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A Wolf In Sheep's Clothing

A study about potential closet indexing in the Swedish equity mutual fund industry

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Abstract

We measure the activity of Swedish domiciled equity mutual funds with Sweden as geographical investment universe, by calculating their active share with respect to major market indices like OMX30 GI and OMX Small Cap TR and retrieving tracking error and r-squared from Bloomberg. Afterwards we calculate the cost to investors by comparing the cost of investing in comparable explicit index funds and the cost of the closet indexers. Thus, we find that not only does the Swedish investment sector have a higher share of potential closet indexing than the comparable EU-wide ESMA report, but the cost to investors is substantial. We believe the practice of closet indexing in the Swedish sector and its prominence is of several reasons, one might be behavioural with bounded rationality and another reason could be market competition in the sense that explicit indexing is not yet popular enough in the Swedish sector to rid out closet indexing. However, there is also a dilemma active fund managers' face with index-linked investing with regards to the price premium index-linked stocks enjoy and their co-movement with their index family rather than the market itself. There are also several factors like a funds size and portfolio managers' career risk that needs to be taken into consideration as to why closet indexing exists. Our findings show that the problem of the activity in the fund industry is nuanced. However, whatever reason there may be for closet indexing, investors should always question what intrinsic value active managers give their portfolio.

Keywords: Active Share, Tracking error, Fund activity, Fees, Mutual funds, Closet indexing, Index hugging

Content

1. Introduction

In 2016 the European Securities and Markets Authority (ESMA) issued a statement about the potential finding that some European investment funds are practicing what is known as “closet indexing” or “index hugging”. This practice is when fund managers are marketing their funds as being actively managed, when in fact, they are more or less investing closely and “hugging” the benchmark or an index, thus making the fund passively managed (ESMA, 2016). This is of course problematic for retail investors and savers as the difference in fees between actively managed funds and passive funds are substantial, with actively managed funds being more expensive relative to passive. Investors might also be exposed to a different risk/return profile than expected when making the investment in the first place (ESMA, 2016).

In Sweden this finding is of particular concern, as Sweden is a country that has a relatively high share of household savings in mutual funds. With 9.2% of total household financial assets being in mutual funds, Sweden is trailing only Belgium, Spain, Italy, Luxembourg, Germany and Finland in the European Union according to OECD as of 2018. This is a topic that in Swedish context have been subject to much debate since back in 2014 when the National Shareholders’ Association (*Sveriges Aktiesparares Riksförbund*) filed a complaint to the non-judicial consumer dispute resolution (*Allmänna reklamationsnämnden/ARN*). The complaint stated that two funds issued by Robur: *Allemansfond Komplett* and *Kapitalinvest*, was allegedly not being actively managed even though they were marketed as such. The case was however dismissed.

The Swedish Financial Securities Authority (*Finansinspektionen*) issued a report in 2015 showing examples of funds that were practicing closet indexing. The description of the active funds were ones which objective was to outperform their benchmark index and described as actively managed by the fund company. However, these funds showed a low tracking error because of internal objectives within the fund company (*Finansinspektionen*, Consumer protection on the financial market, page 18), which limits the deviations of the fund with respect to the benchmark. There have however been no disciplinary measures taken place by the Swedish FSA, instead it has led to self-regulation in the Swedish fund industry.

In more recent news from the neighbouring country Norway, in 2019, the FSA criticised the

Norwegian bank DNB for closet indexing. This led to a lawsuit in which DNB was convicted of charging too high fees for three of the banks actively managed funds, forcing the bank to pay back MNOK 350 collectively to around 180 000 fund shareholders.

1.1 Purpose

The purpose of this study is to estimate whether the Swedish equity mutual fund market contains funds that can be potentially classified as closet indexers under the criteria that The European Securities and Market Authority (ESMA 2016) established in their research. Our study will however not study the whole Swedish mutual fund industry, but rather the Swedish equity fund sector with Sweden as the geographical investment universe and therefore can be benchmarked against OMX30 GI Cap index and OMX Small Cap TR Index. If potential closet indexing is found, how large is the share of potential closet indexing in the Swedish equity mutual fund sector with Sweden as the geographical investment universe? The report from ESMA called for more research to be done at a national level, which is one of the reasons for doing this paper, however due to limitations in both time and resources, we were obligated to narrow down our study to a specific sector as mentioned previously. Furthermore, this area of research has only been explored to a very limited degree, thus leaving many private investors in the dark when it comes to the phenomena of closet indexing and potentially losing them money in an unfair way. This is something we would like to, at least to some degree, help with diminishing by offering research that deepens the investor knowledge in and around closet indexing on the Swedish mutual fund market, but also open a discussion and further research on activity measures itself.

1.2 Problem definition

We believe that it is important for retail investors and savers to be aware of the practice of closet indexing in the Swedish mutual fund industry and what costs this might imply for retail investors. Therefore, we will try to examine the following issues.

- Are there any Swedish domiciled equity mutual funds with Sweden as geographical investment universe that can be potentially classified as practicing closet indexing under ESMA's criteria and if so, to what proportion?
- Compared to the EU wide report by ESMA, how does our result fare?
- What are the potential economic costs to investors?

The first question will answer if there is a practice of potential closet indexing in Swedish equity fund context when using ESMA's criteria. These criteria are used for comparability's sake so that we can in question two discuss how the results differ from the result of the statement that ESMA has issued about the extent of closet indexing on the EU wide scale. If the result does differ, the second question opens for a discussion of why this might be the case. The final question will perhaps be the one that investors will find the most intriguing. If the result of answering the two first questions shows that there is a potential that closet indexing is occurring, the answer to this question will give a closer view on the economic impact that it has on the investments made by the investors.

1.3 Limitations of the study

We limit our study by focusing on active mutual funds in the Swedish equity mutual fund market that has a geographical investment focus on Sweden. However, since there is ambiguity towards what criterion should be used to define closet indexing, this study will not provide definitive answer to what in the Swedish mutual fund investment context closet indexing should be defined as. Some scholars opt for defining closet indexing as having less than 60% of the assets being different from the benchmark, meanwhile the report from ESMA has more stringent criteria. Thus, we will only conclude that using the criteria from ESMA, there is a *potential* that these funds are index closeting. We will *not* in this study provide a definitive framework for what in the Swedish context will conclude as closet indexing, we will for the sake of simplicity and comparability to the EU wide report, use the same criteria as ESMA (2016).

