panel C), but not in terms of four-factor alphas (Panel B). As we have mentioned, we can use more fund-year observations for this specification than column (1) with Active Share that requires information on fund portfolio holdings.

In column (3) of Table VII, we use both the Active Share and R-square measures. In general, the Active Share measure seems more robustly associated with future performance, as it remains significant using benchmark-adjusted returns (Panel A) and its four-factor alphas (Panel B), whereas R-squared becomes insignificant in those specifications. However, using the information ratio in Panel C, both Active Share and R-squared are significant.

In columns (4)-(5) of Table VII we split funds domiciled in the U.S. from funds domiciled in other countries. In both subsamples, we find that more active funds are more likely to outperform their benchmarks, using all three performance evaluation measures. The effect of Active Share in future fund performance is generally strongest for funds domiciled in the U.S., while R-squared is especially robust for funds domiciled outside the US.

V. Fees and Performance Considering Country Characteristics

In this section, we examine how the previously documented positive association between active management and both fund fees and future performance is related to various country characteristics. We consider several country characteristics as explanatory variables: the degree of explicit and closet indexing and fund industry competition, legal and regulatory variables of the fund industry, and a measure of the financial sophistication of the typical investor in a country.

As discussed earlier, differences in fund industry competition and regulatory environments across countries would imply differences in fees. We first consider potential barriers to entry in the fund industry. To measure the difficulty of setting up a new fund, we use "Setup Time" and "Setup Costs" from Khorana, Servaes, and Tufano (2005).[17] If regulatory requirements make it

[17] We thank Henri Servaes and his co-authors for making this data available to us.

more difficult to set up a new fund, either in terms of time or costs, this may reflect barriers to entry and limit competition in the industry.

Using data from Finland, Grinblatt, Ikaheimo, and Keloharju (2008) find that an individual's IQ score is related to the choice of the fund distribution channel but not to fund fees. A related measure is in the variable "Financial Sophistication," which reflects the views of a survey of executives and managers regarding the sophistication of the financial markets in the country.[18]

If foreign mutual funds have a significant market share in a country, the competition would be expected to be greater. Thus, we use "Fund Industry Foreign Share," which measures the percentage of the total mutual fund industry in each country that is owned by foreign entities (according to our database).

We also use a more direct measure of the competition in an industry by calculating "Fund Industry Herfindahl" as the Herfindahl index of market share given all equity mutual funds in each country sample, where country is calculated by country of domicile. A lower Fund Industry Herfindahl would be associated with a greater level of competition in the fund industry.

Next, we consider the level of indexation in each country fund industry. "Explicit Indexing" measures the percentage of all assets under management in our sample in each country (or by investment type within each country, i.e., separately for global, regional, country or sector funds) that is invested in explicitly index funds or ETFs. "Closet Indexing" measures the percentage of all assets under management in each country (or by investment type within each country) that is actively managed but has an Active Share below 0.6.

In Table VIII, we regress the total shareholder costs of funds at the end of 2007 on Active Share, domicile country characteristics described above, and their interactions with Active Share.

[18] The particular question used for 'Financial sophistication' asks a group of executives and managers surveyed in the Global Competiveness Report (GCR) if "The level of sophistication of financial markets is higher than international norms." We obtain this variable from Griffin, Hirschey, and Kelly (2009).

Our main interest is in the coefficient of the interaction of Active Share with the country-level variables. In columns (1) and (2), the interactions between Active Share and the time or costs associated with setting up a new fund are insignificant. In column (3), we find that funds in countries where investors may be more financially sophisticated pay lower fees. Further, the interaction of Active Share with Financial Sophistication is positive and strongly statistically significant. This suggests that if the investor understands financial product better, they are more willing to pay for active management.

We also find that greater competition as measured by Fund Industry Foreign Share is associated with lower costs, but its interaction with Active Share is insignificant. In contrast, while the Fund Industry Herfindahl by itself is insignificant, its interaction with Active Share is negative and significant. As a larger Herfindahl can be interpreted as weaker competition, this means Active Share is less strongly associated with total shareholder costs in countries with less competition. Therefore, with less competition, active funds that practice closet indexing may get away with charging more similar fees to truly active funds. One possible reason is that with less competition, the general information environment is weaker. Finally, we find that the level of explicit indexing is not associated with the costs of investing in actively managed funds, nor its interaction with Active Share. However, countries with more closet indexing have higher costs, suggesting that in those countries, investors pay more for less active management. As a result, the level of closet indexing seems a reasonably proxy for competition in the industry by itself. The interaction of Active Share with the level of closet indexing is insignificant.

Table IX presents results of performance regressions on Active Share, the country-level variables described above and their interactions with Active Share. We measure performance using the four-factor alphas. All right-hand-side variables are lagged by one year, such that the

regressions can be interpreted as predicting future fund outperformance of their benchmark, adjusted for exposure to the regional and world market factors, size, book-to-market and momentum factors.

The first main finding from Table IX is on the interaction between different proxies for the level of competition in the fund industry across countries. We posit two competing hypotheses. First, with weaker competition, it may be easier to find opportunities to outperform, just because few other fund managers are trying to do so (i.e., markets are less efficient). This would predict that the positive relation between Active Share and future fund outperformance is stronger in less competitive markets. The alternative hypothesis is that with more competition, each fund is trying harder to outperform and is more efficiently organized to make this possible. (In this alternative case, stronger competition within the fund sector may or may not affect the overall efficiency of the stock market.) Potentially, if countries with stronger competition have more efficient or transparent stock markets, it may be easier for fund managers (or their companies) to figure out whether they have skill. If so, this may mean that in equilibrium only the more skilled managers will end up with greater Active Share. As a result, the alternative hypothesis would predict that the positive association between Active Share and future fund performance would be stronger in countries with stronger competition.

Empirically, we find that the positive association between Active Share and future fund performance is weaker in countries with stronger competition in the fund industry as proxied by lower Setup Costs and higher Fund Industry Foreign Share (controlling for total shareholder costs, which are of course also directly related to competition). The interaction of Active Share with Setup Costs is positive and statistically significant, while its interaction with Fund Industry Foreign Share is negative and significant. These results suggest that less competition makes it

easier to outperform for those fund managers who are willing to deviate more from their benchmarks.

Finally, we consider the interactions of Active Share with the levels of explicit and implicit (or closet) indexing. Both interactions (measured at the country-level or country-fund-type-level) have a negative and statistically significant coefficient. Therefore, we find that if more funds pursue indexed strategies, Active Share is less strongly related to future outperformance. Our interpretation is that, in equilibrium, in competitive markets Active Share matters less for future performance and index investing is an attractive alternative. This result could also be endogenous as it is hard to beat the market in these domiciles, and therefore more funds and investors pursue index investing. However, the weaker association between Active Share and fund performance in countries with more indexing goes against the notion that significant indexing leaves markets less efficiently priced allowing active management to profit from that inefficiency.

VI. Conclusion

We examine the prevalence of explicit and implicit (closet) indexing in equity mutual fund management across 30 countries. We find that although little explicit indexing exists as a proportion of assets under management in most countries, there is a large degree of closet indexing. That is, equity fund managers in many countries choose portfolios that track their declared benchmark closely. A first implication of these findings is that for those "closet index" funds, their shareholders may be paying for active management when in fact they are receiving largely passive management. As in order to beat a benchmark, it is necessary to be different from the benchmark, a second implication is that such that closet indexing is unlikely to lead to outperformance.

We examine these implications and find that the costs to mutual fund investors are related to the degree of explicit and closet indexing, suggesting that the degree of indexing in a country affects the overall competitive environment in the fund industry. Fees are negatively associated with the level of explicit indexing, suggesting that having low-cost mutual fund options may increase competition and drag down prices. In contrast, fees are positively related with the level of closet indexing. That is, the less active management practiced by funds, the lower the competition and the higher the fees. Our results suggest that fund fees depend not only on the regulatory environment of a country, but also on the level of indexing in a country, both explicit and implicit.

We also examine fund performance and its relation with implicit and explicit indexing. We find that the while the more active mutual funds earn returns in excess of their benchmark, the closet indexers do not. Further, we find that the amount of active management is related to the competitive environment of the industry. We find that less competition makes it easier to outperform for those fund managers who are willing to deviate more from their benchmarks.

Overall, our results suggest that many investors world-wide face a limited opportunity set in their mutual fund investments. In many countries, investors are not given the option of paying lower fees for explicit passive management, but instead they pay higher fees and receive implicit passive management rather than receiving the benefits (and higher returns) from truly active management.

