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Seasonal Commodities in Mutual Funds

A Feasibility Study of using seasonal commodities as basis for a commodity fund

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At the time of writing this thesis, commodities are regarded as a minor alternative investment strategy. While mutual funds are the easiest way for an individual to invest, very few funds utilize the potential of commodities. The purpose of this thesis was to examine and study the current practices relating to seasonal commodities and the use of seasonal commodities in commodity funds. The research aimed to answer the question: "Is it possible to create a mutual fund around the seasonality of commodities and make it beneficial for all parties involved?"

First part of the research was designed to collect data through interviews to establish the current state. Secondly a literature review was conducted to provide a baseline for a conceptual framework and lastly this thesis' research ends in building the proposal.

The result of the current state analysis was a comprehensive study into both domestic and foreign commodities funds and their use of seasonal commodities in their investment strategies. That along with the current state interviews provided a good foundation to build the literature review on. Most of the topics, such as Margin-To-Equity, were uncovered in the current state analysis and were researched further to build the conceptual framework. Proposal was built based on the conceptual framework and its viability checked through quantitative studies conducted with data gathered from Seasonalgo and Bloomberg.

The research shows that it is in fact possible to create a mutual fund around the seasonality of commodities. The strategy formulated through the process certainly has room for improvement, but the scope of this thesis is to assess the viability of such an idea and certainly not to optimize it.

This thesis contributes well into the academic dilemma where commodities are regarded with high potential for diversification and profit but at the same time commodities represent a much underutilized asset class.

Keywords	Commodity, futures, trading, seasonality, asset management, portfolio management, commodity funds, Finland

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1 Introduction

1.1 Overview

A mutual fund is the easiest way for an individual to invest. Mutual funds are managed portfolios of different assets: stocks, bonds and/or other securities. Risk and return are often the mediums a mutual fund is assessed on. Generally speaking risk and return go hand-in-hand – more the risk more the return. This is called “Risk-Return Tradeoff” in the industry. Diversifying one’s portfolio reduces risk, while trying to keep the return the same. One way of diversification is investing in commodities, but commodities are often dubbed as too risky a strategy. The best investments in commodities require a large chunk of capital and at times the securities with a reasonable risk-return are out of reach for an individual investor.

1.2 Business Challenge

Asset management industry faces a challenge when investing in commodities. Commodity funds are atrociously bad in performance over the long term. Commodities are being traded like stocks, but returns are nowhere near the performance of stocks. Generally, commodities are as volatile as stocks, but on average they yield a return closer to bonds than stocks. This divergence from the normal “Risk-Return Tradeoff” drives many portfolio managers to steer clear of this asset class: Is there a way to invest in commodities while making a healthy profit and diversifying the entire portfolio?

Seasonality in commodities is a topic often discussed among commodity traders. It is the key behind the success of many commodity traders in the CBOT pits. What commodity funds use seasonalities as a basis for decisions? When a price of a security rises in 14 out of the past 15 years between October and December, why don’t we create a mutual fund around this phenomenon? Is it possible to create a mutual fund around the seasonality of commodities and make it beneficial for all parties involved? These are valid questions that need answering.

1.3 Case Company

EAB Asset Management is a Finland-based financial services company. AEB specializes in asset management and mutual fund investment services to wealthy individuals, companies and institutions. EAB Group was founded in 2000 and operates solely in Finland in 15 locations. EAB currently has around 150 employees across those locations. Elite has roughly 10000 individual clients and around 60000 clients through direct subsidiaries. In total EAB Asset Management has a total of around 3 billion euros of asset under management (AUM). This thesis is conducted in the Portfolio management unit, under the supervision of the chief investment officer and the head of research and ESG of EAB Asset Management.

1.4 Research Objectives & Scope

The main objective of the thesis is to produce a strategy for investing in commodities and how it can be done cost-efficiently while providing value for all investors in the mutual fund. Expected outcome of the thesis is a feasibility study, which points out that it is or isn't feasible to invest in seasonal commodities through a mutual fund structure.

The thesis' scope is determined by the business challenge. Simply put: The scope of this thesis is the quantitative analysis of a set of seasonal, agricultural commodities' historical price data. The scope is limited to agricultural commodities due to the exceptional seasonality of them in comparison to metals and energies

1.5 Key Terms & Acronyms

This section will cover the most used terms in this thesis. The goal of this section is to give a deeper insight into the world of finance and to help individuals who are not familiar with the vocabulary used in the financial industry. The researcher will use an established industry dictionary rather than attempt to describe the meaning of specific words. Robert Shook wrote a book in 2001 called "Online Trader's Dictionary: The Most Up-to-Date and Authoritative Compendium of Financial Terms". His book contains a vast amount of terminology regarding banking, personal finance and various other financial matters. The book is meant as a guide for aspiring finance professionals and businesspeople. However, his book is from 2001 and seems a little outdated. John Downes

wrote a similar, but smaller, book called “Dictionary of Finance and Investment Terms” in 2014 which will also be used in this section.