2. Theoretical Framework

This section begins with explaining the phenomena "closet indexing", the central focus in this report. Then previous literature will be covered, both in the area of fund activity and the economic impact of the lacking fund management that comes with closet indexing.

2.1 What is closet indexing

Closet indexing is the practice where fund managers claim to be actively managing their mutual funds while in fact, they are ending up with a portfolio that is like that of an underlying benchmark, most often an index like S&P 500 or OMX30 (ESMA 2016). By structuring the fund in this way, the managers can take on less risk while still not severely underperforming the benchmark. This could in a way be fraudulent behaviour as the fund managers are often demanding higher fees that come with a more actively managed fund even though they do not in fact put in the effort to justify this.

2.2 Previous research on fund activity

In a statement that was issued, February 2016, by The European Securities and Markets Authority (ESMA), the problem of closet indexing in the European fund market is brought up. The report is aimed towards informing investors about this phenomenon and means to protect investors by letting them know that closet indexing is something that occurs. The issue with closet indexing is not necessarily that funds are losing investors significant amounts of money but rather that the managers are not being transparent in their Key Investor Information Documents (KIID). The lack of transparency and thereby the lack of information is preventing the investors from making their best possible investment decisions and potentially also preventing them from making the profits that they would have acquired with the correct information. By not being transparent with their investors, the managers violate the trust between the parts and the misinformation will result in:

1. Investors making investment decisions based on wrongful expectations about a more actively managed fund with higher fees while they in practice will receive a less active fund with the same high fee.
2. Investors being exposed to a different risk/return ratio than expected.

ESMA carried out their research on funds that stated themselves as actively managed funds and fulfilled the three following criteria;

1. assets under management of more than € 50mn
2. an inception date before 1 January 2005
3. management fees of more than 0.65% of the net asset value (NAV) of the fund

ESMA then used the model that is described in section 3.1 in this paper, to filter out the funds that could be seen as potential closet indexers. It was found that with the use of the least strict criteria, 15% of the funds in the research could be potentially engaging in the practice of closet indexing. When using the second most strict criteria this number decreased to 7% and when using the strictest criteria, 5% of the funds fell under the radar of potential closet indexers. ESMA (2016) was also clear with stating that this is not by any means a definitive way to know if a fund is closet indexing and that the research must be followed up by a closer look at the funds by a national competent authority.

Cremers and Petajisto (2009) conducted research regarding how one could measure a funds activity. They found that only including tracking error as a form of activity measurement would be misleading as there are active managers who make active sector bets or factor bets, thus being closely linked to a benchmark or index while still being an active portfolio manager. Therefore, Cremers and Petajisto (2009) introduced the concept of active share. In combination with tracking error, active share made it more reasonable to conclude what is and what is not a closet indexing fund. Furthermore, this combination of metrics makes it clearer whether a portfolio manager is a concentrated stock picker, diversified stock picker, making sector bets or is a closet indexer. Whereas having a low tracking error, combined with a low active share, might indicate that closet indexing is being practiced. Moreover, the study concludes that while funds that have a *low* active share *underperform* their benchmark after expenses, funds with *high* active share *outperform* their benchmark before and after expenses. However, active management with respect to only tracking error does not predict higher returns. The study also found strong evidence that funds with the highest active share consistently outperformed, even after controlling for momentum. Thus, one should choose a fund with a high active share to increase one's chances of harvesting higher returns, net fees.

Petajisto (2013), who's study builds upon Cremers & Petajisto (2009), also showed that a majority of actively managed mutual funds are underperforming their benchmark after fees, while those who had a very high active share consistently outperformed their benchmark after fees. A negative correlation between size and performance was also found, not because of size itself being bad, but because of the correlation with lower activity that comes with it. Thus, smaller funds which had a higher level of activity, also performed better than the bigger funds. Furthermore Petajisto (2013) concluded that closet indexers at best only mimic the performance of a benchmark and that, net fees they underperformed. Closet indexers in this

study was identified as those with an active share of less than 60%. Thus, drawing the conclusion that that an investor should pick the mutual funds with only a very high active share or opt for explicit index investing to avoid management fees and maximise the investment.

Another interesting perspective by Petajisto (2013) is the fact that active funds, and more so closet indexers, are much more expensive than at first glance. Since the actual product the investor is buying when investing in an active fund is the managers ability to take active positions, therefore investors are really paying for the active share of the fund. Otherwise the investor might as well invest in an explicit index fund. Petajisto (2013) exemplifies this with arguing that a active fund with only an active share of 33% that charges 1.5% annual fee, is in actuality charging an annual fee of 4.5%. This, since the investor is in a sense only paying for the active positions.[1]

When studying the effect of closet indexing, its economic impact to investors and as to why we care about fees and the level of activity in Sweden, we observe the findings of Cremers, Ferreira, Matos and Starks (2016). In this paper, which tested the activity on the mutual fund markets of 32 countries, it was found that mutual funds had to increase their active share and lower their fees to be able to compete when the fund market contained more explicit indexing, i.e. index funds. Mutual funds had to differentiate themselves from the index funds and thus, pursuing a higher active share and/or lower the fees was the solution because of the growth of low-cost index funds in the mutual fund market. Furthermore, it was observed that in countries with a lower share of explicit index funds, consequently leaving investors with less of an option to choose low-cost index funds, active managers exhibited underperformance, higher fees and a lower active share. This not only reinforces Cremers and Petajisto (2009) conclusion that higher active share has a causal relationship with higher returns, net fees, but also that there seems to be a causal relationship between the increase of explicit indexing and increase in activity for actively managed funds. This has the implication that increased competition and viewing passively managed funds as a substitute to actively managed funds, has a positive effect on the asset management industry (Cremers et al. 2016).

[1] The calculation is made by multiplying the annual fee by the same amount it would take to reach 100% active share (1.5% * 3 = 4.5%, i.e. 33% * 3 = 100%)

In their study, Cremers et al. (2016) found that approximately 56% of the Swedish mutual fund market (market share % of total net assets) is closet indexing when controlling for funds that have an active share less than 60%. Only being topped by Poland where the mutual fund market has approximately 58% closet indexing according to this measure. Truly active funds are those that have an active share over 60%, closet indexers have an active share of less than 60%. Explicit indexing in Sweden had an average shareholder cost of 0.56%, closet indexing had a average cost of 1.47% and truly active funds had an average shareholder cost of 1.42%. The average shareholder cost was calculated with the total expense ratio (TER) together with one fifth of the front-end load of the fund.

