

On the Future of the Mutual Fund Industry around the World

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1. Introduction

Since the introduction of the first mutual fund in the United States in 1924, the fund industry has experienced tremendous growth, not only in the United States, but also worldwide. Khorana, et al. (2005) document that at the end of 2001, the global fund industry covered \$11.7 trillion in assets, forty percent of which was domiciled outside the United States, with a significant portion of the remaining assets concentrated in Luxembourg (\$750 billion), France (\$721 billion), Italy (\$360 billion), and Japan (\$343 billion).

This paper provides an overview of the fund industry worldwide and highlights our views on the future evolution of the industry. A lot of our thinking revolves around the changes that we expect to take place in the U.S., but where we expect contrasting trends to emerge in other countries, we highlight them separately. This is particularly important because we believe that more of the industry's future growth is expected to emanate from outside the U.S. It is obviously not possible to consider the future of the industry without providing proper facts and figures about where we currently stand. Each area of discussion will therefore start with a description of the current state of the industry, before embarking on an assessment of the future.

The next section of the paper summarizes some of our earlier work on size of the fund industry worldwide and the factors that are related to its success. We also discuss how legal and regulatory factors affect industry growth, and speculate as to what this implies for the future. We then turn to a description of the selling and distribution methods and contrast the approach employed in different countries (section 3), followed by some thoughts on how this process is likely to evolve going forward. Section 3 also describes fund costs across funds and across countries.

Section 4 analyzes newer types of funds that have been introduced such as index funds, funds of funds, and hedged mutual funds. What are the costs and benefits of these funds and will they become more important in the future?

Section 5 reviews aspects of fund investor behavior. While there have been a number of attempts to show that investor behavior with respect to their fund choice is fully rational, we find it difficult to support this contention. If investors are not fully rational, then funds can benefit from these irrationalities. In this section, we will illustrate actions that funds (can) take in light of observed investor behavior and its implications for the future.

Section 6 sheds light on various issues related to fund governance. What are the governance regulations in the U.S. and how do they differ in other countries? What evidence is there, if any, to indicate that required governance standards affect performance? And, more importantly, how do we expect governance standards to evolve in the future?

Section 7 deals with the tricky issue of performance. A majority of the academic research supports the view that fund managers cannot earn risk-adjusted excess returns sufficient to warrant the fees they charge. However, recent innovations in academic work suggest that particular subsets of fund managers do exhibit persistence in superior performance. We will review these findings and we will discuss implications for the future of the fund management industry.

In section 8 we report on concentration in the fund management industry and conjecture that there will be further consolidation in the future. We speculate on what this implies for investors and for the future profitability of the industry. Section 9 summarizes our thoughts regarding the future of the mutual fund industry.

2. The determinants of the size of the fund industry around the world

Table 1 provides a summary of the size of the fund industry around the world in 2001, based on Khorana, et al. (2005). Two conclusions emerge. First, not the U.S., but Luxembourg has the largest fund industry relative to its GDP or the size of its equity and debt market, followed by Ireland. This is attributable to the fact that Luxembourg and Ireland have become hubs for cross-European sales of funds. Funds are set up in both countries and offered for sale

in many other European countries. This obviously comes at the expense of industry size in the rest of Europe. Hong Kong ranks third, again because many of the funds domiciled in Hong Kong are also sold elsewhere. Fourth on the list is Australia with industry size to GDP of 93.4% (compared to 68.3% in the US). These funds are sold domestically; so if we ignore cross-border sales, Australia actually has the largest fund industry in the world (using industry size to GDP as the measurement metric).

Second, in many countries, the industry is very small relative to both GDP and the size of the debt and equity market, hence implying a large future growth potential. Markets that stand out in particular are China, India, Russia, and perhaps Turkey. These are all countries with a relatively large GDP, but only a small fund industry. If each of these markets were to grow in size to the sample median assets to GDP, this would add \$97 billion in assets in China, \$29 billion in India, \$27 billion in Russia, and \$10 billion Turkey. While these numbers are small relatively to the size of the US market, these figures are clearly conservative estimates of the growth potential in these countries. There is little doubt that these markets will grow, even relative to GDP, but we do not believe that they can be as substantial as in the U.S. or much of Western Europe unless a number of conditions are in place. Khorana et al. (2005) discuss these conditions in great detail, and in what follows we highlight some of their findings, and give specific examples of possible improvements for the industry to thrive and grow.

The industry does not flourish unless the overall quality of the judicial system is high. Most of the time China and Russia are excluded from studies that investigate the quality of the judicial system, but it is safe to say that they would not rank high at this point. For India and Turkey, we have data on judicial system quality. Khorana et al. (2005) compute a measure of judicial quality by summing up 5 measures developed by La Porta et al. (1998): efficiency of the judicial system, rule of law, corruption, risk of expropriation, and risk of contract repudiation. Each variable is on a scale from 1 to 10, where a higher value implies better quality. The judicial score for India is 30.61 and for Turkey only 27.31. This compares to 47.61 in the U.S.,

while all countries with a well-developed fund market score above 40. We therefore believe that the growth potential in these markets is limited unless the overall quality of their legal regime improves, and we do not expect to see dramatic improvements in legal quality in the near future.

Khorana et al. (2005) also find that the industry is larger when fund initiations and fund prospectuses require regulatory approval. However, part of such an approval process is already in place in China, Russia, and Turkey, while in India both fund initiations and prospectuses require approval.

In addition, fund management companies want to be able to start new funds quickly and at low cost. Khorana et al. (2005) find that industries are larger in countries where the relative set-up cost, computed as cost to set up a fund divided by average fund size, is small, and where it takes less than 120 days to set up a fund. In particular, the effect of set-up time is dramatic. Industries are about 5 percentage points smaller relative to the size of the debt and equity market and about 16-19 percentage points smaller relative to GDP when setup time is higher than 120 days. It is unlikely that simply shortening this period, i.e. the launch window, without making any other changes will have such a dramatic effect on industry size because we believe that the start-up period/window is just a proxy for the ease of doing business. Nevertheless, allowing funds to be established faster is clearly an important step, as long as this does not affect the quality of the review process that takes place before a fund can be established. It is also important to note that this is not a necessary condition for the fund industry's success: the U.S. has one of the longest set-up times in the world at 225 days.