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Table I
Sample of Equity Mutual Funds by Country

This table presents the number of funds and total net assets (TNA) of the sample open-end equity mutual funds per domicile country, taken from Lipper as of December 2007. Column (1) presents statistics for all funds. All other columns present statistics for the final sample of funds for which portfolio holdings are also available in Lionshares. The sample includes active funds and passive (exchange-traded and index) funds. In column (6), "TNA Coverage" is the percentage of TNA that funds in our sample represent out of the Lipper universe in each country. In column (7), "Explicit Indexing" is the percentage of TNA that passive funds represent of the total TNA. In columns (8)-(11), "Closet Indexing" is the percentage of TNA that active funds with Active Share (AS) measure below 0.2, 0.4, 0.6 or 0.8 represent of the total TNA of active funds in each country. In column (12), "R-squared" is the country median R-square obtained from the regression of individual fund returns on benchmark returns.

				TNA		Exchange		Explicit	Closet Indexing (%)				
Domicile		All Funds	Funds with Holdings	Coverage (%)	Active Funds	Traded Funds	Index Funds	Indexing (%)	AS<0.2	AS<0.4	AS<0.6	AS<0.8	R^2
Country		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Austria	Nr. funds	320	152		138	0	14						
	TNA ($bil)	29.0	19.0	66	17.8	0.0	1.2	6	0	23	43	74	82
Belgium	Nr. funds	236	159		141	0	18						
	TNA ($bil)	34.9	27.5	79	25.7	0.0	1.8	7	5	32	52	82	90
Canada	Nr. funds	1,955	685		661	0	24						
	TNA ($bil)	434.5	295.2	68	290.4	0.0	4.8	2	0	6	40	62	88
Denmark	Nr. funds	234	184		181	0	3						
	TNA ($bil)	41.3	37.2	90	36.4	0.0	0.8	2	5	18	32	56	88
Dublin	Nr. funds	620	346		305	29	12						
	TNA ($bil)	224.0	157.5	70	117.0	25.0	15.5	26	7	12	38	72	88
Finland	Nr. funds	223	126		118	0	8						
	TNA ($bil)	29.7	19.9	67	19.0	0.0	0.9	5	0	13	38	70	80
France	Nr. funds	1,631	597		512	27	58						
	TNA ($bil)	361.7	214.8	59	184.5	16.5	13.8	14	8	34	63	79	87
Germany	Nr. funds	573	401		364	23	14						
	TNA ($bil)	188.5	171.9	91	152.2	16.3	3.4	11	1	22	37	59	85
Ireland	Nr. funds	104	38		37	0	1						
	TNA ($bil)	28.9	13.7	47	13.5	0.0	0.2	1	0	4	26	56	83
Italy	Nr. funds	324	252		249	0	3						
	TNA ($bil)	80.2	72.8	91	72.7	0.0	0.1	0	0	24	62	88	92
Luxembourg	Nr. funds	2,622	1,697		1,620	14	63						
	TNA ($bil)	1,007.3	779.5	77	759.4	5.2	14.9	3	1	7	26	69	87
Netherlands	Nr. funds	181	68		66	0	2						
	TNA ($bil)	68.6	33.2	48	32.8	0.0	0.4	1	0	6	11	45	86
Norway	Nr. funds	192	120		111	2	7						
	TNA ($bil)	38.7	31.8	82	28.8	0.1	2.9	9	0	11	22	42	89
Poland	Nr. funds	51	34		34	0	0						
	TNA ($bil)	15.1	12.5	83	12.5	0.0	0.0	0	0	34	81	99	95
Portugal	Nr. funds	64	52		51	0	1						
	TNA ($bil)	5.1	4.4	86	4.4	0.0	0.0	0	26	38	41	78	89
Spain	Nr. funds	553	353		320	3	30						
	TNA ($bil)	43.3	34.2	79	31.2	0.7	2.3	9	1	30	49	81	92
Sweden	Nr. funds	290	233		213	4	16						
	TNA ($bil)	120.6	103.6	86	96.9	2.6	4.1	6	10	32	53	85	92
Switzerland	Nr. funds	337	169		152	2	15						
	TNA ($bil)	84.5	47.4	56	34.7	2.9	9.8	27	37	51	63	84	94
UK	Nr. funds	1,302	706		667	0	39						
	TNA ($bil)	648.4	466.2	72	428.9	0.0	37.3	8	1	7	41	78	86
Asia Pacific	Nr. funds	5,967	880		781	5	94						
	TNA ($bil)	672.8	134.1	20	120.0	8.8	5.3	11	0	6	35	70	87
Total (Non-USA)	Nr. funds	17,779	7,252		6,721	109	422						
	TNA ($bil)	4,157.3	2,676.7	64	2,479.0	78.2	119.5	9	3	13	38	71	88
USA	Nr. funds	3,905	2,893		2,500	198	195						
	TNA ($bil)	5,982.2	5,295.6	89	4,224.1	463.1	608.4	20	0	1	13	47	87
Total	Nr. funds	21,684	10,145		9,221	307	617						
	TNA ($bil)	10,139.5	7,972.3	79	6,703.1	541.3	727.9	16	1	5	22	56	87

Table II
Sample of Equity Mutual Funds by Country and Benchmark Type

This table presents the total net assets (TNA) of the sample open-end equity mutual funds per domicile country and benchmark type for the final sample of Lipper funds with holdings in Lionshares as of December 2007. All benchmarks are classified into "World", "Regional" and "Country or Sector". The "Country or Sector" category is further broken down into funds investing in same country where they are domiciled ("Domestic") and funds investing in a different country from their domicile country ("Foreign"). The sample includes active and passive (exchange-traded and index) funds. "Explicit Indexing" is the percentage of TNA that passive funds represent of the total TNA in a country. "Closet indexing" is the percentage of TNA that active funds with Active Share (AS) measure below 0.6 represent of the total TNA of active funds in a country. Refer to Appendix B for detailed information on the (declared) benchmarks.

	World			Regional			Country or Sector - Domestic			Country or Sector - Foreign		
Domicile Country	TNA ($bil) (1)	Explicit Indexing (%) (2)	Closet Indexing (%) AS<0.6 (3)	TNA ($bil) (4)	Explicit Indexing (%) (5)	Closet Indexing (%) AS<0.6 (6)	TNA ($bil) (7)	Explicit Indexing (%) (8)	Closet Indexing (%) AS<0.6 (9)	TNA ($bil) (10)	Explicit Indexing (%) (11)	Closet Indexing (%) AS<0.6 (12)
Austria	3.1	3	3	11.2	7	49	1.8	0	100	3.0	12	24
Belgium	4.5	4	54	13.6	5	37	3.7	16	96	5.6	6	62
Canada	77.6	1	0	17.3	2	3	162.2	2	70	38.2	2	13
Denmark	13.7	0	10	13.0	0	25	4.2	6	98	6.3	9	57
Dublin	16.3	22	15	80.2	22	44				61.0	31	36
Finland	2.2	0	0	9.9	8	23	4.5	2	83	3.4	0	47
France	20.0	8	6	104.8	14	63	58.4	8	88	31.6	28	46
Germany	49.3	0	2	59.2	18	30	49.6	14	87	13.8	17	27
Ireland	1.9	10	0	6.8	0	40				5.0	0	17
Italy	11.4	1	36	37.5	0	62	12.9	0	96	11.1	0	50
Luxembourg	92.3	1	5	420.2	3	30				267.1	3	27
Netherlands	22.6	0	0	4.0	0	25	4.1	10	58	2.5	0	13
Norway	8.8	13	0	8.9	4	17	9.5	2	39	4.7	31	43
Poland	0.0	0	0	0.9	0	2	11.4	0	89	0.2	0	0
Portugal	0.7	0	0	1.9	0	8	1.6	1	100	0.3	0	24
Spain	2.6	0	0	17.8	8	40	11.9	13	78	1.9	2	39
Sweden	26.9	1	7	25.8	9	56	44.3	9	82	6.6	4	48
Switzerland	4.5	0	12	10.7	11	42	26.2	42	97	6.0	8	50
UK	49.0	0	3	110.0	5	13	257.2	11	67	50.1	6	15
Asia Pacific	17.8	6	53	13.1	0	38	95.1	14	31	8.2	1	23
Total (Non-USA)	425.1	2	7	966.7	7	38	758.6	10	75	526.3	9	29
USA	931.0	4	3	524.0	39	7	3,736.9	21	16	103.7	47	17
Total	1,356.0	3	4	1,490.7	18	27	4,495.5	19	26	630.0	15	27

Table III
Average Fund Fees by Country

This table presents the number of funds and average fees in percentage points as of 2007 per country. The average fees are computed on a value-weighted basis using the fund's TNA as the weight. The sample includes open-end active and passive (exchange-traded and index) equity mutual funds from Lipper for which holdings are available in Lionshares. Total Expense Ratio represents all annual expenses levied by a fund on its investors, covering investment management, administration, servicing, legal, etc. Management Fee is the management fee that represents the charges levied each year by funds for management. Total Shareholder Cost includes the total expense ratio (or management fee if the total expense ratio is unavailable) plus annualized load (assuming a five-year holding period).