When we discuss economic costs to investors in our study, we will only concern ourselves with TER, which we will call management fees for the sake of the reader.

In Sweden there are also legal limitations to how few securities a fund manager can have, this is to ensure diversification in the fund. In the Swedish Investment Funds Act (*Lag om värdepappersfonder*) it is stated in chapter 5, 6§, that an investment fund in Sweden is not allowed to invest more than 5% in a single securities constituent, however if there is no investment in state or government, as well as no investments in bonds or similar financial instrument, the fund may invest up to, but no more than 10% of its holdings in a single securities constituent, however these holdings are not allowed to exceed 40% of the fund's total holdings. Therefore, the minimal required holdings a fund manager can have is 16 different securities constituents, four 10% securities and twelve 5% securities.

2.3 Previous research on economic consequences of closet indexing

One must ask themselves why a fund manager would chose to invest close to an index, is it simply because they are not skilled enough to find stocks that are different from the benchmark (or different weights) or is there a market mechanism that is overlooked when evaluating performance of active fund managers? Jeffrey Wurgler (2010) discusses performance evaluation and how index-linked investing has increased the difficulty for active fund managers to beat the market. For example, there is a certain momentum effect when a stock is included in a major index like the S&P 500, where index fund managers must buy around 8,7% of the stock to rebalance their index fund to include the new stock regardless of the fundamental

value of the stock[2]. Wurgler (2010), refers to Morck and Yang (2001) who found that the in the inclusion of the S&P 500, a newly added stock enjoys a newfound price premium, further implicating that joining a popular index have positive cash inflow effects for no other reason than joining a new family of stocks that are subject to passive index investing. Even more so, a stock included in a major index like the S&P 500 starts to co-move with its index peers more than with the rest of the market and that is the critical economic impact of index-linked investing. What this means for active fund managers is that stocks that are included in major indices might be worth picking, and overweighting, rather than stocks that are not included in major indices. This is because the latter mentioned does not enjoy the same amount of passive fund investing inflows, therefore there is a separation in the companies' fundamental value and the stock price. Thus, the growth of index investing[3] might not only be an effect of poor performance from active fund managers, but also part of the cause.

When there is a seller there is also a buyer for a product to exist, but who would buy a product that is not only more expensive but also performs worse than the cheaper option? The previous literature shows that closet indexing is an inferior product that should, and hopefully will, diminish as the amount of explicit indexing increases. Yet, there is still evidence that closet indexing is still being practiced around the world (Cremers et al. 2016), so it begs the question as to why investors are still investing their money into active funds that show a low active share? It might imply that there is a case of bounded rationality, a term coined by Herbert. A. Simon (1982), which describes a person's inability to acquire and digest all available information needed to make the most optimal decision at a given time. Thus, one might deduce that the buyers of said active funds that are closet indexers are investors who do not possess the information needed to make the most optimal decision and choose a fund with a higher active share. More research as to why fund managers practice closet indexing has been done by Gottesman, Morey and Rosenberg (2013), their study done on performance and subsequent annual fund flows shows that investors do not reward fund managers for outperformance in a downward market, however in a upward market fund managers are rewarded for outperforming their benchmark and enjoy increased fund flows. Therefore, Gottesman, Morey and Rosenberg (2013) concluded that fund managers are incentivised to closet index in a downward market,

[2] Fundamental value meaning the value of a stock with regards to its economic and financial performance, either determined through a absolute valuation of discounted cash flows from future forecasted earnings or relative evaluation through peer evaluation.

[3] Bloomberg reports that as of september 2019, US index fund market has surpassed US active fund market with index funds managing 4.217 trillion USD and active funds managing 4.246 trillion USD

so that their fund and the active manager in charge does not sustain substantial losses, as it could harm the fund managers' compensation or risking getting fired.

3. Data and Method

This section focuses begins with describing the model that will be used in the research and it's variables, It continues with explaining how the data was collected and which databases were used.

3.1 The model

The model that we have chosen to use and mimic for our research was introduced by ESMA (2016). The model has its foundation in the research paper made by Cremers & Petajisto (2009), where the writers made a clear cut off point for closet indexing at less than 60% active share. In addition to what was said in Cremers & Petajisto (2009), ESMA (2016) opted to use three different sets of metrics to provide a range for the extent of which potential closet indexing occurs. These three sets of metrics are provided below.

1. The fund has an active share of less than 60% and a tracking error of less than 4%.

2. The fund has an active share of less than 50% and a tracking error of less than 3%.

3. The fund has an active share of less than 50%, a tracking error of less than 3% and a r-squared of more than 0.95.

The first criteria are based on the research made by Cremers & Petajisto (2009) and uses the 60% cut off point for active share, which was introduced in in their research. Together with a tracking error of under 4% this this is the most commonly used criterion for detecting closet indexing in markets. Since the objective of the ESMA (2016) statement was not only to detect if closet indexing is occurring in Europe, but also to show to which extent this takes place, their approach was to stricten the criteria for the second and third sets to more imitate an index. This was done by lowering the cut off points for active share and tracking error in the second set and introducing r-squared as a third metric for the third and most strict set of criteria.

3.2 Definition of activity measures

3.2.1 Tracking Error

Portfolio risk is often measured against a benchmark like an index and a common metric to calculate this risk is through tracking error. Tracking error measures the volatility of the difference between the return of a portfolio and the return of a benchmark.

Tracking Error = The Standard Deviation of (Portfolio Return - Benchmark Return)

The lower tracking error, the more does the return of the portfolio correlate with the underlying benchmark. Typically, an active fund manager aims to have a higher expected return than the benchmark, while at the same time aiming for a low volatility (tracking error) to avoid the risk of significantly underperforming against the index (Cremers & Petajisto 2009).

In this report the tracking error of each fund is computed against either the OMX30 Cap GI Index, if the fund focused on Swedish large cap companies, or against the OMX Small Cap Total Return Index, if the fund had a small cap focus. The tracking error was calculated as the average of 12 quarterly observations for each fund against their benchmark.

3.2.2 Active share

Since active share was introduced by Cremers & Petajisto (2009), the measurement has been commonly used in reports about fund activity. Active share was specifically introduced to detect closet indexing by comparing the holdings of a fund and its benchmark. It is defined as following:

$$Active\ Share = \frac{1}{2} \cdot \sum_{i=1}^{N} \left| W_{Fund,i} - W_{Index,i} \right|$$

where $W_{Fund,i}$ and $W_{Index,i}$ are the portfolio weights of asset *i* in the fund and in the benchmark.