Asset Management / Asset Allocation Mutual Fund: A mutual fund that allocates funds on several asset classes. Allocation of funds is flexible and proportion of equity investments can change if market conditions change. (Shook 2001, p. 27)

Backwardation: Opposite of Contango. When prices of commodity futures are higher for contracts maturing sooner than those maturing later. (Shook 2001, p. 34)

Bloomberg Terminal: Computer software used for analytics and trading online in most exchanges. (Downes, J., 2014, p. 71)

Bond: Most of the time a Bond refers to an interest bearing long-term debt security issued by a corporation or government. Sometimes Bond refers to a discounted government security with similar characteristics. (Shook 2001, p. 48)

CBOT: Chicago Board of Trade

CME: Chicago Mercantile Exchange

Commodity: Agricultural products, minerals or other tangible asset that investors or portfolio managers trade on a cash or futures basis. (Shook 2001, p. 87)

Common stock: A unit of company ownership, which is represented as shares, which act as voting rights and claims to possible earnings and dividends. Also known as equity investment. (Shook 2001, p. 432)

Contango: When the price of a commodity is higher as maturities lengthen, thus creating negative spreads as contracts go further out. (Shook 2001, p. 95)

CTA: An expert in futures contracts, who advises investors on when to buy and sell futures contracts. Nowadays also called Managed Futures. (Shook 2001, p. 88)

Derivative: Derivative instruments are contracts whose value is based on the performance of another investment. (Downes, J., 2014, p. 187)

ETF: Exchange Traded Fund, or ETF, is a portfolio similar to a mutual fund that trades like common stock. ETFs typically aim to track a specific index, such as the S&P 500. (Shook 2001, p. 153)

Exchange: The physical or digital marketplace where securities are bought and sold. (Shook 2001, p. 152)

Fundamental analysis: It aims to predict future trends by looking at the fundamentals. In a company example fundamentals are company's financial statements and historical records along with news and rumors. (Shook 2001, p. 181)

Futures Contract: An agreement to sell or buy a specific amount of a commodity or security at a specific time. (Shook 2001, p. 182)

Hedge: A measure to offset risk. Gold or oil are repeatedly used to hedge inflation. (Shook 2001, p. 200)

Liquidity: There are three types of liquidity. The number of sellers and buyers that participate in the market is called Market Liquidity. Liquidity can also refer to the degree to which the asset can be converted to cash. Lastly, Product Liquidity refers to the number of transactions executed to sell a product. (Shook 2001, p. 248)

Margin: The amount of money deposited with a broker to borrow against when trading derivatives. Required margin varies between banks. (Shook 2001, p. 249)

Mutual Fund: An investment vehicle that invests the customer's money in several securities with the sole purpose of making a return on investment. (Shook 2001, p. 282)

Ongoing Charges: Yearly charge by the portfolio management firm to the customer, usually deducted in even portions from daily net asset value each day. It is also called Management Fee. (Downes, J., 2014, p. 432)

Performance Fee: A fee that incentives the mutual fund manager to outperform a set benchmark. It is paid by the customer. (Shook 2001, p. 335)

Redemption fee: A one-time fee charged at the time of an exit from a mutual fund. Used to discourage withdrawals. It is also called back-end load and typically between 0 % - 5 %. (Downes, J., 2014, p. 50-51)

Return: An investment's profits, whether through interest or dividends. (Shook 2001, p. 388)

Risk: The inherent chance that an investment will decrease in value. (Shook 2001, p. 391)

Risk-Return Tradeoff: A basic concept in investment management which states that risk equals return. In simple terms, as risk increases so do the returns. (Downes, J., 2014, p. 642)

ROI: Return on Investment, or ROI, indicates the relationship between investment and return. (Shook 2001, p. 388)

Seasonal Trend: A consistent, short-lived rise or drop in a security's price that will take place yearly. (Shook 2001, p. 402)

Securities: Usually describes stocks and bonds, but can describe any financial instrument. (Shook 2001, p. 403)

Speculators: An investor who believes investing in high-risk securities will bring higher returns. (Shook 2001, p. 425)

Subscription fee: A one-time sales charge imposed at the time of entry to a mutual fund, life insurance policy among other instruments. It is also called front-end load and typically between 0 % - 3 %. (Downes, J., 2014, p. 294)

Technical analysis: It aims to predict the future trends by looking at the technical. Generally, technical analysis is the supply and demand of the security, price movements and chart patterns. Technical analyst utilizes data over news and rumors. (Shook 2001, p. 455)

The Pit (pl. Pits): The physical trading area in futures exchange. Most commonly used for the CBOT commodity trading pits. (Shook 2001, p. 339)

Tick: A security's successive transaction price. (Shook 2001, p. 461)

USDA: United States Department of Agriculture

Volatility: It is a descriptive number that demonstrates the tendency of price fluctuation within a short period of time. (Shook 2001, p. 490)

Yield: Yield expresses the percentage amount paid in dividends or interest over a period of time at the security's par value. (Shook 2001, p. 505)

2 Research Design

2.1 Research Approach

A mixed approach consisting of qualitative and quantitative methods has been chosen as the research approach for this thesis. This thesis will use inductive reasoning as the basis for this thesis.

2.2 Research Design

This thesis begins with the business challenge stated previously. First part of data collection is done through qualitative interviews of the staff, managers and other personnel. This set of interviews will be done to formulate the current state analysis. Interviews will also be used to find the strengths and weaknesses of the current state of business. Current state analysis includes a market analysis of competitors, which will be done through literature review and research. The Current State Analysis yields key findings and the strengths and weaknesses of current practices.

Second part of data collection is done through literature review. Existing knowledge receives input from Current State Analysis in the form topics to explore. The output of the Existing knowledge is to formulate a conceptual framework. The researcher's objective is to ensure a good foundation on the conceptual framework by utilizing several research papers, articles and books surrounding the topic.