				Total Shareholder Cost by Fund Type			Total Shareholder Cost by Benchmark Type			
	Total Expense Ratio	Management Fee	Total Shareholder Cost	Active	ETF	Index Funds	World	Regional	Country or Sector (Dom.)	Country or Sector (Foreign)
Domicile Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Austria	1.71	1.69	2.60	2.64		2.11	2.49	2.73	2.46	2.57
Belgium	1.18	0.93	1.70	1.73		1.22	1.53	1.73	1.88	1.80
Canada		1.83	2.37	2.40		0.93	2.72	2.42	2.28	2.25
Denmark	1.22	1.32	1.70	1.72		0.86	1.79	1.77	1.48	1.60
Dublin	1.34	1.14	1.98	2.50	0.42	0.62	2.21	2.50		2.58
Finland		1.64	1.85	1.91		0.60	1.46	1.99	1.86	2.05
France	1.39	1.43	1.95	2.13	0.59	1.15	2.07	2.12	2.20	2.09
Germany	1.30	1.22	2.16	2.34	0.64	1.58	2.37	2.32	2.31	2.39
Ireland	1.77	1.44	2.61	2.62		2.00	2.24	2.73		2.60
Italy	2.19	1.99	2.52	2.52		2.32	2.59	2.53	2.46	2.48
Luxembourg	1.86	1.48	2.78	2.82	0.92	1.76	2.70	2.82		2.85
Netherlands	1.46	1.03	1.16	1.17		0.60	1.08	1.46	1.21	1.43
Norway		1.38	1.68	1.83	0.44	0.33	1.35	2.38	1.63	2.04
Poland		3.53	4.23	4.23			5.00	3.52	4.27	5.00
Portugal		2.00	2.04	2.04		1.03	1.93	2.09	2.00	2.23
Spain	2.01	1.88	1.90	1.97	0.32	1.36	1.89	2.01	1.94	1.93
Sweden	2.51	1.27	1.34	1.39	0.53	0.65	1.26	1.71	1.28	1.51
Switzerland	1.15	1.13	1.99	2.26	1.38	1.13	1.98	2.66	2.03	2.46
UK	1.46	1.37	2.27	2.40		0.81	2.31	2.42	2.38	2.52
Asia Pacific	1.57	1.23	1.63	1.77	0.15	0.92	1.71	2.07	1.67	2.44
Total (Non-USA)			1.69	1.91	0.34	0.43	1.89	2.56	1.54	2.87
USA	0.78	0.48	1.16	1.38	0.30	0.26	1.60	1.29	1.32	1.60
Total	0.99	0.81	1.54	1.76	0.33	0.38	1.81	2.20	1.48	2.51

Table IV
Mutual Fund Fees and Active versus Passive Management

This table presents results for regressions where the dependent variable is total shareholder cost for each actively managed fund in 2007. Total shareholder cost is defined as expense ratio plus annualized load (assuming a five-year holding period). The sample includes open-end active equity mutual funds taken from Lipper for which holdings are available in Lionshares. Active share is defined as the percentage of a fund's portfolio holdings that differ from the fund's benchmark. "Explicit indexing" is the percentage of TNA that passive funds represent of the total TNA of all funds domiciled in the same country as the fund ("by country") or in the same country and with the same benchmark type as the fund ("by country/type"). "Closet indexing" is the percentage of TNA that active funds with Active Share (AS) measure below 0.6 represent of the total TNA of active funds in that fund's domicile country ("by country") or in that fund's domicile country and with the same benchmark type ("by country/type"). Regressions include geographical focus fixed effects. Refer to Appendix B for variable definitions. Robust t-statistics corrected for geographical focus clustering are reported in parentheses. *, **, *** reflects significance at the 10%, 5% and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Active share	0.7931***	0.5648***	0.7302***	1.0897***	0.8056***	0.8499***	0.8705***	0.7586***	0.7867***	0.8002***		0.8137***
	(6.36)	(4.86)	(7.97)	(3.31)	(6.52)	(6.93)	(7.15)	(6.71)	(6.58)	(6.78)		(6.90)
Explicit indexing (by country)					-0.7573**		-0.9332***				-0.6630**	-0.8158***
					(-2.35)		(-3.52)				(-2.32)	(-3.13)
Closet indexing (by country)						0.7680***	0.8385***				0.9341***	0.9615***
						(3.70)	(3.99)				(5.23)	(5.34)
Explicit indexing (by country/type)								-0.5363***		-0.7055***	-0.1448	-0.1501
								(-3.59)		(-3.49)	(-0.63)	(-0.75)
Closet indexing (by country/type)									-0.0198	0.1622	-0.3852***	-0.1680
									(-0.21)	(1.55)	(-3.53)	(-1.64)
TNA (log)	-0.0828***	-0.0750*	-0.0124**	-0.1575***	-0.0820***	-0.0809***	-0.0798**	-0.0820***	-0.0828***	-0.0813***	-0.0869***	-0.0799**
	(-2.77)	(-2.04)	(-2.02)	(-8.60)	(-2.75)	(-2.69)	(-2.65)	(-2.72)	(-2.76)	(-2.71)	(-2.73)	(-2.64)
Fund age	0.0077***	0.0067**	0.0041**	0.0124***	0.0079***	0.0078***	0.0080***	0.0078***	0.0077***	0.0079***	0.0070***	0.0080***
	(3.76)	(2.28)	(2.43)	(5.95)	(3.94)	(3.77)	(4.01)	(3.74)	(3.75)	(3.79)	(3.10)	(3.89)
Domestic dummy	-0.5105***	-0.0501	-0.3833***		-0.4227***	-0.4038***	-0.2859***	-0.4717***	-0.5163***	-0.4117***	-0.3574***	-0.3211***
	(-5.51)	(-0.98)	(-4.68)		(-4.23)	(-5.79)	(-3.45)	(-4.92)	(-4.84)	(-4.43)	(-3.78)	(-3.61)
Flows	0.0275**	0.0246*	0.0180***	0.2350***	0.0282**	0.0251**	0.0258**	0.0279**	0.0276**	0.0270**	0.0309**	0.0264**
	(2.33)	(2.02)	(7.95)	(11.20)	(2.41)	(2.11)	(2.18)	(2.37)	(2.31)	(2.31)	(2.47)	(2.24)
Sample of active funds	All	All	Non-U.S.	U.S.	All	All	All	All	All	All	All	All
Geographic focus dummies	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	Yes	No	No	No	No	No	No	No	No	No	No
Observations	6801	6801	4434	2367	6801	6801	6801	6801	6801	6801	6801	6801
R-squared	0.147	0.185	0.223	0.066	0.149	0.152	0.154	0.149	0.147	0.150	0.140	0.155

Table V
Determinants of Active Management

This table presents results for regressions where the dependent variable is the Active Share for each fund-year. Active Share is defined as the percentage of a fund's portfolio holdings that differ from the fund's benchmark. The sample of funds includes open-end active equity mutual funds taken from Lipper for which holdings are available in Lionshares. "Explicit indexing" is the percentage of TNA that passive funds represent of the total TNA of all funds domiciled in the same country as the fund ("by country") or in the same country and with the same benchmark type as the fund ("by country/type"). "Closet indexing" is the percentage of TNA that active funds with Active Share (AS) measure below 0.6 represent of the total TNA of active funds in that fund's domicile country ("by country") or in that fund's domicile country and with the same benchmark type ("by country/type"). Regressions include geographical focus and year fixed effects. Refer to Appendix C for variable definitions. Robust t-statistics corrected for geographical focus clustering are reported in parentheses. *, **, *** reflects significance at the 10%, 5% and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Explicit indexing (by country)	0.1782***		0.1713***				0.0608
	(3.13)		(3.74)				(1.56)
Closet indexing (by country)		-0.2266***	-0.2252***				0.0226
		(-8.26)	(-8.24)				(0.71)
Explicit indexing (by country/type)				-0.1984*		0.1101**	0.0951*
				(-1.97)		(2.39)	(1.99)
Closet indexing (by country/type)					-0.2660***	-0.2881***	-0.2902***
					(-18.54)	(-14.58)	(-12.80)
R-squared (logistic)	-0.0912***	-0.0877***	-0.0876***	-0.0905***	-0.0854***	-0.0854***	-0.0857***
	(-12.72)	(-12.25)	(-12.11)	(-12.84)	(-12.20)	(-12.12)	(-12.00)
Total shareholder cost	0.0084	0.0091*	0.0092*	0.0076	0.0072	0.0075	0.0074
	(1.67)	(1.68)	(1.69)	(1.47)	(1.49)	(1.52)	(1.53)
TNA (log)	-0.0037**	-0.0042***	-0.0042***	-0.0036**	-0.0039**	-0.0040**	-0.0039**
	(-2.18)	(-2.78)	(-2.81)	(-2.02)	(-2.35)	(-2.48)	(-2.39)
Fund age	-0.0010***	-0.0010***	-0.0010***	-0.0009***	-0.0008***	-0.0008***	-0.0008***
	(-5.98)	(-5.48)	(-5.59)	(-5.03)	(-5.34)	(-5.42)	(-5.36)
Domestic dummy	0.0801	0.0642**	0.0401	0.1206**	0.0146	-0.0013	-0.0054
	(1.55)	(2.13)	(1.12)	(2.54)	(0.60)	(-0.05)	(-0.20)
Flows	0.0067**	0.0051*	0.0053*	0.0061*	0.0026	0.0025	0.0026
	(2.12)	(1.84)	(1.92)	(1.97)	(0.97)	(0.95)	(1.01)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic focus dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28198	28198	28198	28198	28198	28198	28198
R-squared	0.580	0.589	0.591	0.583	0.628	0.629	0.630

Table VI
Abnormal Fund Performance Statistics

This table presents statistics on fund abnormal performance measures. The sample includes open-end active equity mutual funds taken from Lipper for which holdings are available in Lionshares. Benchmark-adjusted returns are the difference between the fund return and its benchmark return. Four-factor benchmark-adjusted alphas are estimated using three-year of past monthly fund benchmark-adjusted returns in U.S. dollars with regional factors (Asia, Europe and North America) or world factors in the case of global funds. Panel A presents the percentage of active fund-year observations with positive abnormal performance per country. Panel B presents the percentage of active fund-year observations with positive abnormal performance per level of Active Share. Panel C presents the average abnormal fund performance per level of Active Share.