Active share can only take on values between 0-100% for a mutual fund that is exclusively investing in long positions. Funds that take short positions can reach an active share of over 100% but these funds are not included in this paper in accordance with Cremers & Petajisto (2009). The higher the active share, the more a fund's holdings differs from the holdings of their benchmark. An active share of 0% indicates that the fund's holdings is a complete copy

of the benchmark index whereas an active share of 100% means that the fund is not investing in any securities that are included in the benchmark index.

Cremers and Petajisto (2009) states that funds with an active share under 20% should be considered pure index funds while funds with an active share over 60% should be considered to be active. The funds that does not fit into any of these groups, i.e. funds with an active share between 20%-60%, are to be considered as closet indexers. The cut off point for closet indexing being set at 60% active share is somewhat arbitrary. The reasoning behind the cut off point, provided by Cremers & Petajisto (2009), is that it would be very hard for an active fund manager to justify investing more than half of their assets into an index. Petajisto (2013) provides a more detailed explanation to the cut off point. The paper states that since about 50% of an index will always experience above average returns and about 50% of the index will experience below average returns, there is no return-based reason for a fund manager to hold more than 50% of an index, i.e. having an active share of less than 50%. Instead the only reason for holding more than 50% of an index must be to reduce the funds risk relative to the index even if that means including negative alpha stocks in the portfolio, which is basically what investors pay fund managers not to do. In this paper we are using the 60% cut off point as in Cremers & Petajisto (2009) and ESMA (2016).

The active share can increase in the three following ways (Table 1, Appendix):

1. The difference in the weight of a specific holding that is included in both the benchmark and the fund increases which makes the index and the fund less alike.

2. The fund has a holding that is not included in the index at all. In this case the full weight of the holding is added to the calculation of active share.

3. The fund has not invested in a holding that is included in the index. Like in 2, the full weight of the holding is added to the calculation of active share.

When calculating the active share of the funds we used the weighted holdings data that we received from the Swedish FSA and the weighted holdings data of the appropriate index that we extracted from the Bloomberg terminal. OMX30 Cap GI Index was used in the case of Swedish large cap funds and OMX Small Cap Total Return Index was used for the Swedish small cap funds.

3.2.3 Active share and tracking error in tandem

Both tracking error and active share are individual measurements to determine the activity of a fund, so why do we need both? According to Cremers & Petajisto (2009), the reason to use both tracking error and active share is that they have big shortcomings when used separately. For example, a fund manager that actively invests in large stock-specific positions will produce a high active share. If they at the same time invests its active positions across many industries and does not bear any systematic risk in relation to the benchmark, this will result in a low tracking error. If only tracking error was used for measuring activity in this case, the fund would be seen as less active because of the low tracking error while in fact the managers are actively picking a lot of the positions. On the contrary a fund that is investing in factor portfolios but not trying to pick exclusive stocks in such a portfolio could experience a higher tracking error with a relatively low active share. Thus, using both measurements instead of only one leads to a more precise prediction of which funds are truly active (Appendix B1).

3.2.4 R-Squared

The term r-squared or R^2 is most commonly used for measuring the portion of the variance of a dependent variable that is explainable by an independent variable in a regression. Contrary to the correlation between two variables, the r-squared term will tell us how much the variance of a variable explains the variance of a second variable. R-squared can take a value between 0 and 1 and is defined as below.

$$R^2 = 1 - \frac{Explained\ Variation}{Total\ Variation}$$

In this report, as also in ESMA (2016), we do not perform a regression and that fact can make it hard to understand why the r-squared measure would be needed for our research. In this case the r-squared ratio represents the percentage of which the changes in a fund's performance can be explained by the changes in the performance of their benchmark. The closer the r-squared is to 1, the more a fund's performance is correlated to that of an underlying benchmark index.

3.3 Sample Selection

Our sample consists of 32 funds from 13 different financial institutions, being screened from the screening tool, Lipper by Thomson Reuters. First and foremost, we screened for long-only

equity mutual funds in Sweden. Then we made sure that they had a launch date before 01-01-2017 and that they were still active today so that no complications would arise when extracting our data for the period of research. The last two screening criteria that were used was a Total Net Assets (TNA) of more than 50M Euros and management fees of over 0.65% in accordance with ESMA (2016) screening criteria.

The benchmarks being used in this study to calculate the funds activity measurements are the OMX30 Cap GI Index and the OMX Small Cap Total Return Index, two indices which holdings we had access to through Bloomberg. We chose to focus on these funds because we only had access to their comparable indices, and we did not want to use index replicas like Exchange Tradable Funds (ETF) as benchmark indices for our funds since we feared that using replicas might compromise the comparability and integrity of our research. The list of funds we were able to observe are funds that were either specified in the Swedish small cap market or the Swedish large cap market (Appendix A1). Our sample size might seem small in comparison to previous research on fund activity, however we feel that the sample size is of good quality since the only criterion used to filter out other active funds were funds that were either too small (TNA under 50M euros) or had management fees under 0.65%, making them irrelevant for our research.

We decided for our sample period to be three years from 2017 Q1 to 2019 Q4, resulting in 12 quarterly observations of data. Traditionally, in comparable research, the sampling periods have been five or more years to rid any statistical biases, however, we feel confident that three years of sampling is adequate since three years (2012-2014) was also used in ESMA (2016) and only one year was used for the calculation of active share in Cremers et al. (2016), the reason being that active share has a serial correlation of 95%, meaning that a funds activity characteristics are extremely unlikely to change over time. We argue that three years of management of a fund would give enough time for the fund company to evaluate the activity of the fund internally, or one would hope so at least. Furthermore, a three-year time period should give a fund manager enough time to deliver a strategy that deviates from a general benchmark index.

To interpret the economic impact for investors we screened for explicit index funds that were benchmarked to general market indices like OMX 30. Through Thomson Reuters we obtained 12 Swedish equity index funds. Again, screening for funds that has a TNA over 50M Euros,

and opposite to when screening for the actively managed funds, we now screened for management fees of under 0.65%. A last criterion was that the fund should be considered as equity index tracking.

3.4 Databases

To obtain the active share of the funds, we had to calculate it manually from holdings data that we received from the Swedish FSA (*Finansinspektionen*). The calculation itself was done in excel in accordance with the calculations illustrated in appendix A1. Since Swedish mutual funds companies are required to report their holdings on a quarterly basis to the FSA, we could acquire all the fund holdings that we required. When we received the holdings data, it was complete with the different funds ISIN-codes and the fund names which made it much easier to pair them with the funds that were screened through Lipper by Thomson Reuters.