Finally, Khorana et al. (2005) report that the fund industry is larger in countries with more defined contribution pension plans. Thus, replacing defined benefit with defined contribution plans (or adding such plans) is one way of stimulating the development of the industry. However, we believe it will take a long time before China, Russia, or Turkey will move in that direction. In India, however, efforts to establish defined contribution plans are well under way.

In sum, we expect most of the growth in the industry to come from expansion outside of the U.S. But to reach their full potential, countries need to improve the overall quality of their judicial system, which we feel is unlikely to happen in the near future in those countries with the largest perceived growth potential.

3. How funds are sold and how much it costs

3.1. Fund distribution

There are basically three channels through which funds are sold: (a) direct sales through the fund management company; (b) sale through a financial advisor; (c) sale through a commercial bank. The third channel is really a hybrid form because the banks will provide advice to customers when asked, but this is not always the case. In addition, banks will usually only sell the funds they sponsor. The dominant type of distribution mechanism used varies by country. While in the U.S., most funds are sold through brokers and by the fund directly (see Bergstresser et al. (2006)), banks are the dominant distributors in most of Continental Europe. This is partly due to the fact that for much of the history of the fund industry, U.S. banks were prevented from offering mutual funds.

We do not expect these distribution channels to undergo dramatic changes in the future; they are well established and we expect no shifts in supply or demand for other distribution channels. It is, of course, the case that when funds are not distributed directly by the fund management company, the distributors need to be compensated. These fees either have to be compensated indirectly via superior performance or directly via reductions in other fees. However, this does not appear to be the case, at least not in the U.S. Bergstresser et al. (2006) make a careful comparison between funds sold through intermediaries and funds sold directly. They fail to uncover any meaningful benefits from the use of financial advisors. In particular, they find that funds sold through intermediaries have higher non-distribution related fees and inferior risk-adjusted performance. Notwithstanding these facts, we believe that intermediaries

will remain important in the fund distribution process because potential customers are simply not fully informed about the costs and benefits of fund investing and are not fully aware that cheaper distribution options are available. We will discuss these issues in more detail in Section 4 where we analyze consumer behaviour.

3.2. Cross-country sales

Some countries have essentially closed economies for funds, which implies that only funds established in a particular country are offered for sale in that country, but not offered for sale in other countries. Australia, Canada, Japan, and the U.S. conform to this description. In the European Union, on the other hand, funds can be sold across countries with relatively ease, mainly because regulation was developed allowing it to happen. As we alluded to earlier, much of the cross-border selling in the E.U. originates from Luxembourg and Ireland, while the cross-border sales from other E.U. countries are limited. In addition, a limited number of funds have been established in tax havens, such as the Bermuda, the Caymans Islands, and the Channel Islands (Jersey, Guernsey, Isle of Man) and are offered for sale in select European countries. Khorana et al. (2007) study more than 45,000 funds offered for sale in 18 countries in 2002 (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland, U.K., U.S.). Around 54% of these funds are offered for sale in the country in which they are domiciled; 42% are domiciled either in Luxembourg, Ireland, or one of the tax havens, and only 4% are domiciled in another European country.

We do not expect to see dramatic changes in these patterns, but we do offer some thoughts about the future:

- Cross-border sales will remain limited to Europe and some of Asia (via Hong Kong).

We do not expect the U.S. or Canada to open their markets to foreign funds. This

does not imply that foreign fund managers cannot sell funds in these countries, but to do so, they will have to set up operations in these countries.

- Even in Europe, cross-border sales will decline in importance, and particularly sales from locations other than Luxembourg and Dublin will suffer. The reason is that part of the attractiveness of funds from Luxembourg and other tax heavens came from their ability to keep ownership and income from these funds concealed from tax authorities. As European legislation is being changed, it will become more difficult to do so, thereby reducing the benefit from fund sales from all of these countries. Luxembourg and Dublin will suffer to a lesser degree because they continue to benefit from E.U. legislation permitting cross-border sales and because they are now well established fund hubs.
- Luxembourg's dominance over Ireland is likely to increase going forward. Of the two pan-European fund hubs, Luxembourg has always been larger; in 2002, there were 7,748 fund classes domiciled in Luxembourg and only 1,279 in Dublin. This is partly the case because Luxembourg was the first market acting as a hub for cross-border sales, partly due to its strict bank secrecy laws. Ireland only became an entrant relatively recently through the establishment of the Dublin International Financial Services Centre. Fund management companies that set up shop in Dublin were given tax breaks to do so, fuelling its dramatic growth. However, these tax advantages have now expired, and since most of the critical mass for cross-border funds is still in Luxembourg, we have no reason to believe that the strong growth in Dublin will continue.

3.3. What does it cost to own a fund?

Investors have to pay a variety of fees when purchasing mutual funds. Broadly speaking, there are two types of fees: (a) one time fees that are paid when entering and/or leaving the

fund; and (b) those paid on an annual basis. One can further divide the annual recurring fees into two subsets: (a) the management fees and (b) all other expenses. Management fees are the revenues of the fund management company. They are used to pay the salaries for investment managers and other management company operating expenses, including advertising expenditures. Management fees sometimes follow a sliding scale, where fees decline as the amount of assets under management increases. The other expenses are direct expenses borne by the fund, such as transfer agent fees, custodian fees, accounting fees, and audit and legal fees. They are passed on to the fund investors, but do not accrue to the management company. In addition, in some countries, such as the U.S., fund management companies are allowed to include a separate charge for distribution (called 12b-1 fee in the U.S.). These fees are used by the fund management company as payment for the sales, marketing, and advertising efforts of the fund. In practice, most, if not all, of these fees are employed to compensate the financial advisors selling the fund.

Fees levied for entering the fund (front-end loads) and exiting the fund (back-end loads) accrue to the fund management company, but they can also be used as compensation for the advisors selling the funds. Back-end loads often follow a sliding scale, with fees declining as investors keep their money in the fund for a longer period of time.

There are substantial differences in fees charged across countries and across funds within a country. Khorana et al. (2007) document various fee levels for funds offered for sale in 18 countries at the end of 2002: 14 European countries, and Australia, Canada, Japan, and the U.S. They look at management fees, total expenses ratios and total expense ratio, combined with entry and exit fees (loads), assuming that investors remain invested in the funds for 5 years. The differences are startling. For example, for equity funds, funds offered for sale in the U.S. have the lowest value-weighted management fees (0.62%), while they are more than 3 times higher in Canada (1.96%). When adding other expenses and amortized loads, Australia has the lowest costs (1.41%), while Canada remains most expensive (3.00%). These differences can

be partly explained by the fact that fund sizes differ across countries and that fees are generally negatively related to size. Similarly, there is a negative relation between fees and the size of the fund complex. However, the differences remain large even after taking into account scale and scope related factors. Various factors are related to these remaining fee differences, the most important of which is that fees are lower in countries with stronger investor protection. We do not expect to see dramatic shifts in the fees being charged across countries, mainly because we do not expect to see dramatic shifts in the underlying factors driving the fees.