Panel A: Percentage of Fund-Year Observations with Positive Abnormal Performance - Per Country

	Benchmark-adjusted Return					Four-factor Benchmark-Adjusted Alpha				
Domicile Country	All funds (1)	World (2)	Regional (3)	Country or Sector (Dom.) (4)	Country or Sector (Foreign) (5)	All funds (6)	World (7)	Regional (8)	Country or Sector (Dom.) (9)	Country or Sector (Foreign) (10)
Austria	48.6	39.3	56.6	67.9	38.6	42.6	42.3	47.8	46.4	33.1
Belgium	44.1	37.1	55.4	45.1	35.1	38.2	32.1	41.9	48.4	33.8
Canada	39.2	35.2	54.3	37.3	39.1	37.0	26.6	48.4	44.5	31.9
Denmark	49.9	45.3	58.3	61.7	32.8	37.4	25.0	45.1	51.4	28.4
Dublin	41.9	36.0	49.5		38.1	30.6	21.8	36.1		29.2
Finland	51.8	46.1	58.8	60.7	33.3	36.1	36.8	40.6	37.5	25.5
France	52.2	44.2	55.2	68.2	38.7	41.3	24.3	45.0	57.8	30.8
Germany	51.0	47.9	65.8	33.6	43.0	42.6	25.9	53.8	59.2	35.5
Ireland	51.4	46.7	57.6		48.1	33.5	13.3	34.8		40.3
Italy	44.9	29.7	47.5	77.4	31.0	40.3	24.7	44.0	69.7	26.9
Luxembourg	45.0	42.5	52.4		39.3	33.3	27.4	40.3		29.5
Netherlands	54.6	38.4	66.1	67.2	47.3	46.5	33.3	56.5	62.1	35.1
Norway	51.2	53.7	66.0	43.6	44.1	40.0	30.5	40.3	43.2	41.2
Poland	34.8	20.0	60.0	32.6	22.2	53.0	20.0	53.3	57.0	33.3
Portugal	52.3	55.9	49.4	63.5	30.2	36.2	29.4	42.5	38.5	23.3
Spain	37.0	36.1	38.5	43.0	24.1	34.7	28.2	37.9	37.7	27.3
Sweden	54.7	46.9	60.0	63.8	33.1	48.7	34.2	42.2	69.6	23.8
Switzerland	32.3	39.0	35.3	25.2	30.6	30.9	27.0	38.5	22.1	33.9
UK	48.2	60.0	45.3	50.9	37.8	35.7	38.0	34.3	36.4	34.4
USA	47.5	55.9	43.6	46.7	50.4	34.5	38.2	40.1	33.8	29.9
Asia Pacific	49.4	53.9	46.8		42.2	36.2	18.9	42.1		32.7
Total	46.7	45.5	51.7	48.1	38.6	36.2	30.3	41.7	37.8	30.6

Panel B: Percentage of Fund-Year Observations with Positive Abnormal Performance - per Level of Active Share

	Benchmark-adjusted Return					Four-factor Benchmark-Adjusted Alpha				
	All funds	World	Regional	Country or Sector (Dom.)	Country or Sector (Foreign)	All funds	World	Regional	Country or Sector (Dom.)	Country or Sector (Foreign)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total	46.7	45.5	51.7	48.1	38.6	36.2	30.3	41.7	37.8	30.6
Active Share < 60%		23.5	50.6	47.9	34.5		18.6	43.1	44.7	28.2
60% < Active Share < 90%		42.5	51.3	47.5	39.1		29.2	40.6	35.8	30.8
Active Share > 90%		60.2	60.8	49.4	45.8		37.1	42.2	34.3	34.7

Panel C: Average Abnormal Fund Performance - per Level of Active Share

	Benchmark-adjusted Return					Four-factor Benchmark-Adjusted Alpha				
	All funds	World	Regional	Country or Sector	Country or Sector	All funds	World	Regional	Country or Sector	Country or Sector
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total	0.63%	1.98%	1.69%	0.16%	-0.54%	-0.67%	-0.55%	0.48%	-0.80%	-2.19%
Active Share < 60%		-0.13%	1.13%	-0.19%	-2.39%		-1.90%	0.31%	-0.98%	-4.48%
60% < Active Share < 90%		1.63%	1.82%	0.44%	-0.75%		-0.51%	0.28%	-0.98%	-2.10%
Active Share > 90%		3.64%	5.31%	-0.12%	4.45%		-0.16%	5.52%	-0.13%	2.84%

Table VII
Fund Performance and Active Management

This table presents results of regressions where the dependent variable is the benchmark-adjusted return (Panel A), the four-factor benchmark-adjusted alpha (Panel B) and the four-factor benchmark-adjusted information ratio (Panel C) for each fund-year. Benchmark-adjusted returns are the difference between the fund return and its benchmark return. Four-factor benchmark-adjusted alphas are estimated using three-year of past monthly fund benchmark-adjusted returns in U.S. dollars with regional factors (Asia, Europe and North America) or world factors in the case of global funds. The information ratio is the ratio of the alpha to the idiosyncratic volatility from the four-factor model. Active share is defined as the percentage of a fund's portfolio holdings that differ from the fund's benchmark. R-squared is obtained from the regression of a fund return on fund's benchmark return estimated using three-year of past monthly U.S. dollars returns. The sample includes only active open-end equity mutual funds taken from Lipper for which holdings are available from Lionshares. All explanatory variables are lagged by one period. Regressions include benchmark and year fixed effects. Refer to Appendix C for variable definitions. Robust t-statistics corrected for fund clustering are reported in parentheses. *, **, *** reflects significance at the 10%, 5% and 1% levels.

Panel A: Benchmark-adjusted Returns

	(1)	(2)	(3)	(4)	(5)
Active share	0.0470***		0.0444***	0.0500***	0.0325***
	(12.51)		(9.95)	(10.43)	(3.12)
R-squared (logistic)		-0.0042***	-0.0002	-0.0020**	0.0001
		(-8.02)	(-0.26)	(-2.02)	(0.04)
Total shareholder cost	-0.5014***	-0.3774***	-0.5080***	-0.3757***	-0.5187***
	(-7.06)	(-7.94)	(-6.62)	(-3.34)	(-5.22)
TNA (log)	0.0008**	0.0011***	0.0013***	0.0018***	0.0014**
	(2.31)	(4.68)	(3.51)	(3.92)	(2.50)
Fund age	-0.0134**	-0.0106**	-0.0082	0.0008	-0.0159**
	(-2.54)	(-2.42)	(-1.52)	(0.10)	(-2.20)
Domestic dummy	0.0032	0.0100***	0.0017	0.0101***	0.0192
	(1.48)	(5.90)	(0.72)	(2.93)	(1.32)
Flows	0.0028	0.0028	0.0060***	0.0043***	0.0217
	(1.40)	(0.88)	(2.67)	(3.07)	(1.08)
Sample of active funds	All	All	All	Non-U.S.	U.S.
Year dummies	Yes	Yes	Yes	Yes	Yes
Benchmark dummies	Yes	Yes	Yes	Yes	Yes
Observations	25269	49438	22026	12637	9389
R-squared	0.111	0.100	0.114	0.119	0.165