The sample funds were found with the help of Thomson Reuters screening function, Lipper. With this database we could screen for a list of funds by sorting on country of domicile, countries noted for sale, size, asset universe, asset type, asset status, inception date and specification. We also added the funds ISIN-codes to the final screen to be able to pair them with the data from FSA.

Bloomberg was the database of choice when obtaining the tracking errors, index holdings and r-squared. Both tracking error and r-squared was produced by comparing the funds with the chosen index in the Bloomberg database, which provided a value directly. The OMX30 Cap GI and the OMX Small Cap Total Return Index was chosen to be the benchmarks used for this research because their holdings availability and the good fit for both the Swedish large cap specific funds and for the Swedish small cap specific funds.

4. Results of the study

This section will present the results of the study, which will then be further explored in the discussion.

4.1 Closet indexing in Swedish equity mutual funds

In Table 2 below, the results of our main study are presented. Applying the different criteria provided by ESMA, we can observe that over a quarter of the funds investigated were found to be potential closet indexing funds based on the metrics used in Cremers & Petajisto (2009) and as the first level in the spectra of potential closet indexing in ESMA (2016). When lowering the active share and tracking error threshold to mimic ESMA (2016) we found that only 3%, or 1 out of the 31 funds that were part of the study, could be labelled as a potential closet indexer. This result goes for both the second and third set of metrics used in the study.

Table 2: *Results of the potential closet indexing study*

Criteria	Potential Equity Closet Indexing Funds	Potential Actively Managed Equity Funds
Active share <60% + Tracking error <4%	8/32 | 25%	24/32 | 75%
Active share <50% + Tracking error <3%	1/32 | 3.125%	31/32 | 96.875%
Active share <50% + Tracking error <3% + R-Squared >0.95	1/32 | 3.125%	31/32 | 96.875%

The table is showing both the percentage amount and the numerical amount of potential equity closet indexing funds on the Swedish mutual fund market, focused on the Swedish equity market. The table is also showing the portion of potentially actively managed equity funds.

In this report it was found that the amount of potential closet indexing in Swedish mutual funds with focus in the Swedish equity market, ranges from 3.125-25%. This is a wider range than the 5-15% range that was presented by ESMA (2016) in their EU wide study. In Table 3 a comparison of the three different sets of metrics is illustrated. At first glance the study made on the Swedish market has a bigger portion of closet indexing according to the commonly used <60% active share and <4% tracking error threshold. At the same time, it can be noted that when applying the stricter criteria used by ESMA (2016), the Swedish study presents a lower portion of the more severe potential closet indexing.

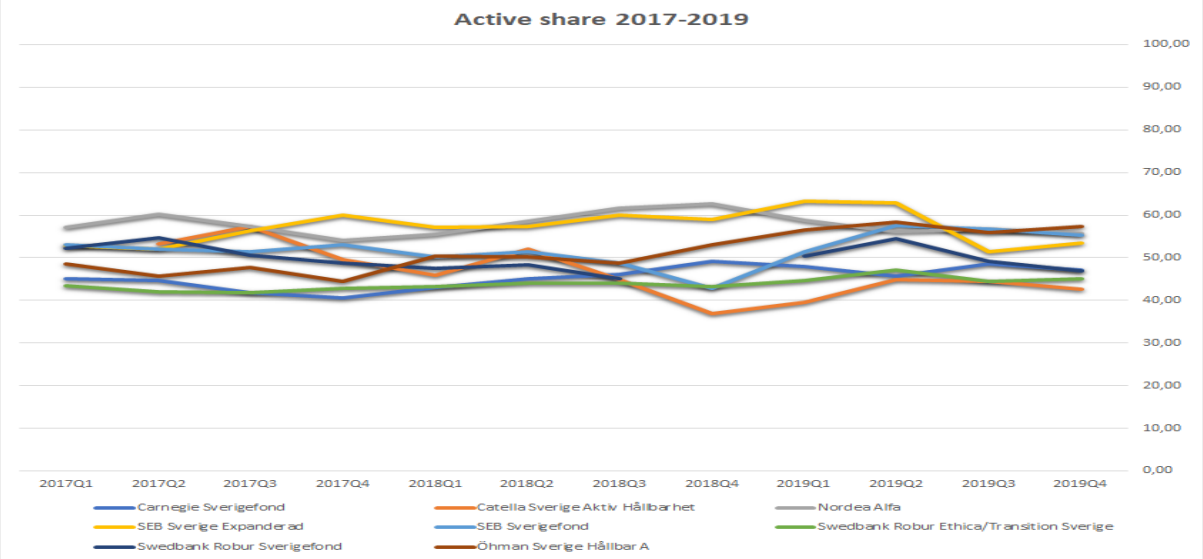
Table 3: *A comparison of the results in ESMA (2016) and the results in this report*

Criteria	Potential Equity Closet Indexing Funds (Sweden)	Potential Equity Closet Indexing Funds (ESMA)
Active share <60% + Tracking error <4%	25%	15%
Active share <50% + Tracking error <3%	3.125%	7%
Active share <50% + Tracking error <3% + R-Squared >0.95	3.125%	5%

This table illustrates the percentual results of the study made in this report compared with the percentual results of the study performed by ESMA (2016).

To strengthen the results of our study we want to show, in figure 1 below, that the funds that have been observed as potentially closet indexing are showing no signs of trying to increase their active share to over the 60% cut off point for active share. They are instead demonstrating a steadily lower percentage of active share. This is in accordance to high serial correlation as discussed by Cremers et al. (2016).

Figure 1: *The active share of the observed potentially closet indexing funds*



This figure illustrates the change in active share for the funds that were observed as potentially closet indexing during our chosen sample period of 2017-2019.