Data gathered in both the Current State Analysis and the literature review will be used to build the proposal, which is the end result of this thesis. The proposal is built by analyzing the data gathered in the interviews and through literature review. The outcome of the thesis is a feasibility study on whether a mutual fund can be created based on seasonality of commodities.

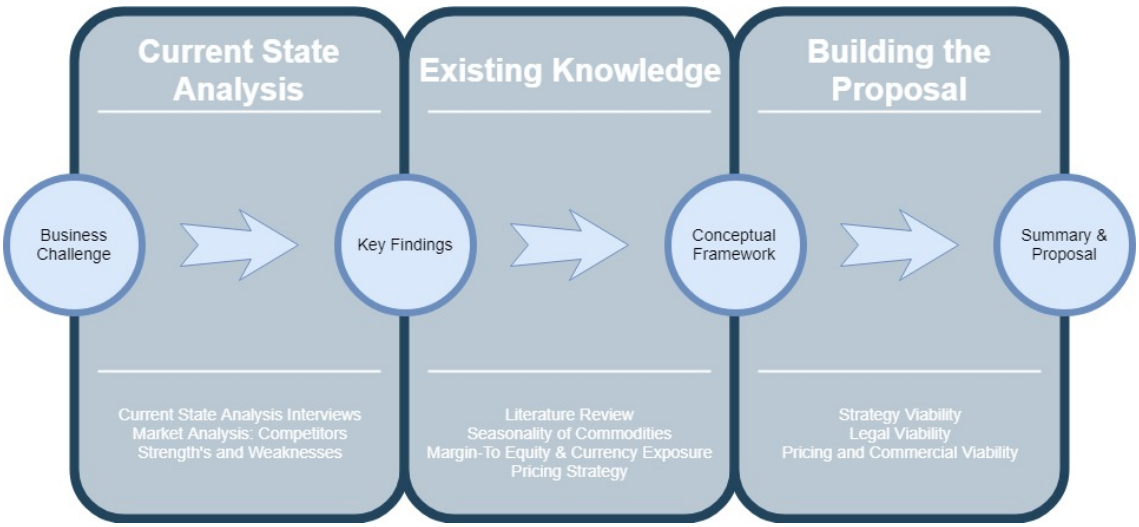

Figure 1: Research design flowchart

Figure 1 aims to visualize the entire process of this thesis in a linear and logical way. This study is conducted in the order visualized in Figure 1.

2.3 Data Collection and Analysis

Qualitative data is collected through interviews. In Current State Analysis qualitative data will be gathered from two interviewees; A portfolio manager dealing with commodities on a daily basis and a senior investment officer whose whole career has been in the financial industry. This way current state analysis will be covered on both the macro and micro level. This research is based on quantitative data collected mainly through Bloomberg Terminal, Seasonalgo and Morningstar Direct. The analysis of that data will be done in Excel.

2.4 Validity and Reliability

Validity and reliability of the research should be taken seriously. The information gathered and presented in this thesis will be presented as closely as possible to the collected data to make sure it is valid for the reader. Both qualitative and quantitative data will be gathered from multiple sources to triangulate the issue at hand and ensure validity.

Qualitative data collected in this thesis is collected from multiple sources through interviews. Interviews are used when establishing the current state analysis. Biases and

other interference must be avoided when formulating the interview questions and conducting the interview.

The quantitative data used in this thesis is acquired mainly from Bloomberg Terminal. It is the industry gold standard for data collection and analysis. It is used by over 300 000 professionals worldwide to trade, collect data and analyse. The data is valid through several certifications Bloomberg has acquired over the years. Other industry standard services will be used as necessary. These services are mostly data providers such as Morningstar, Quandl and Fundsquare.

3 Current State Analysis

This chapter is divided into three distinctive sections: Current State Analysis Interviews, Market Analysis and Key Findings of Current State Analysis. In Figure 2 the researcher has outlined the flow of the research into the current state of things.

Figure 2: Current State Analysis flowchart

3.1 Current State Analysis Interviews

This section will be based on the interviews conducted focusing on the current state of affairs. The researcher conducted two independent interviews for the purpose of this study. The two interviewees were picked from a pool of candidates to provide a historical framework from recent years and to present the current state of investments made in commodities. The interviews were held separately to make sure the answers weren't influenced by external factors especially because one interviewee is the direct supervisor to the other. The interview questions had some variation between the two interviewees, but again this was intentional, because the researcher wished to get two separate perspectives on the matter. The interview data was collected with field notes taken during the interviews.

The first interview was with a senior investment officer in a supervisory role in EAB Group Plc. He described his responsibilities in the company to lead the portfolio man-

agement team to a chosen direction, while acting as a leader and not a manager. He said: “My job is to transform the intent of the board and our CEO into practical actions. I also manager our product portfolio in relation to competition while taking into account our resources, customer base and potential customer base.”