There are some specific pressures emanating within certain countries, however. In Canada, the press has been particularly vocal about the findings work by Khorana et al. (2007), showing that Canada is the most expensive country in the world for fund investors. Part of the reason for the high expenses is that distribution costs are high: the vast majority of funds in Canada are sold through advisors who need to be compensated. But, as pointed out above, management fees are high as well. The response from the Canadian fund industry (Investment Institute of Canada - IFIC) has been that investors have a preference for fund advisors; they also presents arguments questioning the reliability of the research; however Khorana et al.'s (2005) response to these arguments indicates that IFIC's criticisms have little or not merit. Despite the fund industry's response, some Canadian funds have started lowering their fees recently. We expect to see a further modest decline in the future.

In the U.S., fee levels are quite modest when placed in an international context. Nevertheless, there has been substantial criticism about fee levels, partly due to work by Freeman and Brown (2001). These authors compare mutual fund fees to pension fund fees and argue that they while they should be similar, mutual fund fees are much higher. Freeman (2004) has testified about this work in Congress and the Office of the Attorney General of New York State (2004) has made statements supporting these arguments. At heart of the matter is the failure of fund management companies to pass along economies of scale in fund management to the investor. These allegations have been followed by a spate of lawsuit against fund

management companies, but up to this point, most cases have been dismissed in summary judgement. These cases have been filed under Section 36(b) of the Investment Company Act claiming that fund advisors reap significant economies of scale with an increase in assets under management and these savings are not adequately passed on to fund shareholders. In the legendary 36(b) case, *Gartenberg versus Merrill Lynch Asset Management*, the courts ruled that in order to violate section 36(b), the “advisor must charge a fees that is so disproportionately large that it bears no reasonable relationship to the services rendered and could not have been the product of arm’s length bargaining.” The dismissal of a number of these cases in U.S. courts has been made on the grounds that plaintiffs have failed to establish material facts in support of their arguments. Some cases have gone to trial, however, and we believe that there may be some downward pressure on fees in the future if the plaintiffs are successful.

As mentioned earlier, there are also substantial fee differences within countries for similar type funds. Table 2 contains selected numbers from Hortacsu and Syverson (2004) who study fee differences for U.S. funds in 2000, with a particular focus on S&P 500 index funds. What stands out from this table is the wide dispersion in expenses for similar fund types. The ratio of the 75th percentile of the distribution of fund fees relative to the 25th percentile is at least 2 for all sectors listed in the table, while the ratio of the 90th to the 10th percentile exceeds 3, and is as high as 8.2 for S&P500 index funds. Hortacsu and Syverson (2004) also present two other interesting facts about S&P500 index funds. First, the weighted-average fee for these funds has actually increased over the period 1995-2000 from 26.8 basis points to 32.2 basis points. Second, the market share of the funds in the lowest cost quartile declined over this period from 86% to 75%, while the market share of the funds in the highest cost quartile increased from 1.4% to 4.1%. How is this possible, especially given that information technology has improved over time thereby reducing search costs? Hortacsu and Syverson (2004) argue that three factors can explain this behaviour. First, while search costs have decreased for the average investor, they have actually increased for the marginal investor because more first-time

investors have entered the mutual fund market. Second, switching costs are important and investors like to retain assets in funds managed by the same fund management company. Third, investors value aspects other than performance, such as responsiveness to queries. Their empirical work supports this view. Elton, et al. (2004) also study S&P500 index funds; they too note the large differences in fees charged by various funds. While they discuss rational explanations for the survival of high-cost index funds, they also entertain the possibility that this is only possible if investors are irrational. In Section 5, we will discuss investor behavior in more detail and describe how fund management companies can benefit from this behavior.

There is one final cost element which we have not discussed at this point: performance (incentive) fees. These are fees charged when performance exceeds certain pre-specified benchmarks. They are not very common in the U.S. because since 1970, the fees have to be symmetric (fulcrum fees). This implies that the fund management company has to reduce fees for underperformance to the same extent as it increases fees for outperformance. Elton et al. (2003) study incentive fees in the U.S. mutual fund industry and find that in 1999 only 1.7% of all funds charged incentive fees. However, these funds control 10.5% of all fund assets. Surprisingly, however, these funds do not earn any incentive fees, on average, because they do not outperform their benchmarks. In Europe, such funds are much more common, because their fees can be asymmetric, implying that funds receive extra remuneration for outperformance, but do not have to pay for underperformance. Sigurdsson (2007) reports that 12% of European equity funds have such a structure, and that funds take various actions to maximize the value of these performance fees.

We do not expect to see significant growth in the importance in performance fees in the U.S., given their symmetric nature. However, we believe that there is room for growth of these funds in Europe because they may allow fund managers to receive compensation in a manner that appears to have the best interests of fund investors at heart.

The above discussion focuses on the fees charged on all types of funds and index funds specifically. The next section contains a more detailed discussion on other types of funds, and we postpone a discussion of their fees until we have described the funds' features in more detail.

4. New fund types

Mutual funds invest in all types of assets. In this section, we highlight specific fund types which have grown in importance over the past decade or so, and provide some thoughts about the future importance of these funds in the industry.

Index funds. These funds mimic the performance of an underlying index. Column (ii) of Table 3 shows that index funds make up a modest fraction of all funds offered in a number of countries. They are most popular in Japan with 6.3% of all funds offered being index funds, and least popular in Norway, where only 0.3% of all funds are index funds. It is of course possible that there are relatively few funds, but that they make up a large fraction of fund assets. However, this is not the case (as illustrated in column (iii)). In fact, there are only three countries where the importance of index funds increases when we weigh them by size. These are Finland, Japan, and the U.S. We expect further (but limited) growth of the index sector in the U.S., based on three factors: (a) information on the advantages of indexing is becoming more widely available; (b) fewer investors are novices; (c) a number of major players in the fund industry have reduced the management fees on their index funds. Our sense is that index funds will also gain in importance in Europe as potential investors become more informed about the benefits of indexing. However, another type of funds has emerged in Europe, which shares some of the features of index funds. These are guaranteed funds, which we discuss next.