4.2 Economic impact of closet indexing for investors

After concluding that eight funds are potentially closet indexing, we want to know what the economic interpretation of this is, and why it matters for investors. This was done by comparing these funds to 12 explicit Swedish equity index funds, with varying costs depending on their

strategy. For example, *Öhman Etisk Index Sverige A* has an ethical focus and therefore charges a fee of 0.49%, which relatively high for a passive index fund. *Swedbank Robur Access Sweden*, which is replicating the OMX30 Index, charges less than half of the fee of the ethical index fund, demanding only a fee of 0,20%. These index funds are tracking major Swedish stock indices like OMX 30 Stockholm Index, giving us the opportunity to make a fair comparison between the closet indexers and explicit Swedish equity index funds. We take the average fee for the index funds, which in this case for the 12 index funds were 0.26% and comparing it to the average management fee for the closet indexers which amounts to 1.35%. There is a considerable difference of 1.09% in fees that the supposed active funds are overcharging, if they are in fact classified as closet indexers. To calculate the difference in direct costs to investors, we compare what the cost would be if the potentially closet indexing funds were charging the average index fund fee of 0.26%, with what the cost of these funds is right now at an average fee of 1.35%. Taking the aggregate total net assets (TNA) of the potential closet indexing funds in our sample which is MSEK 71640 and multiplying it by the average management fee of the potentially closet indexing funds which is 1.35%, we see that investors is paying MSEK 964 in combined fees to these funds. When instead multiplying the aggregate TNA of the potentially closet indexing funds (MSEK 71640) with the average index fund management fee (0.26%), the cost for investors would only amount to a mear MSEK 188, thus making the practice of closet indexing cost investors MSEK 776 in aggregate (Appendix A2). Worth to notice is that the aggregate TNA is calculated as the total TNA of all the funds as reported by the individual funds as of 03/31/2020, same goes for the fees, they are the most recent reported fees being charged by the funds, therefore this can be interpreted as the current economic cost of closet indexing to investors.

Figure 2: *Difference in cumulative return on the OMX 30 Stockholm Index (Nasdaq, 2020).*

This figure shows the difference in cumulative returns, with an initial investment of 10 000 SEK over a ten year period with respect to the difference in fees. The green line represents the return with 0.26% annual fees, and the blue line represent the return with 1.35% fees

To exemplify the cost to investors with regards to fees and how it affects their savings, we compare them using the returns of the OMX 30 Stockholm Index and an initial investment of 10 000 SEK (Nasdaq, 2020).

As the graph shows there is a considerable difference in return due to the cumulative effect of long-term investing. If the fees for investing in this OMX 30 Stockholm index were 0.26% then the investor would, after a ten year period, have accumulated 14 156 SEK as opposed to 12 725 SEK if the fees were 1.35%, an effective cost of 1 431 SEK to investors over a ten year investment horizon or in other words, a -14.31% negative return only attributed to fees.

5. Discussion

This section will discuss the results found in the study. Both reflecting on our own thoughts as well as comparing our results with the results of earlier research on the subject.

5.1 Discussing the results of the study on closet indexing

A question that arises when reading the results of this study is why so many of the Swedish equity funds fall under the first criteria, but steers clear of the other two criteria (see table 2). Perhaps it could be because Swedish equity fund managers are treading carefully on the edge of closet indexing or benchmark hugging to get the best of two worlds. On the one hand, there are secure returns when following the index and minimal risk of severely underperforming in comparison with their benchmark. On the other hand, there is the ability for the fund to still label itself as being "active" and therefore enabling the reaping of a higher management fee from the investors. This way the managers can keep the risk much lower compared to the risk of being an active stock picker while at the same time letting the returns of their fund track the return of their benchmark.

If we look at Table 3, we find that there is a rather large difference between Sweden and EU looking at the first criterion while there is a smaller difference when looking at the second and third. The difference at the third set of metrics is not very big, in comparison to the results of ESMA (2016), and seeing as just one more fund breaking into level three in our research would turn the tables and make the Swedish portion bigger, the difference could really just be a result of the smaller sample size that was used for Swedish equity funds with Sweden as geographical investment universe in this report. Another possibility might be that Sweden has a bigger portion of the fund industry potentially practicing closet indexing, especially when looking at active share. As stated before in this paper, Cremers et al. (2016) reported that 56% of Swedish funds had an active share of below 60%, indicating that Swedish active fund managers replicate the benchmark to a big extent.

In our study we find ourselves asking a couple of questions; What added value does active managers provide to the investors, and how come people are still investing in these actively managed funds when they are underperforming index funds net fees? We believe that this has to do with bounded rationality (Simon 1982). Investors may not possess enough knowledge of index funds and what closet indexing is and that they are usually underperforming the market (Cremers & Petajisto 2009, Cremers et al. 2016). Perhaps the phenomena of closet indexing are not widespread knowledge among these investors and they therefore cannot make the most optimal investment decision. Perhaps there is too little indexing in Sweden to enhance and

reduce the number of closet indexers, as Cremers et al. (2016) found, the increased presence of index fund investing in a country correlate to fewer closet indexers.

However, the active fund managers could also feel obligated to invest in index-linked stocks, thus displaying a low active share. This because of the price premium of stocks that is caused by being included in a major index because of explicit index fund investment flows and that the stock starts to correlate more with the index itself than the market, becoming more divorced from its fundamental values (Wurgler, 2010). Therefore, managers could face a situation where they are between a rock and a hard place. Either they invest in stocks that are perhaps undervalued but non-index linked, in order to achieve a high level of activity. Or, they could invest in stocks that are index-linked but perhaps overvalued, making them seem less active in management, but because of the explicit index linked investment flows, the latter stock could still enjoy greater returns than the first. It could also be that with larger sized funds, such as *SEB Sverigefond* which has 12 billion SEK AUM, the sheer size of the fund is making it hard to engage in active market plays. As the funds must be able to liquidate their positions and trade, the fund becomes unable to be flexible in the market, it must naturally stay close to index and invest in the largest companies. This theory would match the findings of Petajisto (2013) where fund size and activity were found to be negatively correlated. There is also the issue of legal requirements in the Swedish mutual fund industry, because of the Investment Fund Act, mutual funds in Sweden cannot invest in less than 16 different companies. This creates problems because fund managers cannot be concentrated stock pickers and thus acquire a higher active share. Fund managers could also be practicing closet indexing because of career risk, as found by Gottesman, Morey and Rosenberg (2013), that is the risk of termination because of underperformance. However, their study (Gottesman, Morey and Rosenberg, 2013) also displayed that outperformance in an upward market was rewarded and thus during such a market, managers should be incentivised to not practice closet index. However, our findings show that even through an upward market as 2017-2019, the active share of the eight observed funds did not change significantly. It could be as argued by Gottesman, Morey and Rosenberg (2013) that managers avoid severe underperformance in an upward market by closet indexing because it hinders underperformance and thus large outflows from the fund. However, it also limits the inflow the active manager will receive in said fund, thereby the active managers might risk their careers. We are sceptical to the argument that fund managers might be fired because of closet indexing in a upward market (Gottesman, Morey and Rosenberg, 2013) because if so, the active share of the eight funds we have observed should have changed

significantly during the three year period we observed. One could argue that our sample's time period is too short for the funds to correct themselves and acquire a higher active share, but Cremers et al. (2016) also reported that active share has a serial correlation of 0.95, thus the level of activity in a fund seem to be inherently characteristic to the fund itself.