The researcher asked him of any good (or bad) experiences he might have when it comes to investing in commodities and his response was a resound “Bad!”. He mentioned the divergence of Oil and Natural Gas along with other examples and he couldn’t find much good to say about commodities as investments in general. Investing in commodities have developed quite a lot during his career. When asked about the beginning of his career he mentioned that commodities were not really discussed to at all. “In the beginning only a few investors understood what it really means to hold a position in commodities.” he added. According to him in the 1990s the diversification benefits were in the emerging markets, but in the 2000s it was commodities that were discussed when looking for additional return and risk diversification. “Many traders got correlation advantages and diversification benefits.” said the interviewee. The 2009 financial crisis pushed some traders from equities to commodities, which changed the trading patterns of certain commodities and the correlations to equities rose. This was a big change according to the interviewee. When asked about activity in the past few years he said: “In 2015 we started to look at commodities again and created a fund that diversifies in commodities. The performance of commodities in recent years, despite a few exceptions, has not promoted the diversification into commodities. We tried to get excess return with index or ETF -investments”

Overall with his previous employers, commodities weren’t used too much. He mentioned that some trades were executed through emerging market equity investments because there was a high correlation between the two. Lastly the researcher asked the interviewee on how the commodity investments are done currently and what is the selection criteria for commodities. The response was to ask a specific Portfolio Manager who actually manages the only portfolio that currently diversifies into commodities. He also mentioned “I don’t even want to know how commodities are managed currently. If I would – I would be a micro-manager and I don’t want to do that.”

The second interview was conducted after the first one. The interviewee wished to remain anonymous and he was chosen before the first interview was conducted. The specific portfolio manager mentioned by the senior investment officer happened to be the same person who was previously selected to be the second interviewee.

The interviewee is a portfolio manager. He described his duties with the following sentences: “I take part in managing our different equity strategies (systematic and traditional). I’m also partly responsible for our multi-asset strategies that invest in stocks, fixed income, alternatives and commodities. Third party fund selection process is also part of my responsibilities.” His background is in fund selection, specializing in long only and alternative funds and strategies. He mentioned that he has only traded commodities with his current employer.

Forex exposure is hedged, but hedging is done at a portfolio level with ETCs and ETFs, not at a position by position basis said the interviewee. He also mentioned that short positions are not usually taken when hedging commodity positions, but instead the hedging is done by lowering the volatility of the portfolio by diversification into less volatile commodities. Also, arbitrage strategies aren’t used at all, because he doesn’t have the time to sit by and make a dollar here or there.

Decisions are made with a combination of two factors: quantitative analysis and basic fundamentals. In a way the most lucrative commodities are found by quantitative analysis and then fundamental analysis is used on the results to determine the final selection of commodities. Then the interviewee enters one of the futures contracts, usually the one with the most liquidity. He bases his fundamental analysis on commodity news and other news feeds from Bloomberg. He also mentions that he keeps a keen eye on the USDA website for more even more information to help with his decision making. In addition to all this, he also uses commentaries from a selection of asset management firms to guide him through the decision making process. At the grass roots -execution level, he makes his trade decisions based on a loose technical view, which update a quantitative model to give him entry and exit signals to different instruments.

Trading limits and excess margin requirements were both asked in the interview because they are essential for the financial viability of this study. The question on how many futures contracts of any given commodity is currently can be held at once the interviewee responded with a vague description of current practices and trading limits. Currently the portfolio manager checks for two things. Firstly, the maximum exposure is dictated in the mutual funds’ rules. Secondly, he checks the entire commodity exposure on a portfolio level. Then on the question of how much per commodity, he has a couple of rules that he has set himself. 3-4% of a single commodity on a portfolio level is the absolute maximum. To the researcher’s surprise he also has a minimum set limit of

1%. He has set this limit to keep from over-diversifying the portfolio. The interviewee also adds: “It’s also important to consider that in a commodity portfolio it’s important to think how much risk is in the other parts of the portfolio (stocks & fixed income) – which asset class do you want to take risk?”

“What are the excess margin requirements?” is the other key question for the purpose of this study. The portfolio manager shows discomfort in answering this question. He thinks about excess margin (or collateral) as a whole but can’t give a precise answer to the question as he trades several different futures contracts and commodities with varying margin requirements. In the end he musters an answer to the actual question. He points out that in a case of an initial margin being 3 500 USD, he would keep somewhere between 10 000 USD and 13 500 USD of excess collateral as excess margin. In alternative short-term positions he prefers ETFs and ETCs because he can get the cash within a day as opposed to active funds where the money will take several days to get to the account. This is done to minimize the opportunity cost of trading commodities

When asked about the trading costs of commodity futures the answer was simple: “Futures trading is by nature very cost efficient.” Current use of seasonality was described as not being a criterion in the quantitative model this time. Seasonality comes to decision making from fundamental analysis. According to the interviewee he studied quite a few academic journals on commodities and found out that there are a lot of factors that affect the price of a commodity in addition to seasonality. In closing he emphasized that positions are taken with seasonality in mind and trading against seasonality is something he tries to avoid.

3.1 Market Analysis: Competitors

Analysis of competitors is key when assessing the current state of the market. I have divided this chapter into three distinctive topics: What generalized commodity funds have existed in Finland in the past, what generalized commodity funds exist currently in Finland and what commodity funds and Commodity Trading Advisors exist outside the Finnish borders. Overall Commodity funds hold 311 billion USD in assets under management at the end of 2017. (CNBC 2018) In the end of 2017 CTAs hold 354 billion USD in assets under management totaling the financial commodity investments at around 665 billion USD at the end of 2017, unless some CTAs manage the funds with-

in commodity funds, in which case the total figure would be slightly lower. (BarclayHedge 2018)

In addition, the author will attempt to distinguish the key parameters of these funds such as benchmark indexes, investment strategies, costs and performance. This study finds most commodity funds as indirect competition and other funds as substitute products. If the study finds commodity funds that mainly deal with the seasonality of commodities or derivatives trading, they are considered as direct competition.