Panel B: Four-Factor Benchmark-adjusted Alphas

	(1)	(2)	(3)	(4)	(5)
Active share	0.0246***		0.0203***	0.0085	0.0477***
	(5.37)		(3.73)	(1.43)	(4.11)
R-squared (logistic)		-0.0004	-0.0016	-0.0031**	0.0019
		(-0.58)	(-1.41)	(-2.13)	(0.99)
Total shareholder cost	-0.7697***	-0.5474***	-0.7916***	-0.0057	-0.9535***
	(-7.43)	(-6.06)	(-8.19)	(-0.04)	(-12.65)
TNA (log)	0.0001	0.0006*	0.0005	0.0014**	-0.0004
	(0.21)	(1.91)	(1.08)	(2.57)	(-0.51)
Fund age	-0.0174***	-0.0175***	-0.0142**	-0.0291***	-0.0059
	(-2.96)	(-3.60)	(-2.43)	(-3.16)	(-0.78)
Domestic dummy	-0.0045	0.0083***	-0.0048*	-0.0063	-0.0351
	(-1.54)	(3.65)	(-1.66)	(-1.57)	(-0.92)
Flows	0.0083***	0.0049	0.0079***	0.0069***	0.0075
	(3.31)	(1.62)	(3.48)	(4.51)	(0.29)
Sample of active funds	All	All	All	Non-U.S.	U.S.
Year dummies	Yes	Yes	Yes	Yes	Yes
Benchmark dummies	Yes	Yes	Yes	Yes	Yes
Observations	22508	47491	20975	12637	8338
R-squared	0.099	0.093	0.094	0.113	0.081

Panel C: Four-Factor Benchmark-adjusted Information Ratio

	(1)	(2)	(3)	(4)	(5)
Active share	0.815***		0.200**	-0.0185	1.128***
	(10.03)		(2.08)	(-0.17)	(4.79)
R-squared (logistic)		-0.159***	-0.199***	-0.279***	-0.0341
		(-15.71)	(-10.70)	(-11.37)	(-1.12)
Total shareholder cost	-6.904***	-4.816***	-7.638***	-6.404**	-7.486***
	(-4.73)	(-5.16)	(-4.79)	(-2.56)	(-3.92)
TNA (log)	-0.00137	0.0122**	0.00532	0.0296***	-0.0148
	(-0.18)	(2.40)	(0.67)	(2.84)	(-1.20)
Fund age	-0.312**	-0.267***	-0.203	-0.517***	-0.0114
	(-2.44)	(-2.76)	(-1.60)	(-2.67)	(-0.07)
Domestic dummy	-0.0152	0.117***	0.0266	-0.0702	-0.0417
	(-0.26)	(3.26)	(0.46)	(-0.92)	(-0.11)
Flows	0.174***	0.0953	0.182***	0.141***	0.475
	(4.41)	(1.61)	(4.44)	(5.75)	(1.44)
Sample of active funds	All	All	All	Non-U.S.	U.S.
Year dummies	Yes	Yes	Yes	Yes	Yes
Benchmark dummies	Yes	Yes	Yes	Yes	Yes
Observations	22508	47491	20975	12637	8338
R-squared	0.081	0.092	0.090	0.123	0.076

Table VIII
Mutual Fund Fees and Active Management: The Effect of Competition

This table presents results for regressions where the dependent variable is total shareholder cost for each fund in 2007. Total shareholder cost is defined as expense ratio plus annualized load (assuming a five-year holding period). The sample includes only open-end active equity mutual funds taken from Lipper for which holdings are available in Lionshares. Active share is defined as the percentage of a fund's portfolio holdings that differ from the fund's benchmark. "Explicit indexing" is the percentage of TNA that passive funds represent of the total TNA of all funds domiciled in the same country as the fund ("by country") or in the same country and with the same benchmark type as the fund ("by country/type"). "Closet indexing" is the percentage of TNA that active funds with Active Share (AS) measure below 0.6 represent of the total TNA of active funds in that fund's domicile country ("by country") or in that fund's domicile country and with the same benchmark type ("by country/type"). Regressions include geographical focus fixed effects. Refer to Appendix C for variable definitions. Robust t-statistics corrected for geographical focus clustering are reported in parentheses. *, **, *** reflects significance at the 10%, 5% and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Active share	0.0086**	0.0076***	-0.0337***	0.0083***	0.0114***	0.0131***	0.0116***
	(2.50)	(6.35)	(-3.81)	(3.39)	(5.40)	(3.53)	(5.13)
Setup time	0.0000						
	(0.03)						
Active share x Setup time	-0.0000						
	(-0.17)						
Setup cost		-0.0000**					
		(-2.66)					
Active share x Setup cost		0.0000					
		(1.04)					
Financial sophistication			-0.0059***				
			(-6.26)				
Active share x Financial sophistication			0.0069***				
			(4.53)				
Fund industry foreign share				0.0136**			
				(2.03)			
Active share x Fund industry foreign share				-0.0042			
				(-0.48)			
Fund industry Herfindahl					0.0048		
					(0.41)		
Active share x Fund industry Herfindahl					-0.0550***		
					(-2.98)		
Explicit indexing (by country)						-0.0047	
						(-0.44)	
Active share x Explicit indexing (by country)						-0.0063	
						(-0.46)	
Closet indexing (by country)						0.0142**	
						(2.39)	
Active share x Closet indexing (by country)						-0.0083	
						(-1.00)	
Explicit indexing (by country/type)							-0.0041
							(-0.68)
Active share x Explicit indexing (by country/type)							-0.0040
							(-0.56)
Closet indexing (by country/type)							0.0067*
							(1.81)
Active share x Closet indexing (by country/type)							-0.0068
							(-1.41)
TNA (log)	-0.0008***	-0.0009***	-0.0008***	-0.0008***	-0.0009***	-0.0008***	-0.0008***
	(-2.85)	(-2.92)	(-2.72)	(-2.82)	(-3.10)	(-2.69)	(-2.73)
Fund age	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***
	(3.47)	(3.70)	(4.21)	(3.96)	(3.59)	(3.95)	(3.72)
Domestic dummy	-0.0050***	-0.0031**	-0.0052***	-0.0040***	-0.0050***	-0.0030***	-0.0041***
	(-5.45)	(-2.59)	(-7.08)	(-5.94)	(-3.96)	(-3.27)	(-4.01)
Flows	0.0003**	0.0002*	0.0003**	0.0003**	0.0002**	0.0003**	0.0003**
	(2.33)	(1.96)	(2.41)	(2.37)	(2.03)	(2.17)	(2.32)
Geographic focus dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6618	5405	6801	6790	6790	6801	6801
R-squared	0.145	0.170	0.153	0.158	0.157	0.154	0.151

Table IX
Fund Performance and Active Management: The Effect of Competition

This table presents results of regressions where the dependent variable is the four-factor benchmark-adjusted alpha. Benchmark-adjusted returns are the difference between the fund return and its benchmark return. Four-factor benchmark-adjusted alphas are estimated using three-year of past monthly fund benchmark-adjusted returns in U.S. dollars with regional factors (Asia, Europe and North America) or world factors in the case of global funds. Active share is defined as the percentage of a fund's portfolio holdings that differ from the fund's benchmark. The sample includes only active open-end equity mutual funds taken from Lipper for which holdings are available from Lionshares. All explanatory variables are lagged by one period. Regressions include benchmark and year fixed effects. Refer to Appendix C for variable definitions. Robust t-statistics corrected for fund clustering are reported in parentheses. *, **, *** reflects significance at the 10%, 5% and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Active share	0.0140	0.0184***	0.0301	0.0375***	0.0346***	0.0714***	0.0482***
	(1.25)	(2.62)	(0.89)	(6.08)	(4.46)	(4.54)	(5.63)
Setup time	-0.0001						
	(-1.30)						
Active share x Setup time	0.0001						
	(1.17)						
Setup cost		-0.0001**					
		(-2.17)					
Active share x Setup cost		0.0001**					
		(2.42)					
Financial sophistication			0.0008				
			(0.23)				
Active share x Financial sophistication			-0.0009				
			(-0.17)				
Fund industry foreign share				0.0736***			
				(4.39)			
Active share x Fund industry foreign share				-0.0761***			
				(-3.06)			
Fund industry Herfindahl					0.0190		
					(0.36)		
Active share x Fund industry Herfindahl					-0.1421*		
					(-1.68)		
Explicit indexing (by country)						0.0432	
						(1.29)	
Active share x Explicit indexing (by country)						-0.1124**	
						(-2.07)	
Closet indexing (by country)						0.0299*	
						(1.88)	
Active share x Closet indexing (by country)						-0.0722***	
						(-2.81)	
Explicit indexing (by country/type)							0.0292
							(1.21)
Active share x Explicit indexing (by country/type)							-0.0808**
							(-2.04)
Closet indexing (by country/type)							0.0080
							(0.77)
Active share x Closet indexing (by country/type)							-0.0328**
							(-2.09)
Total shareholder cost	-0.7698***	-0.8292***	-0.7688***	-0.7899***	-0.7890***	-0.7839***	-0.7916***
	(-7.36)	(-8.97)	(-7.39)	(-8.03)	(-8.04)	(-7.85)	(-8.19)
TNA (log)	0.0002	-0.0002	0.0001	0.0000	-0.0000	0.0001	0.0002
	(0.50)	(-0.52)	(0.21)	(0.09)	(-0.01)	(0.20)	(0.52)
Fund age	-0.0167***	-0.0180***	-0.0175***	-0.0171***	-0.0182***	-0.0154***	-0.0152***
	(-2.82)	(-2.92)	(-2.96)	(-2.91)	(-3.09)	(-2.65)	(-2.61)
Domestic dummy	-0.0043	-0.0002	-0.0045	-0.0023	-0.0045	-0.0031	-0.0009
	(-1.39)	(-0.03)	(-1.54)	(-0.78)	(-1.54)	(-0.84)	(-0.22)
Flows	0.0080***	0.0075***	0.0083***	0.0080***	0.0079***	0.0081***	0.0080***
	(3.34)	(3.36)	(3.31)	(3.22)	(3.19)	(3.29)	(3.20)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Benchmark dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22060	17953	22508	22487	22487	22175	22175
R-squared	0.102	0.102	0.099	0.095	0.095	0.098	0.098

Figure 1
Explicit and Closet Indexing by Country

This figure shows the level of explicit indexing and closet indexing by domicile country. The sample includes active and passive (exchange-traded and index) funds. Explicit indexing is the percentage of TNA that passive funds represent of the total TNA in each country. Closet indexing is the percentage of TNA that active funds with Active Share (AS) measure below 60% represent of the total TNA in each country. Truly Active is the percentage of TNA that active funds with Active Share (AS) measure above 60% represent of the total TNA in each country.