Table 4: Results of the closet indexing study with a fourth level

Criteria	Potential Equity Closet Indexing Funds	Potential Actively Managed Equity Funds
Active share <60% + Tracking error <4%	8/32 | 25%	24/32 | 75%
Active share <50% + Tracking error <4%	4/32 | 12.5%	28/32 | 87.5%
Active share <50% + Tracking error <3%	1/32 | 3.125%	31/32 | 96.875%
Active share <50% + Tracking error <3% + R-Squared >0.95	1/32 | 3.125%	31/32 | 96.875%

The table is showing both the percentage amount and the numerical amount of potential equity closet indexing funds as well as potential actively managed equity funds. A fourth row has been added to further show where funds are falling of the spectrum of closet indexing.

The lighter grey row in the table is our own addition to the three original levels to illustrate that even though most of the funds are falling out between the first and the second original level, with seven of the eight funds falling outside the original model by ESMA (2016), at least some of them does not fall out because of the active share but rather from having a higher tracking error. We feel that an addition of a level is important because it highlights the fact that the model provided by ESMA (2016) is not fully reliable on its own, but perhaps should be developed further. Petajisto (2013) provides a good argument that funds that have more than half of their portfolio invested as the benchmark, cannot possible be considered as active, since a majority is in fact mimicking the benchmark. Furthermore, a fund with less than 50% active share cannot provide satisfying performance since half the portfolio is going underperform the benchmark by the amount of the management fee, and the other half might provide above average results net fees. Thus, as Petajisto (2013) argues, the only reason the active manager introduces such index hugging is because the fund manager is trying to mitigate his risk, even though it means introducing negative-alpha stocks.

The Swedish equity funds we observed, with Sweden as its geographical investment universe, seem to be able to operate with a lower active share when at the same time not tracking the

index too closely. This might indicate that the holdings that are not included in the funds benchmark index does not correlate with this benchmark as much and are therefore swaying the tracking error to be larger, hence putting the funds outside the scope for these significance levels. This is alarming since a fund with over half of its holdings overlapping with the index cannot be argued as being actively managed. Another argument by Petajisto (2013) that we want to highlight, is that the fee that is paid by investors to active managers is considerably higher if investors in active funds only care about the active holdings. Therefore, the displaying of a fourth level of activity, one that is not considered by ESMA (2016), is of interest as the fees from these funds could be considered twice as high.

5.2 Discussing the economic consequences of closet indexing

We observe that in our sample the management fees are lower than what was observed in Cremers et al. (2016), however, there could be several reasons to this. One is that our sample is smaller than that of Cremers et al. (2016), but also that our study was done on mutual funds that invest in the Swedish equity market with Sweden as its geographical investment universe and only on those which had a TNA of over M50 euro, whereas Cremers et al. (2016) observed the whole Swedish mutual fund market. Another factor is that Cremers et al. (2016) ads on one fifth of front-end load costs to their average shareholder costs, however, we do not make this addition to the fees because depending on which financial intermediary you choose the cost will vary. Also, banks will not charge their own clients with this extra fee. From the observed sample we have, the average fees of the closet indexers are overcharging by 412% with investor cost of MSEK 964 as opposed to MSEK 188. These additional fees of MSEK 776, as of 2020/03/31, could be forced to be reimbursed to the investors by the financial institutes themselves, much like how DNB (2019) was forced to reimburse MNOK 350 to approximately 180 000 shareholders. However, in DNB's case, they also had to reimburse the return to investors affected by these fees, as we showed in figure 2, these fees can have serious impact on the long-term return.

We illustrated that an investor investing 10 000 SEK in the OMX 30 Stockholm Index would acquire a -14.31% difference in return, that is only attributed to the difference in fees. This is of concern as Sweden has a large portion of the household savings, 9.2% (OECD, 2018) in mutual funds, only 6 other countries have a higher share of their household financial assets in mutual funds in the European Union. Furthermore, if we only regard the active positions as the

ones responsible for the active management fees as Petajisto (2013) argues, the active fees are much larger and the overcharging skyrockets. For example, the four funds observed with an active share of less than 50%, the investor is being charged more than double the management fee, since the investor is paying a management fee only for the active positions the fund manager is taking.

6. Conclusion

From our findings there could be 3-25% of Swedish domiciled equity mutual funds with Sweden as geographical investment universe that could be potentially classified as closet indexers, depending on the strictness of the criteria used to make such a classification. This is a noteworthy proportion that is higher than the comparable EU wide report from ESMA that has a range of 5-15% equity funds being potential closet indexers. Furthermore, the study Cremers et al. (2016) showed that when only checking for an active share of <60% as a measurement, the Swedish mutual fund industry, showed that there was 56% of funds practising closet indexing. Even though our report is only studying a specific sector within the Swedish mutual fund industry and more research needs to be done at a nation- and sector wide level in the future, our suspicion is that the Swedish mutual fund industry as a whole will show results of having a larger share of closet indexing than the average EU mutual fund industry. This suspicion is born from our findings in the literature review that there are deeper problems within the active mutual fund industry. Such as investors bounded rationality and their inability to digest all the information needed to make a sound investment when it comes to mutual funds. As well the stocks correlation with the index and them becoming more separate from the company's fundamental values, making them obligated to buy stocks that coincides with the index. Or fund managers inability to take active market positions because of the huge size of the fund's assets. As well as the career risk fund managers face when deviating from the benchmark. Another reason could be that explicit indexing in Sweden does not have enough market shares to compete to active funds and thus rid the closet indexers as they are inferior products.

One must ask themselves what intrinsic value an active manager gives the investor. If it is simply having a man on deck to stir the ship, whatever the risk/return or actual cost, then perhaps closet indexing is fine. But, we do believe that investors, like consumers buying any product, have a presumption that when they are investing in a fund that labels itself as active

and thus are able to demand active fees, the fund will be engaging in active market positions and that their portfolio will differentiate from that of the benchmark to meet the investors' expectations when it comes to their risk/return scheme. .