The funds under analysis in this study have been selected through searches on www.morningstar.fi, www.fundsquare.net and through the Bloomberg Terminal. Mutual funds have several fund series suited for different types of investors; the researcher has picked the fund series most easily available to the general population for best comparability.

The discontinued competition was selected from an internal list of commodity funds that have seized operations. A general study into Finnish commodity funds was done by Aki Vesikallio in 2013. His study will be used for information on funds that no longer have information available. The existing domestic funds selected were selected from the pool of all commodity funds available and then filtered down to funds registered and currently marketed in Finland. The foreign competition was selected through searches on the previously mentioned websites and Bloomberg terminal, the entire pool of over a hundred commodity funds was scoured to pick a select few that would be the closest competition available.

3.1.1 Discontinued competition

The competition as a whole in Finland is in short supply. This study, as already mentioned, focuses on commodity funds. This section takes a look at the commodity funds that have been registered in Finland in the past, but have been discontinued for one reason or another for some time.

The research finds six mutual funds that have been operated by a company registered in Finland, that are no longer operational: Contango Hyödyke Beta, Danske Invest Raaka-aine, ICECAPITAL Commodity, Estlander & Partners Commodity, Eufex Hyödyke and Alandsbanken Sicav Commodity Fund. It is important to find as much

information on these funds as possible to prevent the mistakes that might have been made managing the fund.

Two of the six funds found have very little information available. Contango Hyödyke Beta has been surrendered to Taaleritehdas in July 2012 and merged into Taaleritehdas Commodity Fund. (Arvopaperi 2012) Later, in 2013, Taaleritehdas Commodity was merged with Eufex Hyödyke, which in turn has very little information available and has since been discontinued. It's not possible to determine whether Contango Hyödyke and Taaleritehdas Commodity were indirect or direct competition, but Eufex Hyödyke is a fund of fund rather than investing directly into futures. (Vesikallio 2013, p. 35) Due to this difference, Eufex Hyödyke has to be considered as indirect competition. (Contango Commodity fund rules, 2018)

Danske Invest Raaka-aine began operations on the 22nd of March in 2005. It is by far the oldest of the fund in this listing of funds. Its strategy is to invest in the commodity markets through derivatives and other funds that invest in fixed income products. The fund is meant for the investor, who want to take advantage of the profit potential of commodities. It uses S&P GSCI Light Energy as its benchmark, which is essentially the same index as S&P Goldman Sachs Commodity Index, a general commodity index, but with one fourth of the energy -sector investments. (Danske Bank 2017) The fund was discontinued at the end of 2017. (Danske Invest 2017) This study considers Danske Invest Raaka-aine as direct competition due to the nature of investing through derivatives and the benchmark index being a good general commodity index with less of an emphasis on energies.

ICECAPITAL Commodity was a fund which invested in commodity futures and the excess margin was allocated to fixed income markets. (Vesikallio 2013, p. 35) ICECAPITAL Commodity was a commodity fund that performed relatively well. It had an average profit of 4,5 % between 2006 and 2009. (ICECAPITAL 2010) In 2012 EQ Asset Management acquired ICECAPITAL asset management. (EQ 2013) It has been discontinued since, but it is hard to say exactly when, because there isn't any documentation on its discontinuation. According to Vesikallio, even though seasonality is not mentioned, ICECAPITAL Commodity looks like a fund that might have been considered as direct competition. (Vesikallio 2013, p. 35)

Estlander & Partners Commodity started operations on the 6th of February in 2015. The fund is a systematic strategy investing in 40 commodity markets. It aims to provide in-

vestors with returns through commodity investments throughout the business cycle. (Estlander & Partners 2015) Estlander & Partners have promoted the fund's strategy as investments in commodities through futures contracts. (Estlander & Partners 2016) Seasonality is not mentioned in any documentation, but it is mentioned on the Estlander & Partners blog to be used in commodity analysis. (Estlander & Partners 2015) The fund operated in such a way that it would have definitely been direct competition. Last price data on Bloomberg terminal is for 25.10.2017, after which it seems to have disappeared.

Alandsbanken Commodity Fund is different from the rest. Even though the fund carries a name of a Finnish commercial bank Ålandsbanken the fund itself was registered in Luxemburg. The fund used the CRB Total return index as its benchmark, which represents 19 commodities and caps petroleum products at 33 %. (Alandsbanken 2017) The fund's strategy is based on a proprietary model that identifies risk premiums in commodity markets by studying price trends. In short it is a trend following strategy. The fund factsheet doesn't mention the means of investing, whether it's through funds or direct investments into futures in addition, seasonality is not mentioned in the strategy. It's a safe assumption that Alandsbanken Commodity fund is indirect competition.