Guaranteed funds. Guaranteed funds are typically funds established with a limited life and the promise of a capital guarantee if held for that period. For example, a fund may have been established in 2001 with a 5-year life span. It guarantees investors that they will fully participate in the increase in value of the underlying index, but if the index drops below the

initial/starting level, investors will receive their original investment without any loss of principal. Such strategy is financed by investing in zero coupon bonds, combined with options on the index. Given that the returns often do not include the dividends received on the index, such a strategy can easily be executed with the funds received at the commencement of a fund's operations. A variation on the guaranteed funds is the so-called click fund. Such funds not only provide capital guarantees, but they will also click in gains if they exceed a certain threshold. For example, if the underlying stock index increases by 20% over the life of the fund, these gains will be 'clicked-in' and investors will not lose these capital gains under any circumstances. As illustrated in column (v) of Table 3, these funds are extremely popular in certain European countries, Belgium and Spain in particular. Our sense is that their popularity will increase because the capital guarantee makes for an easy marketing tool. In addition, Khorana et al. (2007) also find that guaranteed funds charge lower fees than other funds in the same investment objective; total shareholder costs, which include annualized loads are about 15 basis points lower for guaranteed funds. This may also appeal to investors. However, guaranteed funds are much more expensive than index funds, while they often just mimic the performance of the underlying index. Thus, pointing out the right fee differential requires some clever marketing, but can lead to lucrative opportunities for fund management companies.

Sector funds. These are funds that specialize in a particular sector of the economy and invest almost exclusively in equities. They are also very popular. Column (vi) Table 3 shows that these specialty funds make up about 10% or more of all equity funds in most countries, with a low of 7.4% in the U.K. and a high of 22% in the Netherlands. Khorana and Nelling (1997) document that sector funds perform as well as other diversified equity funds and are not any riskier than small-cap or aggressive growth funds. Overall, they conclude that sector funds have a role to play in an investor's overall portfolio. We believe that such funds will maintain their popularity going forward and will be used as a portfolio optimization tool for sophisticated retail investors.

Funds of funds. These are mutual funds that invest in other funds; most of the time these other funds are mutual funds as well, but they could also be hedge funds. We know very little about these investment vehicles, but as illustrated in column (iv) of Table 3, they are quite prominent in some countries, and we believe that they deserve further study. Khorana et al. (2007) report that these funds are substantially cheaper than regular funds in the same objective, but it is important to be cognizant of the fact that the underlying funds are already paying management fees as well. Given the dual layer of fees levied, we are actually surprised by their success. One possibility is that fund investors are less aware of the embedded layer of fees. Without further study, it is difficult to make predictions regarding the future success of these investment vehicles.

Hedged mutual funds. These are mutual funds that follow strategies similar to those followed by hedge funds. As hedge funds follow a variety of styles, identifying them is not straightforward. Using a variety of search methods, Agarwal et al. (2007) identify 46 U.S. mutual funds that follow hedge fund strategies. They do not find that these funds perform particularly well relative to traditional mutual funds or hedge funds, but have higher expenses. Nevertheless, we believe that these types of funds will continue to grow in importance as retail investors seek exposure to hedge fund type strategies in pursuit of enhanced returns.

5. The behaviour of fund investors

Mutual funds should not be different from any other product in that consumers will tend to choose products that maximize their utility. But this is where the comparison ends. While it is the case that funds come with certain attributes that affect the perceived benefits (including the services provided by the fund management group, such as record keeping), we believe that the key driver of consumer choice should be a fund's expected risk-adjusted return. This return should be computed after management fees and other expenses, and, ideally, should also take into account the tax consequences for fund investors.

There is serious doubt as to whether fund investors behave this way. Below is a summary of some stylized facts regarding consumer behavior in the fund industry, together with an assessment under which circumstances, if any, such behavior could be rational. We then study the implications of this behaviour for fund management companies today and in the future.

5.1. Consumer behavior

Chasing winners. Funds that have performed well in the past realize large inflows. This is particularly the case for star funds, i.e., those funds that realize the highest performance levels. In fact, we are almost faced with a winner-takes-all phenomenon: the best fund gets all the money [see, for example, Sirri and Tufano (1998)].

Is such behaviour rational? There are three possible scenarios under which it may be. First, such behaviour could be rational if excess performance persists (hot hands). However, there has been relatively little evidence in the literature to support the hot hands phenomenon. The most influential paper in this area is by Carhart (1997), who demonstrates that there is virtually no evidence of persistence in fund returns after controlling for a variety of risk factors. The one exception in his research is among poorly performing funds; that is, poor performance persists. More recently, there has been some work suggesting that certain fund and managers characteristics are associated with excess performance; we will defer a discussion of this literature and its implications to Section 6.

Second, better performing funds may receive more media attention, which reduces search costs for fund investors. However, Sirri and Tufano (1998) find little evidence that this is the case. While media attention is correlated with fund flows, their evidence does not support the notion that media attention drives flows or that flows are larger for better performing funds that have received a lot of media attention. Of course, there may be other ways to attract consumers' attention. Funds that charge high fees may be able to employ those fees in advertising, thereby reducing the search costs for investors. Sirri and Tufano's (1998) evidence

is consistent with this conjecture: the flow-performance relationship is particularly strong for high-fee funds.

Third, even without hot hands or search costs, chasing winners could still be rational. We gain this valuable insight from Berk and Green (2004), who develop a model of the fund industry that is consistent with a number of stylized facts in the industry. Their key assumption is the fund managers are able to earn excess returns, but that there are diseconomies of scale to investing. Thus, as managers attract more funds, their ability to deliver excess performance declines. Investors learn about managerial ability by observing past returns. Those funds that have high past returns attract additional funds, but, as a result of the additional inflows, diseconomies of scale prevent the fund managers from delivering this superior performance on a consistent basis. This is certainly a possible line of reasoning, but we are concerned about a number of other implications. When calibrating their model, Berk and Green find that if managers' funds were expanding upon initial good performance their excess returns would have to be 6.5% before fees on the first dollars invested and 5% after assumed management fees of 1.5%. We find this number to be quite high, but we are cognizant that others may have different opinions.