We can conclude from our study that there is a direct negative cost to investors of the potentially closet indexing funds in the Swedish equity mutual fund industry in Sweden. We found a direct cost of MSEK 776 to investors when calculating the differences in fees for closet indexers and comparable explicit index funds, the overcharging thus was an average of 412% (MSEK 188 cost as opposed to MSEK 964). We demonstrated the critical difference that fees will have on long term investing, showing that a initial investment of 10 000 SEK in the OMX 30 Stockholm Index over a ten year period will sustain a -14.31% return simply because of a 1.09% difference in fees. .

We invite for there to be more research done on the Swedish mutual fund industry and its level of activity, on both a nation- and sector wide level. Also, there needs to be research and discussion as to what we, in the Swedish mutual fund industry context, will conclude closet indexing to be. Because as our discussion of the results showed, although ESMA (2016) has a rigorous model from which we can compare our results from, it does not capture potential closet indexing to its fullest extent. There needs to be more research and discussion as to what intrinsic value active fund managers give their investors. We have for example not in this study been able to evaluate other aspects of active fund managers, such as corporate governance or the human aspect of fund management, i.e. having a human or fund manager, handling your money. We would also encourage further research on how the Swedish Investment Fund Act affects the possibility of acquiring a higher active share in the Swedish mutual fund market.

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Appendix A: Tables

A1: Active share calculation example

Security	Portfolio weight%	Index weight%	Difference%	Absolute value%
1	70	30	40	40
2	0	70	-70	70
3	30	0	30	30
			Sum	140
			Active Share	**70**

This table illustrates the three ways in which a portfolio's active share can be affected. This table was made with help from Lazard Asset Management (2017).

A2: Funds used for the research

Mutual equity funds used	Index funds used

Aktie-Ansvar Sverige A	**Aktiespararna** Topp Sverige
Carnegie Sverigefond A **Carnegie** Smabolagsfond A	**Avanza** Zero
Catella Sverige Aktiv Hallbarhet **Catella** Smabolagsfond	**Catella** Sverige Hallbarhet Beta A
Didner & Gerge Smabolag **Didner & Gerge** Aktiefond	**Länsförsäkringar** Sverige Indexnära
Handelsbanken Sverige **Handelsbanken** Svenska Smabolag	**Handelsbanken** Sverige 100
Lannebo Sverige Plus **Lannebo** Sverige **Lannebo** Smabolag	**Nordnet** Indexfond Sverige
Nordea Smaboladsfond Sverige **Nordea** Alfa **Nordea** Aktieallokering	**Nordea** Sverige Passiv Icke-Utdelning
Ohman Sweden Micro Cap A **Ohman** Sverige Hallbar A **Ohman** Smabolagsfond A	**Ohman** Etisk Index Sverige A
PriorNilsson Sverige Aktiv A **PriorNilsson** Realinvest A-Klass	**SPP** Aktiefond Sverige A
SEB Sverigefond Smabolag Chans/Risk **SEB** Sverigefond Smabolag **SEB** Sverigefond **SEB** Sverige Expanderad	**SEB** Sverige Indexfond
Skandia Smabolag Sverige	**Skandia** Sverige Exponering
Spiltan Aktiefond Sverige **Spiltan** Aktiefond Stabil **Spiltan** Aktiefond Smaland	
Swedbank Robur Sverigefond **Swedbank Robur** Smabolagsfond Sverige **Swedbank Robur** Exportfond **Swedbank Robur** Ethica Sverige	**Swedbank Robur** Access Sverige

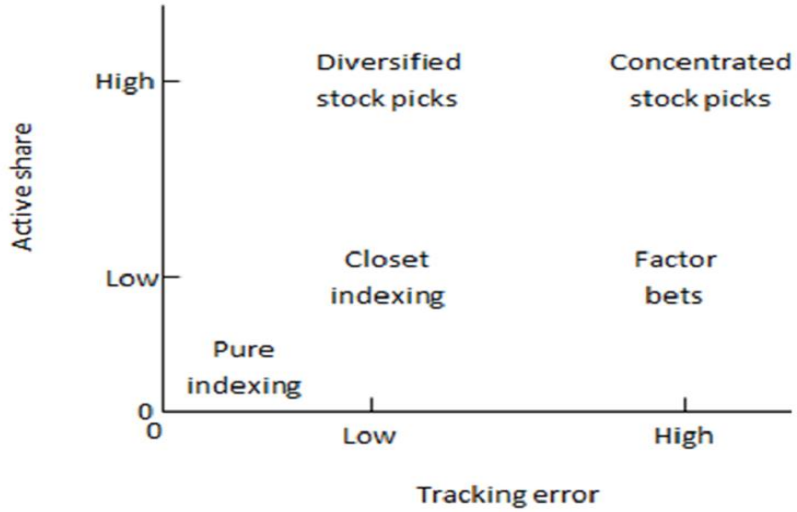
A3: Calculation of the Potential economic loss for investors due to closet indexing

Index funds	Passive fees	Closet indexers	Active fees	TNA (MSEK)
Swedbank robur access Sverige	0,20%	Carnegie Sverigefond	1,42%	14794,27
Skandia Sverige Exponering	0,25%	Catella Sverige Aktiv H	1,60%	3181,47
SPP Aktiefond Sverige A	0,21%	Nordea Alfa	1,40%	13580,34
SEB Sverige Indexfond	0,25%	Öhman Sverige Hållb	1,30%	2047,95
Öhman Etisk Index Sverige A	0,49%	SEB Sverige exp	1,25%	8274,56
Nornet Indexfond Sverige	0,00%	SEB Sverigefond	1,30%	12241,81
Nordea Sverige Passiv Icke-utdelning	0,41%	Swedbank Robur Ethica	1,25%	6786,95
Länsförsäkringar Sverige indexnära	0,21%	Swedbank robur sverigefond	1,25%	10732,7
Handelsbanken Sverige 100	0,20%	Aggregate TNA		71640,05
Catella Sverige hållbarhet Beta A	0,62%	Average fee for closet indexers	1,35%	
Avanza Zero	0,00%			
Aktiespararna topp Sverige	0,31%	Total expense for closet index funds	964,45	
Average fee for index funds	0,26%			
Total expense if index fund fees	188,06			

Total cost for investors (MSEK)	776,40			

Appendix B: Figures

B1: An explanatory figure for closet indexing



Active share represents the portion of a portfolio's holdings that differ from the holdings of a benchmark index. Tracking error shows the volatility of a fund's return in excess of the benchmark. Together the measurements can help with discovering closet indexing but when used alone the result can be very wrong at times.