Table 1: Specifications of discontinued domestic commodity funds

	Subscription fee	Redemption fee	Ongoing charges	Performance fee	Min. investment
Contango Hyödyke Beta	1 %	1 %	1,00 %		1 000,00 €
Danske Invest Raaka-aine	1 %	1 %	2,18 %		500,00 €
ICECAPITAL Commodity	1 %	1 %	1,00 %		50 000,00 €
Estlander & Partners Commodity B	2 %	1 %	2,00 %	20 %	200 000,00 €
Alandsbanken Commodity Fund	? -5 %	0 %	1,50 %	20 %	10 000,00 €
Eufex Hyödyke	1 %	1 %	1,92 %	20 %	100 000,00 €
Taaleri Commodity Fund	3 %	1 %	1,50 %	20 %	-

Table 1 visualizes the minimum investment required and the fee structure of these funds. The data for Table 1 was extracted from plethora of sources including prospectus and Key Investor Information Documents. Please check product-specific analysis above for references. From this table its quite easy to see that majority of the funds are well above 1% per annum in ongoing charges. This is on par with equity funds' average expense ratios. Investment Company Institute's 2016 report states that the average expense ratio for an equity fund in 1996 was 1,04 %, which fell to 0,63 % in 2016. Equally bond fund expense ratios fell from 0,84 % in 1996 to 0,51 % in 2016. Balanced funds have suffered the same decline in the 20-year period from 0,95 % to 0,74 %. (Investment Company Institute 2016, p. 1) Unfortunately there is no such study done on commodity funds. In terms of risk equity funds are the closest to commodity funds and thus comparing the fees of commodity funds to equity funds' fees is acceptable. On average the funds in this selection had an ongoing charge of 1,58 %, which is more than two times the fee of an average equity fund.

Subscription fees are between 1 % and 3 %. In the case of Ålandsbanken Commodity Fund the fund prospectus states that the subscription fee can be up-to 5 %, however

the actual fee was lost as the fund has been discontinued. Disregarding Alandsbanken's fund the average subscription fee is 1,5 %, with most funds being at 1 % subscription fee. Redemption fee is almost a standard at 1 % in this dataset as Alandsbanken Commodity Fund is the only outlier at 0 %. Most of the funds also boast a hefty performance fee at 20 %.

The biggest variance in this dataset is definitely at the minimum investment column. Some funds, such as Contango Hyödyke Beta, Danske Invest Raaka-aine and Alandsbanken Commodity Fund were relatively reachable for an individual investor all at below 10 000 € minimum investment. ICECAPITAL Commodity, Estlander & Partners Commodity and Eufex Hyödyke had a large minimum investment going from 50 000 € all the way to 200 000 €. These funds were clearly not meant for the small individual investors but instead for larger companies and institutional clients. Taaleri Commodity Fund's information on minimum investment has been lost due to the fund being discontinued.

It's hard to pinpoint the exact reason why any fund has seized operations, but generally a fund is discontinued due to poor performance, a merger, an executive decision or because the amount of capital falls below a certain level required for effective portfolio management. Eufex Hyödyke had a relatively bad performance history before its discontinuation in 2013. It did -11,2 % a year for the last year of operations. (Rahastoraportti 2013) In 2015 Danske Invest Raaka-aine had four million euros in assets under management, at the time of its dissolution in 2017 it had 3,2 million. (Rahastoraportti 2015) Performance for the fund was a disappointment at -9,7 % per annum for the past 10 years. (Rahastoraportti 2017) Estlander & Partners Commodity was a short lived fund with a performance of -10,4 % in its final year of operations. (Rahastoraportti 2017) These few examples tell a story: some funds in this study were discontinued due to mergers, but mostly prolonged poor performance can be pointed out as the main reason for the discontinuation.

3.1.2 Existing domestic competition

Current domestic competition is just as scarce as the discontinued competition. There are only a few providers that have commodity funds at all. At the time of writing, in July 2018, there are five domestic commodity funds in existence. Two are operated by smaller asset management firms: Estlander & Partners Resources and Zenito Silver &

Gold. The remaining three are operated by large corporate banks: OP-Raaka-Aine, Aktia Commodity and Handelsbanken Raaka-ainerahasto.

OP-Raaka-aine A is a commodity fund, established on the 5th of April in 2004, that invests its funds to the commodity markets and commodity producing companies. (Vesikallio 2013, p. 34) Majority of the funds are invested through commodity derivatives. The fund's benchmark index is Bloomberg Commodity Index Euro Hedged Total Return, but the fund's Key Investor Information Document states that the contents can differ a lot from the benchmark. (OP 2017) Seasonality is not mentioned anywhere on the prospectus, thus OP-Raaka-aine is considered as indirect competition.

Aktia Commodity started its operations on the 4th of February in 2016. The fund's strategy is to combine commodity instruments with profit potential mainly through investing in commodity funds. Different strategies enable efficient risk management. (Aktia 2017) The benchmark used by the fund is S&P GSCI Light Energy, which is the same index as Danske Invest Raaka-aine was using. The top investment made by the fund is Estlander & Partners Resources at 59,3 % of the fund's total value. (Aktia 2018) For the purpose of this study, this fund should be considered as indirect competition as it doesn't mention seasonality in any of the documents.

Handelsbanken Raaka-ainerahasto A EUR is a commodity fund that started operations on the 5th of July in 2010. The fund invests according to the SHB Commodity Index Excess Return Index. (Handelsbanken 2018) The index consists of a large variety of commodities, 15 in total. Investments are done mostly through futures contracts. Handelsbanken Raaka-ainerahasto is registered in Luxemburg, exactly as Alandsbanken Commodity was. Seasonality of commodities or other investments is not mentioned in the strategy or prospectus, this in addition to the index following would indicate that seasonality is hardly the main driver for this fund. The researcher finds this to be indirect competition.