Fund investors do not only chase winners, they also focus their attention on external certification of performance by Morningstar. Morningstar rates virtually every fund in existence in the U.S. and in many other markets. It assigns a star ranking from 1 to 5 stars based on 3-year, 5-year, and 10-year risk-adjusted performance. Del Guercio and Tkac (2007) show that these ratings have a substantial impact on subsequent inflows and that this effect is not subsumed by returns. Khorana and Servaes (2007) find that family market share is positively related to Morningstar ratings and that this effect is stronger than the effect of performance. Is it rational on the part of fund investors to chase Morningstar rankings? It is if we believe that such ratings have a substantial impact on search costs, but further research is required to investigate this possibility.

Overall, we find the winner chasing behavior of consumers in the fund industry somewhat puzzling. While search costs or managerial skill combined with economies of scale may explain some of this behavior, we are reluctant to support this conclusion. In particular, we feel that the search cost have to be extremely high to justify search-cost based arguments.

Failure to withdraw funds from poorly performing funds. As we just discussed, poor performance persists, and it is therefore surprising that investors fail to withdraw their money from these funds. Berk and Tonks (2007) do report that poorly performing funds face substantial withdrawals if performance is only poor for one year, but that the flow-performance sensitivity declines substantially for funds that continue performing poorly. They argue that many investors *do* leave poorly performing funds, but, after those investors have left the fund, we are left with investors who are less sensitive to poor performance. But why is this the case? It does not appear rational on the part of investors. Are these investors not aware of other options available or are these investors who do not pay attention to what happens to their funds? Either way, we do not believe that such behavior is rational.

Failure to choose among the best options. In section 3, we already discussed the large variation in fund fees within investment objectives in the U.S., even for a very homogeneous fund category such as S&P500 index funds. At that point, we mentioned three possible explanations for such behaviour: (a) search costs; (b) aspects of product differentiation; and (c) irrationality. While we feel that the first two arguments are difficult to rule out in practice, Choi et al. (2006) conduct an experiment which diminished the importance of the first two possibilities. Wharton MBA students and students from Harvard College are asked to allocate funds across 4 S&P500 index funds. When just provided with a prospectus (where fees are disclosed), 95% of the students fail to minimize fees. Of course, these students still have to incur search costs to find the fees in the prospectus. However, even when the students are provided with a summary

statement of fees, thereby eliminating search, 85% still fail to minimize fees. Finally, when students are provided with data on the return on the fund since its inception, a piece of information which is completely irrelevant, students actually chase funds with the best performance. Choi et al. (2006) conclude that search costs alone cannot explain investor behavior and that investors appear to value some other fund attributes, other than services provided by the fund management company.

Not all fees are treated equally. At least two articles suggest that investors treat different types of fees differently. Barber et al. (2005) argue that investors pay more attention to fees that are more apparent, such as front-end loads, and not to annual expenses. In support, they find that mutual fund flows are negatively related to front-end loads, but not to annual expenses. When they subdivide expenses into regular operating expenses and marketing expenses (so called 12b-1 fees), they find that investors are less likely to buy funds with high operating expenses, but more likely to buy funds with high marketing expenses. Given that operating expenses do have a negative effect on fund flows, this result does not fully support their argument. All it really says is that the marketing effort pays off. Khorana and Servaes (2007) study market share of fund families. They find a positive relationship between loads and market share, a negative relationship between operating expenses and market share, and no relationship between 12b-1 fees and market share. Their interpretation is that loads are paid to financial advisors for selling funds and that a larger selling effort helps. Operating expenses, on the other hand, reflect the price paid for the service and funds that charge a higher price are smaller. However, if some of these fee are explicitly used for marketing (12b-1 fees), they counterbalance this effect. Thus, while all fees ultimately affect net return in a similar way, those fees that are employed in sales efforts do not reduce the size of the fund management company.

Asymmetric response to fee changes. Khorana and Servaes (2007) study the effect of changes in fund management company expenses on their market share in the U.S. mutual fund industry. They find that firms that reduce expenses gain market share for the sample as a whole, and that funds that increase expenses lose market share. However, this result only applies to fund families with above average expenses. For funds with below-average expenses, changing fees does not affect market share, as long as fees remain below average. This asymmetric response can certainly be exploited by fund families.

5.2. Fund family response

If consumers are irrational, funds and the families that sponsor them can exploit this behavior. In this section we summarize some of the actions they can take.

Promote and create top funds. Given that winning funds attract a disproportionate amount of all new money invested in the industry, it is important for funds families to create and promote such funds. Promotion implies spending money on advertising and sales efforts. As Sirri and Tufano (1998) demonstrate, the flow-performance relationship is particularly strong for high-fee funds. Funds should exercise care, however. While this relationship does hold for high-fee funds, it is not obvious that star funds could simply increase their fees in the future. The alternative to promotion is the creation of top funds. Fund families have a number of methods at their disposal to do so. First, they can start many funds at the same time so that, just by luck, one of them will turn out to be an excellent performer. The funds that turn out to perform poorly can be closed down or merged out of existence by merging them into another fund. The surviving fund is able to use its own performance track record in promotion. Second, families may be able to subsidize the performance of some funds at the expense to others. Gaspar et al. (2006) show that this is possible through preferential IPO allocations and trading among funds in the family, and that this is particularly relevant for high performance and high-fee funds.

Take advantage of consumer's treatment of fees. There are many actions funds families can take to benefit from consumers' failure to consider all fee aspects. First, given the lack of sensitivity between fees and market share for low-cost fund families, such families should consider increasing their fees across the board, as long as they remain below average. Second, fund families should also start new funds that are clones of older funds, but with higher management fees [Khorana and Servaes (1999)]. Third, funds that have performed poorly and have seen all the smart money leaving the fund should consider raising their fees, as the remaining investors are not sensitive to fee changes. Fourth, in countries where performance fees are allowed to be asymmetric, we believe that introducing performance fees provides an additional means through which revenues can be increased.

Cash in on risk aversion. Funds that provide a capital guarantee are relatively easy to manage, mainly because they often follow an indexed approach. While the fees on such funds are generally lower than fees for actively managed funds, they are higher than for index funds, and fund families can start these types of funds to increase fee income. Clicking in gains achieved after a certain period of time may also help.

6. Governance

Mutual funds in general and fund boards in particular have come under increased scrutiny in the U.S., particularly in light of late trading and market timing irregularities which have surfaced at a small number of funds over the past few years. The effectiveness of the fund board in managing potentially divergent objectives of the fund advisors and shareholders has come in question since some believe that the actions of fund boards are influenced by the investment advisor.