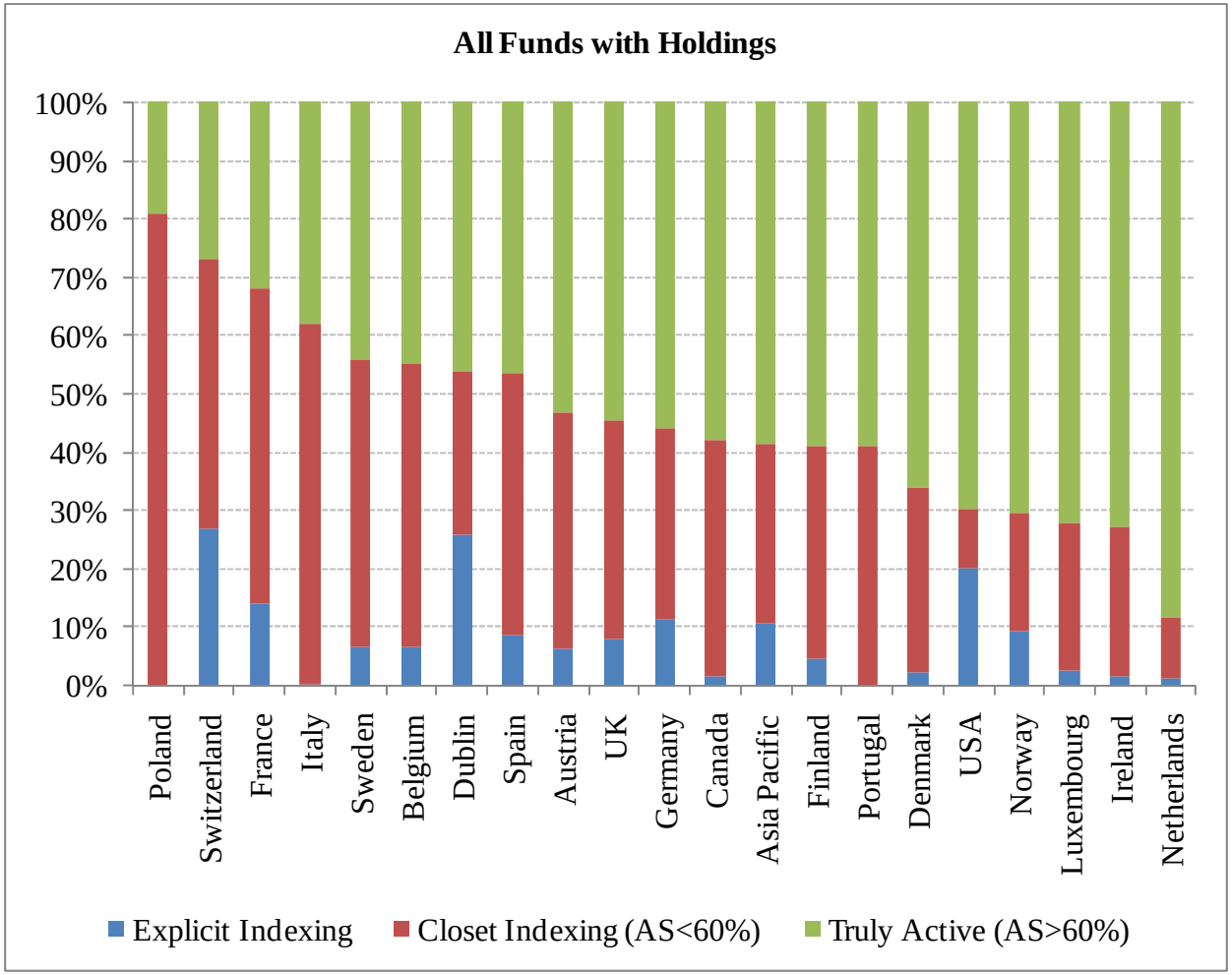
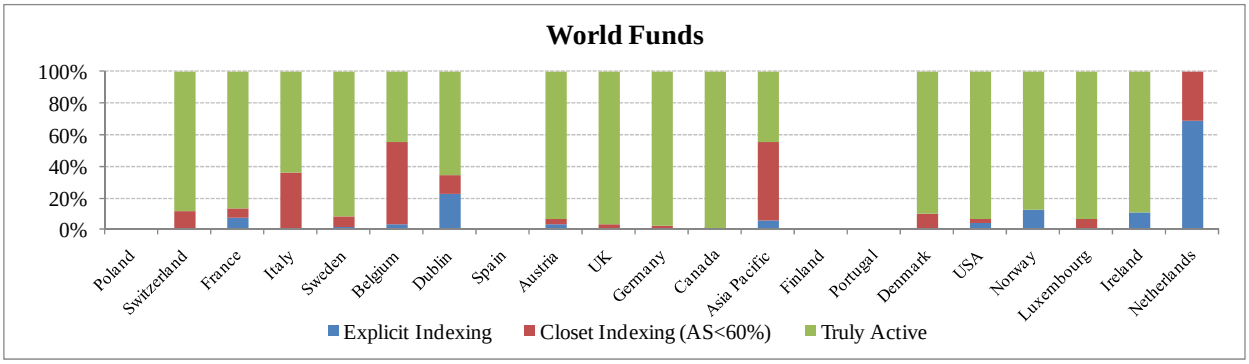
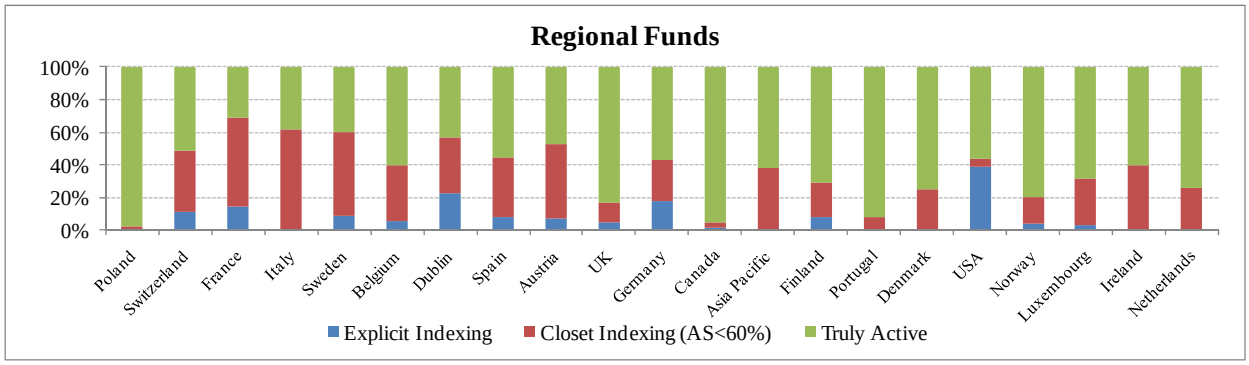
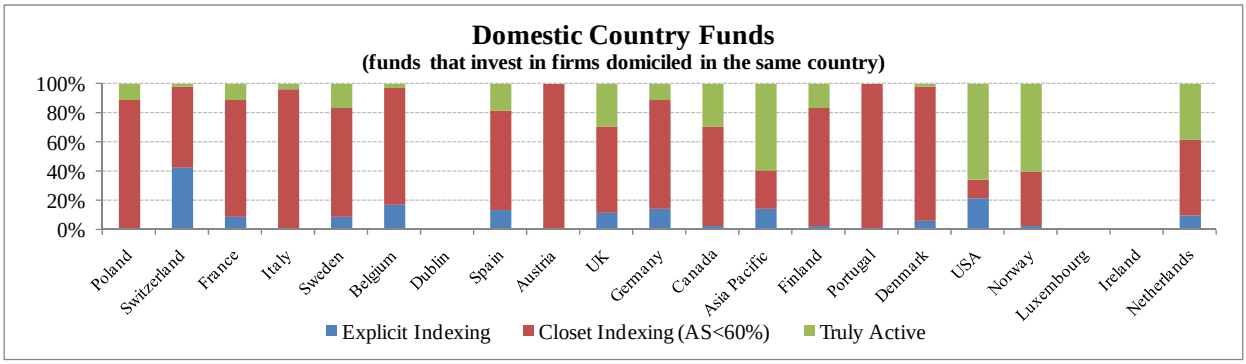


Figure 2
Explicit and Closet Indexing by Country and Benchmark Type

This figure shows the level of explicit indexing and closet indexing by domicile country. The sample includes active and passive (exchange-traded and index) funds. Explicit indexing is the percentage of TNA that passive funds represent of the total TNA in each country. Closet indexing is the percentage of TNA that active funds with Active Share (AS) measure below 60% represent of the total TNA in each country. Truly Active is the percentage of TNA that active funds with Active Share (AS) measure above 60% represent of the total TNA in each country.