Estlander & Partners Resources started operations on the 10th of November in 2017. It's a fund that specializes in commodities. They aim to capture the best roll-yield backwardation opportunities within the fund. The fund is very liquid with a daily aftermarket. Their average correlation to the Bloomberg Commodity index is around 90% (Estlander & Partners 2018) Estlander & Partners fund prospectus also mentions that their strategy is a systematic trend following strategy with some fundamental analysis. For the purpose of this study, the prospectus doesn't mention the use of seasonal pat-

terns which would indicate that the fund is not actively looking for seasonality, thus the researcher finds it indirect competition. (Estlander & Partners 2017)

Zenito Silver & Gold A started operations on the 25th of January in 2016. This fund's name already specifies the main commodities it invests in: Silver and Gold. Primarily the fund aims to beat the MSCI ACWI Metals and Mining -index. (Zenito 2018) This fund prospectus states the strategy as investing in publicly traded company stocks, whose business is mainly in precious metals, in the mining industry or the refinement industry. (Zenito 2018) This fund cannot be considered as direct competition due to the specific nature of the fund. They mention the basis for creation of this fund to be the all-time-low P/B values of this industry's publicly traded stocks in 2015. More than 90% of the funds are invested in stocks in a normal market scenario. (Zenito 2018) Seasonality of commodities seems to play no role in the portfolio management of this fund.

Table 2: Specifications of existing domestic commodity funds

	Subscription fee	Redemption fee	Ongoing charges	Performance fee	Min. investment
OP-Raaka-aine A	1 %	1 %	1,87 %		- €
Aktia Commodity A	1 %	1 %	1,43 %		50,00 €
Handelsbanken Raaka-ainerahasto A EUR	1 %	1 %	0,75 %		15,00 €
Estlander & Partners Resources	1 %	0 %	1,50 %		1 000 000,00 €
Zenito Silver & Gold A	1 %	0 %	1,20 %	12 %	100,00 €

Table 2 visualizes the specifications of existing domestic commodity funds. In comparison to the dataset of Table 1, most of the fees are lower in the existing funds than in the discontinued funds. The data for Table 2 was extracted from a plethora of sources including prospectus and Key Investor Information Documents. Please check product-specific analysis above for references. Subscription fees have standardized at 1 %

while redemption fees still play a similar role either at 1 % or non-existent. Estlander & Partners is the only company who have delved twice into the commodity investments

Ongoing charges in the discontinued funds were on average at 1,58 %. Investment Company Institute's report stated that equity funds' average expense ratio declined from 1,04 % in 1996 to 0,63 % in 2016. The decline is in line with the decline from discontinued expense ratio of 1,54 % to the existing community fund expense ratio averaging at 1,35 %. Performance fees have disappeared almost completely. Only Zenito Silver & Gold has a performance fee at 12 %, which in itself is already lower than any performance fee in the discontinued funds.

Most significant change is the change in minimum investments. Majority of the funds are easily accessible to the average joe at under 100 € with the exception of Estlander & Partners Resources. It is clearly meant for big companies and institutional investors with a minimum investment of 1 000 000 €. Companies are fighting for customers in the financial sector now more than ever. Interest rates are no longer providing banks with enough steady income and competition is fierce. Lowering the minimum investment and fees is a clear indication of heightened competition. ETFs, Index funds and other substitute products with lower costs are plentiful and assets might have moved to lower-cost funds. (Investment Company Institute 2016, p. 1-2)

The previous chapter established that the majority of discontinuations happen after poor performance or mergers. Aktia Commodity only has a year of track record and it's not too bad. +7,1 %. (Sijoitustutkimus 2018) Handelsbanken Raaka-ainerahasto has not done so well, over the past year, it has managed to do an amazing job at +23,8 %, but overall last 5 years have gone by at a mediocre -3,1 % per annum. (Sijoitustutkimus 2018) As the last example, OP-Raaka-Aine is by far the worst. -11,9 % for the past 10 years per annum. It's a surprise this commodity fund is still standing. No clear conclusion can be drawn from looking at the performance track records of these funds. (Sijoitustutkimus 2018)

3.1.3 Existing foreign competition

There is plenty of existing foreign competition, especially when comparing with the peer group of the existing domestic competition. Industry standard research websites such as Morningstar.com and Fundsquare.net reveal the amount of competition to be be-

tween 100 and 200 funds and 500 to 600 ETFs. This section is not going to focus on the 600+ products and their specific information, but instead the researcher attempts to select a handful of the most relevant funds to be considered as best-fit competition. Table 3 visualizes the fee structure of each fund and ETF, along with minimum investment required. The data for Table 3 was extracted from a plethora of sources including prospectus and Key Investor Information Documents. Please check product-specific analysis below for references.

Table 3: Specifications of existing foreign commodity funds and ETFs

	Registered in	Subscription fee	Redemption fee	Ongoing charges	Performance fee	Min. Investment
WisdomTree Enhanced Commodity ETF	London	0,00 %	0,00 %	0,35 %	0 %	10 $
WisdomTree (Green-Haven) Continuous Commodity Index Fund (ETF)	U.S.	0,00 %	0,00 %	0,75 %	0 %	19 $
USCF SummerHaven Dynamic Commodity Strategy No K-1 Fund (ETF)	NYSE	0,00 %	0,00 %	0,80 %	0 %	22 $
Horizons Seasonal Rotation ETF	Toronto	0,00 %	0,00 %	0,93 %	20 %	20 $
Threadneedle Enhanced Commodities	Luxemburg	5,00 %*	0,00 %	2,05 %	0 %	2 500 €
Fulcrum Commodity Fund A	Luxemburg	5,00 %	2,00 %	2,00 %	10 %	10 000 $
Schroder Alternative Solutions Commodity Fund	Luxemburg	0,00 %	0,00 %	2,93 %	10 %	10 000 €
PIMCO TRENDS Managed Futures Strategy Fund	U.S.	5,00 %*	0,00 %	2,25 %	0 %	1 000 $