As mentioned earlier, one outcome of this adverse publicity has been shareholder lawsuits claiming that fund fees in the U.S. are excessive; however, the cross-country study of fees by Khorana et al. (2007) documents that fund fees in the U.S. are some of the lowest in the world. Regardless, since fee setting is an important part of the negotiations where the board plays a vital role, board effectiveness is being examined more closely. The Securities and Exchange Commission in the U.S. has initiated new rules affecting the composition of the fund board. New rules require fund boards to increase the proportion of independent directors from 50% to 75% and place an outside chairperson on the fund's board. These new rules are being actively debated by the industry and regulators.

While this is a very U.S. centric view of the industry, this debate had raised a fundamental issue with regard to the role and effectiveness of fund boards in general. Some question whether fund boards are even needed since the external market forces can substitute for board regulation and oversight by allocating capital to better performing (net of fees) fund complexes. In markets around the world, where investors are generally more capable of making rational capital allocation decisions, some would suggest that doing away with fund boards is a plausible scenario; however, others argue that small investors do indeed need the protection which might emanate from well functioning mutual fund boards.

There is some empirical evidence in the U.S. on how board structure influences a variety of outcomes - which fund boards are entrusted with – including fee negotiations and approval of fund mergers. Tufano and Sevick (1997) document that those funds with a greater proportion of independent directors levy lower fees and Khorana et al. (2007) find that more independent boards are quicker to arrest a fund's underperformance by initiating a fund merger. However, they do not find any evidence to suggest that the presence of an independent chair – a hotly debated issue – makes the board more effective. These papers do shed some light into how board structure and director ownership levels may affect board effectiveness.

In light of some of this evidence, it is unlikely that mutual fund boards are going to become redundant any time in the near future, at least in the U.S. Regulation and disclosure rules will be modified to make fund boards an important shareholder protection mechanism both in the U.S. and around the world.

7. Improvements in assessing skill and what it means to investors

7.1. Fund return predictability

As discussed in section 4, until the start of this century there was a relatively broad consensus that funds cannot systematically earn positive risk-adjusted returns after taking into account the fees they charge. In addition, fund and fund manager characteristics are not related to performance. This consensus view no longer holds. In what follows we will discuss some recent findings on the determinants of excess performance and what this means for investors. We want to emphasize though that further research is required to verify whether these findings are robust.

One of the first papers to challenge the consensus view is Chevalier and Ellison (1999). They find that various fund manager characteristics, such as age and whether the manager holds an MBA are related to performance. A lot of these effects disappear after properly controlling for risk and expenses, but one survives: there is a positive relationship between the average SAT scores of students in the universities attended by the fund managers and performance.

More recently, Khorana et al. (2007) have documented a positive relationship between the amount of personal wealth invested by fund managers in the funds they manage and subsequent performance. Using new disclosure requirements imposed on U.S. funds by the Securities and Exchange Commission, they study the 2005 performance of all funds with manager ownership available as of December 2004. This sample covers more than 1300 funds. They find that the average manager's investment in their funds is quite modest (about \$97,000),

but nevertheless uncover a strong positive relationship between the fraction of fund assets owned by the manager and subsequent performance: for every percentage point of fund assets owned by fund managers, risk-adjusted performance increases by about 3 percentage points. They suggest that this effect is due to the incentives created by managerial ownership to work harder at beating the market, but they acknowledge that it could also be information based. That is, managers buy more shares in their funds because they know the funds will outperform. Either way, this information is useful for investors in making portfolio allocation decisions. Along similar lines, Cremers et al. (2006) find a positive relation between fund performance and the ownership stake of the directors of the fund.

The previous articles focus on managerial characteristics. Recent work also studies fund characteristics and fund family characteristics. Chen et al. (2004) find an inverse relation between fund size and returns, but a positive relation between family size and returns. The negative effect is most pronounced in small stocks, suggesting that liquidity may be an important driver of the relationship. But they argue that organizational diseconomies related to hierarchy costs are also important; that is why the diseconomies do not manifest themselves at the family level.

Another line of research focuses on the actual portfolio composition of the funds, which only needs to be disclosed in the U.S. One of the first contributions in this area is by Cohen, et al. (2005). Cohen et al. (2005) study whether the portfolio holdings of a manager match those of successful managers – the more they match, the more skilled the manager is in picking stocks. More importantly, they find that this measure cannot only be used to assess skill, but also to predict future performance: subsequent returns of managers in the best performance quintile are between 2.4% to 4.4% higher per year than the returns of those in the worst quintile. Kacperczyk et al. (2005) study industry concentration of actively managed U.S. funds and find that more concentrated funds perform better, after controlling for risk, suggesting that managers with a more concentrated portfolio are more skilled. Kacperczyk et al. (2006) use portfolio

disclosure to compute the following statistic: the return on the fund, minus the return the fund would have earned if it had not changed its portfolio composition since it was last disclosed. This return gap captures unobservable actions by funds. Kacperczyk et al. (2006) find that this return gap predicts future fund performance: the decile portfolio with the highest return gap outperforms the market by 1.2% per year, while the portfolio with the lowest gap generates a market-adjusted return of -2.2%. Finally, Cremers and Petajisto (2007) develop a new measure of portfolio management, called Active Share. This captures the extent to which the portfolio weights deviate from the index against which fund performance is measured. Funds with a low active share are really closet indexers; i.e., they claim to be actively managed, but just hold the underlying index. Cremers and Petajisto find that this measure of active management is positively related to performance: those funds with the highest Active Share pick portfolios that outperform their benchmarks by approximately 1.5% per year after taking into account fees and transaction costs.

Cohen et al. (2007) take this portfolio holdings approach a step further. They develop a trading strategy, based on the portfolio holdings of mutual funds, a strategy that does not require investment in the funds themselves. This strategy is based on an extensive study of the education networks of fund managers and corporate board members. Investing on these connected stocks yields excess returns up to 8.5% per year.

7.2. Implications for investors

What do these findings imply for fund investors? It depends on whether they have access to this information and what they do with it. We believe that three distinct groups of investors are emerging. First, *naïve investors*. These are investors who are poorly informed about fund availability and about what it costs to invest in funds, and who have no insight into the work on predictability of returns. Instead of buying funds, they are 'sold' funds, often load funds, sold through financial advisors. In addition to the loads, such funds also charge hefty

management fees, which have an obvious negative effect on fund performance. These investors also exhibit the strongest behavioral traits: they chase past performance, they do not fully consider the impact of fees on performance and they are most easily convinced by advertising. They also show most interest in guaranteed funds and click funds and they can be convinced that performance fees are a necessary ingredient to motivate managers. They also stay behind when smarter money has left the fund. While these investors are important for the profitability of the fund management industry, they are in the minority, and as information becomes even more available, we expect a modest decline in their importance in the future.