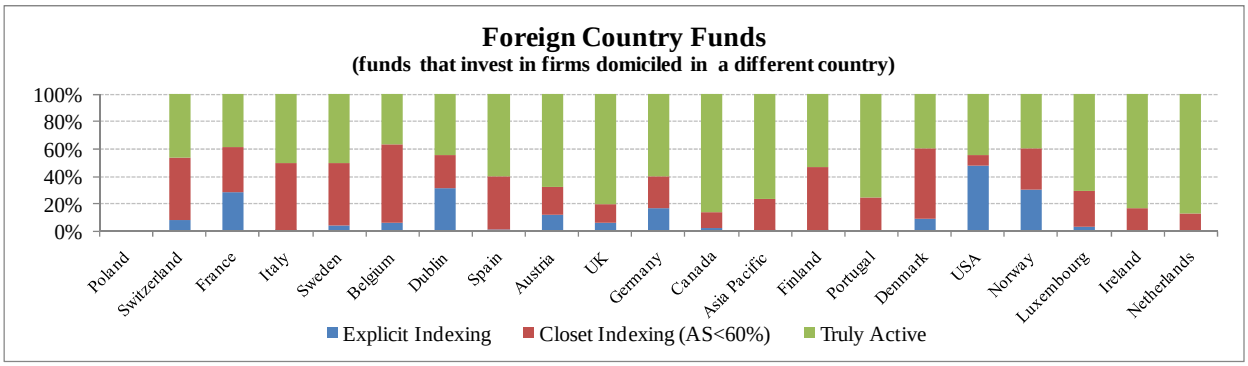
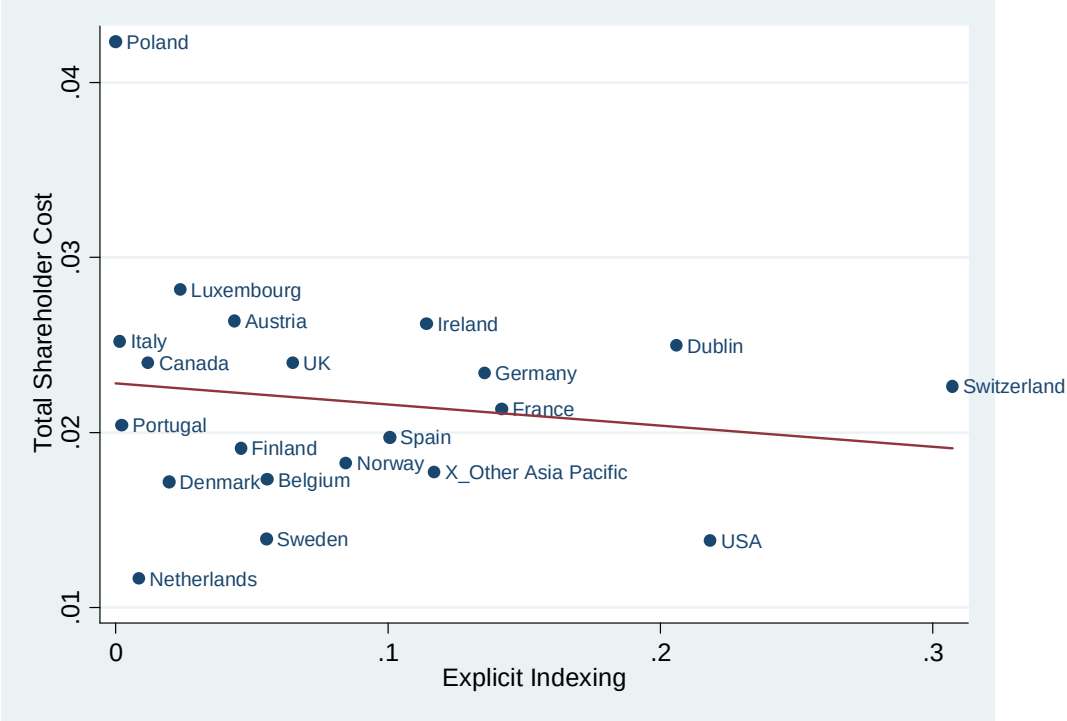
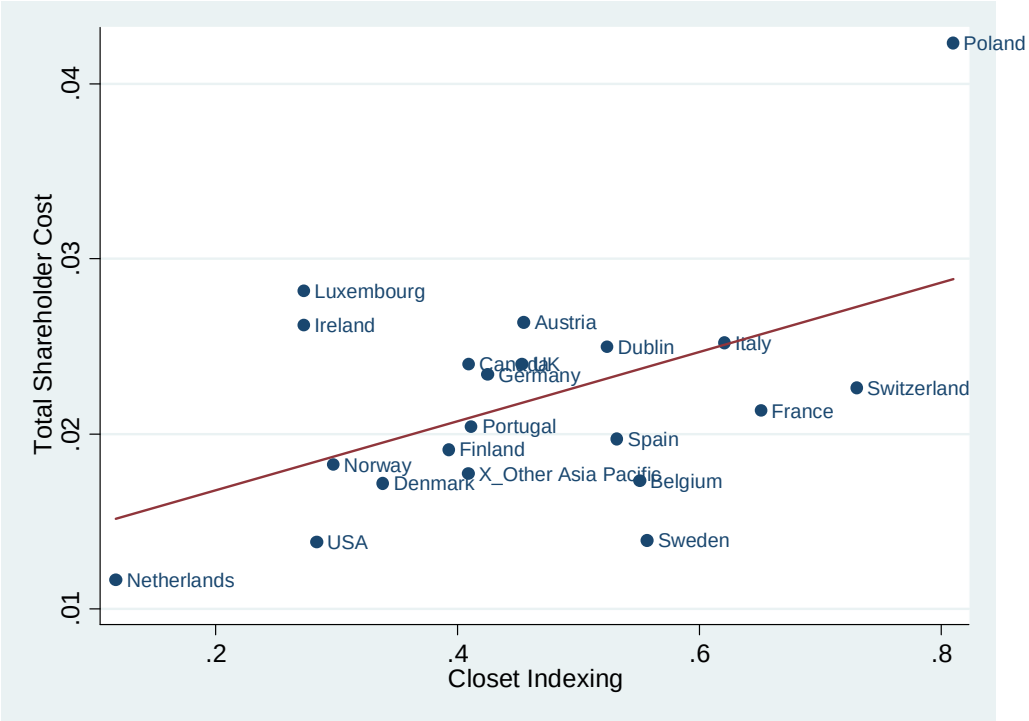


Figure 3

The Relation between Fund Fees and Indexing Across Countries

This figure plots the country average total shareholder cost of active open-end equity mutual funds versus country-level measures of fund indexing in 2007. The top panel uses explicit indexing defined as the percentage of TNA that passive funds represent of the total TNA in each country. The bottom panel uses closet indexing defined as the percentage of TNA that active funds with Active Share (AS) measure below 0.6 represent of the total TNA of active funds in each country.





Appendix A: Lipper-Lionshares Matching

This appendix describes briefly the matching algorithm used to merge the Lipper and Lionshares databases. The merge has involved the following steps.

Step 1 - Preparing the data. We first "clean" the fund names for accents and non-latin characters and remove other special characters (like ".;:\|/'"). Second, we drop identifiers of fund classes (as "class X shares", "series X" or "X" at the end of the string). Third, we handle abbreviations (like "smallcap", "mid cap", "large cap", "micro cap", "institutional", "international", "equity", "global", "fundamental value", "value", "growth", "growth and income", "metal", "index", "fixed", "aggressive", "company", "incorporated"). Fourth, we remove currency identifiers following the name of the fund in Lipper names (ISO currency codes are removed only if they appear at the end of the string). Finally, words are trimmed to get rid of excess blank spaces.