Second, *informed investors*. These investors have taken more time to become informed about the various options available and they also have a better understanding of finance and financial markets; fees are a key determinant in their decision making, but they can still be convinced that performance persists, without studying the drivers of this persistence. They often allocate some of their money to index funds, while the remainder is actively managed. When performance deteriorates, they reallocate their capital. They are attracted by the promises of high returns on hedge funds, but are not fully aware that the high management and performance fee charged in that sector may compromise performance. They find hedged mutual funds an attractive investment option, but know little about them because as a sector it is too small. The success of the hedged mutual fund sector depends very much on the performance of the first few entrants which is poor at this point. We believe that the majority of investors fall into this category. They are not aware of the research findings presented in the previous subsection.

Third, *smart investors*. These investors are more up to date on the latest research and thinking in fund management and performance assessment, in particular. They can be further subdivided into two groups. *Smart investors with modest wealth*. These investors will remain invested in mutual funds. Part of their money will be invested in the cheapest index funds available. The remainder will be allocated based on the most recent research metrics on fund

return predictability. *Smart investors with substantial wealth* will either follow a do-it-yourself approach or use private bankers that do so. The idea is to skip the mutual fund industry all together, if possible, and to allocate money to investment strategies followed by successful funds. Of course, some strategies rely on fund manager traits or unobservable fund actions, and they will still require fund investment.

There is some evidence that new money being invested is indeed smart. Gruber (1996) finds that the returns earned by newly-invested money in actively managed funds is higher than the average return earned by investors in these funds, suggesting that new money is smart. However, Zheng (1999) disputes this finding using a larger sample. Of course, this evidence pre-dates a lot of research on return predictability and conducting a study on the performance of new money invested in the funds industry today would be a worthwhile undertaking.

8. Consolidation in the fund industry and implication for fund investors

Across the world and within each country, there are a large number of companies that offer mutual funds. Khorana and Servaes (2007) report that there were 525 mutual fund 'families' offering funds for sale in the U.S. in 1998, up from only 167 in 1979. This is not surprising in light of the tremendous growth experienced by the industry in the U.S. What is perhaps more surprising is that the fraction of the mutual fund assets managed by the top five families has not declined at all. Khorana and Servaes (2007) report that the top 5 families managed 31% of total assets in 1979 and 1980 and 37% in 1998. For 2002, this figure is 34%, based on Morningstar data. This evidence attests to the success of large fund families in the U.S., such as Fidelity and Vanguard. The remaining stake of the market gets divided up into smaller pieces as new fund families enter. This phenomenon is not unique to the U.S. Table 4 shows the fraction of fund assets controlled by the 3 and 5 largest fund families in 17 countries, based on data from Morningstar and Lipper Fitzrovia. These figures are based on funds offered for sale in a country, which we believe is the proper definition, rather than funds domiciled in

that country. The concentration ratios are very high, ranging from 18% in France to 54% in Finland for the 3-firm concentration ratio and 26% in France to 70% in Finland for the 5-firm concentration ratio.

While it is very difficult to study the actual profitability of mutual fund operations [see Huberman (2007)], we believe that it is safe to assume that size is a critical driver of efficiency. However, given that concentration ratios are already extremely high, we do not expect much consolidation to happen at the national level. Instead, we expect the large players to maintain their positions and do not expect concentration at the national level to increase dramatically.

There has been substantial consolidation internationally, however. For example, when we study the 10 largest asset managers domiciled in the 17 countries listed in Table 4, we find that Deutsche Bank and Fidelity enter the list in 5 countries, and Axa, Citigroup, DGZ-Dekabank, Fortis, and Nordea enter the list in 3 countries. Much of this consolidation has come through acquisition, although some firms have grown abroad by starting new operations in a country. We believe that it will be virtually impossible to enter a mature market as a start-up without remaining a niche player, but this is still possible in developing markets. In addition, to enter the E.U. market, a firm only has to acquire a management company with a presence in one country to allow it to distribute funds to most member states. Luxembourg remains of key importance in this matter. Even in developing markets, we believe that acquisition may be the fastest way to establish market presence.

We do not expect fund investors to be the main beneficiary of increased consolidation in the form of lower fees. Our sense is that any improvements in efficiency will go to the management companies' bottom line.

9. Conclusion

The future of the fund industry worldwide is healthy. In many countries, the industry is still poorly developed and with the right regulatory impetus, there is room for a lot of growth:

China, India, Russia and Turkey are important in that regard. In many developed markets, the industry is quite mature, and while funds are being offered by a very large number of organizations, a large fraction of the market is captured by just a few companies. This applies to virtually all markets in North America and Western Europe. We expect to see further consolidation in the industry, not at the national level but in terms of cross-border mergers between financial institutions active in the fund industry.

We expect some pressure on fees, but not very much because a lot of investors are not fully aware of the effect of fees on performance and because fees can also be used in selling efforts. Fund families have also succeeded in differentiating their product offerings so that investors focus on elements other than fees and performance. Continued innovation in fund types will help fund families in this regard. However, sophisticated investors will continue to demand low fee products, many of them indexed. They will also use more recent developments in the work on performance persistence to identify top performing funds. It is possible, however, that increased inflows into those funds will affect this performance predictability.

There is some evidence that improved fund governance has affected decision making in some circumstances, but we would urge regulators not to impose further governance standards without a careful study of their costs and benefits. Outside the U.S., we believe that consumers would be better served by more disclosures on fees and expenses, and their effect on performance. We believe that more transparency will ultimately benefit the industry.

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Table 1
Fund Industry Size Around the World

This table lists the size of the fund industry at the end of 2001, based on Khorana et al. (2005). Only open-end mutual funds are included in the analysts. See Khorana et al. (2005) for a more detailed description of the sources employed to collect these data.