Step 2 - Calculate distances between fund names. We employ three metrics for the distance between Lipper and Lionshares fund names and potential matches are then found by comparing the distance between two fund names:

- String metric: The distance between two strings is defined as the minimum number of operations needed to transform one string into the other, where an operation is an insertion, deletion, or substitution of a single character (the Levenshtein distance). A distance of zero implies identical strings. Relying on the distance between fund names has advantages and disadvantages. The advantage is that we can get perfect or near perfect matches (distances of 0 or 1). The disadvantage is that it is too stringent: in many cases, the words are in different order (e.g. Fidelity Mid Cap Fund, Fidelity Fund MidCap); in others, the family is included in the name of the fund in one database but not in the other (e.g. Fidelity Advisors Fidelity

Mid Cap Fund, Fidelity Mid Cap Fund); sometimes some words are omitted (e.g. “fund”); finally, some funds have more detailed names than others.

- Sum metric: This measure is computed as follows. For any two strings, break them down into words of 3 or more characters (ignoring those with less than that). Let (w1, w2,...) be the set of words from the first string and (W1, W2,...) the set of words from the second string. Starting with w1, form all combinations with words from the second string: (w1, W1), (w1, W2)... For each combination, compute the string distance and select the combination in which the distance is the smallest. This identifies the closest word in the string 2 tow1. Repeat the same for w2, w3,... and sum all the (minimum) distances. This sum is the sum metric. Now, if the strings are identical up to a rearrangement or words (instead of letters), this distance will be zero. A distance of 1 indicates that, after rearranging the words to correspond to the closest possible match, there is one substitution, in one word, that would make the strings identical.
- Sup metric: Similar to the sum metric but uses the maximum distance between the closest match for each word.

Step 3 - Calculate the distance between fund management companies: Similar to step 2 but for fund management company names.

Step 4 - Matching with scores: Use a combination of fund name distance, fund management company distance and fund domicile. This creates a score for each match. For each Lionshares fund, select the three Lipper funds with the lowest scores.

Step 5 - Manual validation: We visually check matches and “flag” the correct match. In case of doubt, we check the fund websites to validate the match.

Step 6 - Matching remaining funds: We align the funds left unmatched from previous steps using a standard Term Frequency - Inverse Document Frequency model (TF-IDF), as described in Manning, Raghavan, and Schütze (2008). For each word *w*, we compute a scalar value known as the word's inverse document frequency (IDF), where $v^{(w)} = \log(D / D_w)$, where *D* is the total number of unmatched funds and D_w is the number of unmatched funds in which *w* appears. For each fund *f*, we compute its term frequency (TF) vector u_f, where the w^{th} coordinate of u_f corresponds to the number of times word *w* appears in the fund's name. Finally, we compute the TF-IDF vector of each fund *f* as $z_f^{(w)} = u_f^{(w)} \times v^{(w)}$.

The idea behind the TF-IDF model is to represent each fund name as a vector of word counts and weight each coordinate with an estimate of the corresponding word's discriminative power. After computing the TF-IDF model for all unmatched funds, we compute the similarity between two funds as the cosine of the angle formed by their corresponding TF-IDF vectors. This measure, known as cosine similarity, is commonly used in text modeling and information retrieval. Lastly, for each Lionshares fund, we select its most similar Lipper fund and manually validate the finding.

Appendix B
List of Benchmark Indices

This table lists the 77 (declared) benchmark indices that mutual funds in our sample track. Benchmarks are grouped by type. For each benchmark, we provide in brackets the sum of total net assets (in U.S. dollar billions) of the equity mutual funds tracking that index.

World Funds	Regional Funds	Country Funds		Sector Funds		
MSCI World TR USD [614]	Dow Jones Stoxx 50 CR [404]	Austria	ATX Prime CR [2]	World		FTSE AW/Oil & Gas TR [55]
MSCI World ex USA NR USD [496]	MSCI EAFE NR USD [227]	Belgium	Brussels SE TR [4]			FTSE AW/Basic Materials TR [2]
MSCI AC World TR USD [306]	MSCI EM (Emerging Markets) TR USD [160]	Canada	Toronto SE 300 Composite CR [218]			FTSE AW Oil & Gas TR [6]
MSCI World (GDP Weighted) CR USD [99]	Dow Jones Euro Stoxx 50 NR [196]	Denmark	OMX Copenhagen All Share TR [5]			MSCI World ex USA Small Cap NR USD [51]
MSCI World Value CR USD [64]	MSCI AC Asia Pacific ex Japan TR USD [140]	Finland	OMX Helsinki TR [5]			MSCI World/Consumer Staples TR [4]
MSCI World ex USA TR USD [51]	MSCI EM Far East TR USD [163]	France	CAC 40 CR [94]			MSCI World/Health Care TR [14]
MSCI Kokusai (World ex Japan) TR USD [6]	MSCI Europe ex UK TR USD [90]	Germany	DAX 30 TR [61]			
	MSCI EM Latin America TR USD [134]	Italy	MIBTEL CR [20]	Regional		FTSE AW Europe (Dev)/Real Estate TR [15]
	MSCI EM Eastern Europe TR USD [68]	Netherlands	AEX CR [14]			MSCI Europe Small Cap TR USD [50]
	MSCI BRIC TR USD [48]	Norway	MSCI Norway TR [12]			
	MSCI Golden Dragon TR USD [33]	Poland	Poland WIG TR [13]	Country		
	MSCI AC Asia Pacific TR USD [36]	Portugal	Portugal PSI General CR [2]		USA	NASDAQ 100 CR [15]
	MSCI EASEA (EAFE ex Japan) NR USD [61]	Spain	Madrid SE CR [15]			NASDAQ Composite CR [22]
	MSCI Nordic Countries TR USD [16]	Sweden	OMX Stockholm All Share CR [47]			Russell 1000 Growth TR [445]
	MSCI Europe ex Switzerland TR USD [4]	Switzerland	Swiss Performance Index TR [41]			Russell 1000 TR [196]
		UK	FTSE 100 TR [224]			Russell 1000 Value TR [419]
		USA	S&P 500 TR [1201]			Russell 2000 Growth TR [160]
		Asia Pacific	ASX All Ordinaries TR [114]			Russell 2000 TR [116]
			Hang Seng CR [4]			Russell 2000 Value TR [32]
			Bombay SE 100 CR [85]			Russell 3000 TR [406]
			MSCI Indonesia TR [4]			Russell MidCap Growth TR [766]
			Topix TR [161]			Russell MidCap TR [367]
			Korean SE KOSPI Composite CR [60]			Russell MidCap Value TR [114]
			Kuala Lumpur SE Composite CR [7]			S&P 100 CR [52]
			Singapore Straits Time CR [3]			S&P 500 Financials TR [11]
			Taiwan Weighted Price CR [10]			S&P 500 Utilities TR [18]
			Thailand SET CR [6]			S&P 600 TR [84]
						S&P Mid Cap 400 TR [60]
					UK	FTSE All Share TR [112]
					Other	MSCI Japan NR USD [31]
						Shanghai Composite CR [52]

Appendix C
Variable Definitions

Variable	Definition
Active share	Percentage of portfolio holdings that differ from the (declared) benchmark index holdings computed based on Lionshares mutual fund holdings data.
R-squared	R-squared from the regression of a fund return on fund's benchmark return estimated using three-year of past monthly U.S. dollars returns.
Benchmark-adjusted return	Difference between the fund return and its benchmark return.
Alpha	Four-factor alpha (percentage per year) estimated with three-year of past monthly fund benchmark-adusted returns in U.S. dollars and regional factors (Asia, Europe and North America) or world factors in the case of global funds.
Information ratio	Ratio of the four-factor alpha to idiosyncratic volatility estimated with three-year of past monthly fund benchmark-adusted returns in U.S. dollars and regional factors (Asia, Europe and North America) or world factors in the case of global funds.
TNA	Total net assets in million $ of the a fund primary share class (Lipper).
Fund age	Number of years since the fund launch date (Lipper).
Domestic dummy	Dummy that takes the value of one if a fund geographic focus is equal to the fund domicile country (Lipper).
Flows	Percentage growth in TNA (in local currency), net of internal growth (assuming reinvestment of dividends and distributions).
Explicit indexing	Percentage of TNA that passive funds (index funds and ETFs) represent of the total TNA of open-end equity mutual funds in a country or country/benchmark type (Lipper).
Closet indexing	Percentage of TNA that active funds with Active Share below 0.6 represent of the total TNA of open-end active equity mutual funds (Lipper).
Setup time	Time required to set up a new fund in days (Khorana, Servaes, and Tufano (2005)).
Setup cost	Cost of setting up a new fund in thousand U.S. dollars (Khorana, Servaes, and Tufano (2005)).
Financial sophistication	Survey-measure of financial sophistication (Global Competitiveness Report).
Fund industry foreign share	Market share of foreign parent management companies in each country (Lipper).
Fund industry Herfindahl	Sum of squared market shares of parent management companies for equity funds in each country (Lipper).