Country	Industry size	Industry / primary securities	Industry / GDP	Starting year
	(i)	(ii)	(iii)	(iv)
Algeria	0	0.000	0.000	N/A
Argentina	3,751	0.010	0.014	1960
Australia	334,016	0.378	0.934	1965
Austria	55,211	0.142	0.293	1956
Bangladesh	5	N/A	0.000	N/A
Belgium	70,313	0.099	0.306	1947
Brazil	148,189	0.213	0.295	1957
Burma	0	0.000	0.000	N/A
Canada	267,863	0.167	0.383	1932
Chile	5,090	0.042	0.077	1965
China	7,300	0.003	0.006	2001
Costa Rica	1,428	N/A	0.088	N/A
Croatia	384	0.024	0.019	1997
Czech Republic	1,778	0.041	0.031	1994
Denmark	33,831	0.075	0.209	1962
Ecuador	200	0.014	0.015	N/A
Finland	12,933	0.043	0.106	1987
France	721,973	0.212	0.550	1964
Germany	213,662	0.035	0.116	1949
Greece	23,888	0.108	0.205	1969
Hong Kong	170,073	0.203	1.051	1960
Hungary	2,260	N/A	0.044	1992
India	13,490	0.037	0.028	1964
Indonesia	764	0.007	0.005	1996
Ireland	191,840	0.823	1.856	1973
Israel	14,200	0.071	0.126	1936
Italy	359,879	0.128	0.330	1983
Japan	343,907	0.026	0.083	1965
Libya	0	0.000	0.000	N/A
Luxembourg	758,720	4.845	39.914	1959
Malaysia	10,180	0.040	0.115	1959
Mexico	31,723	0.090	0.051	1956
Morocco	4,100	N/A	0.125	N/A
Netherlands	93,580	0.059	0.246	1929
New Zealand	6,564	0.071	0.132	1960
Norway	14,752	0.060	0.090	1993
Pakistan	375	0.013	0.006	1962
Peru	680	0.024	0.013	N/A
Philippines	211	0.003	0.003	1958
Poland	2,936	0.023	0.017	1992
Portugal	16,618	0.065	0.151	1986
Romania	10	0.001	0.000	1994
Russia	297	0.002	0.001	1996
Saudi Arabia	12,105	N/A	0.068	N/A
Singapore	7,538	0.016	0.088	1959
Slovakia	165	0.013	0.008	1992
Slovenia	1,538	0.131	0.082	1992
South Africa	14,561	0.076	0.129	1965
South Korea	119,439	0.165	0.283	1969
Spain	159,899	0.101	0.275	1958
Sri Lanka	44	0.008	0.003	1992
Sweden	65,538	0.129	0.313	1958
Switzerland	75,973	0.065	0.307	1938
Taiwan	49,742	N/A	0.176	1984
Thailand	8,430	0.052	0.071	1995
Tunisia	471	0.027	0.024	1991
Turkey	3,000	0.023	0.020	1986
United Arab Emirates	0	0.000	0.000	N/A
United Kingdom	316,702	0.061	0.222	1934
United States	6,974,976	0.193	0.683	1924
Uruguay	185	0.022	0.010	N/A
Yugoslavia	0	0.000	0.000	N/A
Median (ignoring 0's, Lux, Ireland, HK)		0.048	0.088	
Mean (ignoring 0's, Lux, Ireland, HK)		0.071	0.148	

Table 2
Expenses ratios and price dispersion in the U.S. mutual fund industry.

These data are from Hortacsu and Syverson (2004) and refer to the year 2000.

Sector	Number	Average fee	75th % / 25th %	90th % / 10th %
Aggressive growth	1274	1.91%	2.0	3.1
Balance growth	472	1.64%	2.2	3.7
High-quality bonds	862	1.18%	2.5	4.9
High-yield bonds	337	1.67%	2.2	3.2
Growth and income	978	1.58%	2.5	5.5
Government securities	450	1.32%	2.5	4.7
Income	218	1.71%	2.2	3.4
Long-term growth	1812	1.79%	2.0	3.1
Retail S&P500 Index	82	0.97%	3.1	8.2

Table 3
Specific fund types by country

This table lists the fraction of specific fund types by country of sale, except for column (iii) where the fraction is based on assets. In columns (ii), (iv), (v), and (vi) the reported fraction is computed as the fraction of fund classes offered for sale in each country that are of the specific type. All data are for 2002; the figures are computed based on individual fund data provided by Morningstar, Lipper Fizzrovia, and FRC.

Country of sale	Fraction Index Funds	Fraction Indexed Assets	Fraction Funds of Funds	Fraction Guaranteed Funds	Fraction Specialty Funds
(i)	(ii)	(iii)	(iv)	(v)	(vi)
Austria	1.9%	1.2%	2.4%	0.8%	9.7%
Belgium	2.1%	1.1%	0.9%	8.7%	14.2%
Canada	5.1%	3.1%	n/a	n/a	15.5%
Finland	1.4%	1.9%	1.5%	0.0%	20.0%
France	3.1%	1.6%	8.6%	1.2%	10.0%
Germany	2.5%	1.5%	3.1%	0.6%	12.9%
Italy	1.3%	0.5%	2.7%	0.6%	14.0%
Japan	6.3%	8.8%	n/a	n/a	n/a
Luxembourg	1.8%	1.8%	2.3%	2.0%	19.0%
Netherlands	2.1%	1.7%	1.5%	1.1%	22.0%
Norway	0.3%	0.3%	3.5%	0.1%	16.0%
Spain	1.0%	0.8%	5.1%	9.8%	11.6%
Sweden	1.2%	1.1%	1.4%	0.0%	12.1%
Switzerland	1.1%	1.0%	0.6%	0.4%	9.9%
United Kingdom	1.1%	1.2%	3.1%	0.5%	7.4%
United States	3.5%	5.6%	n/a	n/a	13.0%

Table 4
Concentration in the fund industry in various countries

Market shares are computed based on funds offered for sale in a specific country (not funds domiciled in that country). All data are for 2002; the figures are computed based on individual fund data provided by Morningstar, Lipper Fizrovia, and FRC.

Country of sale	Market share of 3 largest families	Market share of 5 largest families
Australia	36%	47%
Austria	39%	46%
Belgium	29%	43%
Canada	24%	38%
Finland	54%	70%
France	18%	26%
Germany	28%	39%
Italy	24%	33%
Japan	36%	49%
Luxembourg	30%	40%
Netherlands	33%	45%
Norway	48%	63%
Spain	26%	38%
Sweden	32%	46%
Switzerland	40%	51%
United Kingdom	24%	32%
United States	28%	34%