*Maximum subscription fee

The researcher searched Morningstar for the top 4 ETFs and selected the following: WisdomTree Enhanced Commodity ETF, GreenHaven Continuous Commodity Index Fund, USCF SummerHaven Dynamic Commodity Strategy No K-1 Fund and Horizons Seasonal Rotation ETF. Top 3 commodity funds were selected also through Morningstar with the help of Fundsquare and they are the following: Threadneedle Enhanced Commodities, Fulcrum Commodity Fund and Schroder Alternative Solutions Commodity. These were selected after researching the investment strategies of around a hundred ETFs and commodity funds. PIMCO TRENDS Managed Futures Strategy Fund was selected into this list of contenders even though it's neither an ETF but a managed futures commodity fund, in addition it's investment strategy seemed very interesting.

WisdomTree Enhanced Commodity ETF is an exchange-traded fund that tracks the performance of the Optimised Roll Commodity Total Return. The benchmark index aims to give the investor a broad exposure to a basket of commodities. These commodities include all commodity classes (Energies, Metals, Softs and Agricultures). This instrument was selected, because it is by far the cheapest option to invest in a broad basket of commodities at 0,35% a year. For the purpose of this study it is considered as indirect competition. (WisdomTree 2018)

WisdomTree (GreenHaven) Continuous Commodity Index Fund is an exchange-traded fund that tracks the Thomson Reuters Equal Weight Continuous Commodity Total Return Index. Its intent is to track it using futures contracts. It is a 10-year-old ETF with a relatively bad track record but it provides an excellent weight equal basket of commodities that is worth looking. This study finds the ETF as indirect competition. (WisdomTree 2018)

USCF SummerHaven Dynamic Commodity Strategy No K-1 Fund is an exchange-traded fund that follows its namesake index, SummerHaven Dynamic Commodity Index. The index is comprised of 14 different commodity futures, which are chosen from 27 eligible commodities. The index specifies six commodity sectors and weights the 14 commodity futures at equal weights across Energies, Precious Metals, Industrial Metals, Grains, Livestock and Softs. This fund was selected because of its use of futures contracts. Upon review of the fund strategy, the researcher finds this fund as indirect competition. (Uscfinvestments 2018)

Horizons Seasonal Rotation ETF is one of the most interesting investment products the researcher has ever seen. It isn't a commodity-only fund, but it's investment strategy is quite interesting. Horizons Seasonal Rotation uses a system that rotates different types of investments in and out throughout the year. According to their product sheet, professionals tend to favor more defensive stocks between May and October. This is seasonality at its core. Even though this ETF invests in the equity markets along with the credit markets, this has to be considered direct competition due to the nature of its investment strategy. (Horizons ETFs 2018)

Threadneedle Enhanced Commodities is a commodity fund that utilizes a strategy that invests in commodities through derivatives. Its goal is to bring in more money by taking both long and short positions in the derivatives markets. This fund is one of the few that don't aim to track an index, but instead they do take Bloomberg Commodity index as a reference index to benchmark the funds' performance against. The Key Investor Information Document brings to light a flaw in this fund: "It is not intended that the use of derivatives will result in any net short position in commodities". Which essentially means that the asset manager doesn't intentionally take short positions. The investment strategy as a whole reveals this fund to be the kind that is considered as direct competition. (Morningstar 2018)

Fulcrum Commodity Fund is a commodity fund that prides itself on being a systematic approach to commodities. According to the Key Investors Information Document, it's investment policy is quantitative. It looks at all of the commodity classes and attempts to seize value in trending situations while maintaining the capital in sharp market selloffs. For optimal asset management, the fund can invest outside the commodity market to other derivatives. The researcher finds Fulcrum Commodity Fund as indirect competition, because it uses a quantitative, systematic approach to commodities. (Fundsquare 2018)

Schroder Alternative Solutions Commodity has an exposure to a broad range of commodities. It primarily invests through futures. The investment strategy is to detect trends forming in the investment universe of 64 commodities. The strategy is complimented by fundamental, technical and sentiment analysis to maximize profits over time. This fund is a long only fund as the marketing material explains that the fund does not engage in short positions. For the purpose of this study, this fund is considered as indirect competition. (Morningstar 2018)

As mentioned PIMCO TRENDS Managed Futures Strategy Fund is not an ETF but a commodity fund managed futures. It's investment strategy differs from others because it looks at the historical volatility and averages to formulate the basis for decisions. It can take trades in both short and long. It can't be considered as a commodity fund because the Key Investor Information Document mentions that it can make investments in equities, fixed income and volatility products. However, the investment strategy seems to be somewhat close thus this study finds it as a substitute product. (Morningstar 2018)

By nature, ETFs are a different kind of an investment than traditional commodity funds. An outstanding example is the minimum investment for ETFs which is the value of the ETF, hence why Table X shows such low minimum investments for the ETF products. At the same time the foreign commodity funds have a minimum investment of just under 6 000, regardless of currency.

Subscription fees are 0 % with almost all of the selected funds with the exception of Threadneedle, Fulcrum and PIMCO TRENDS. Threadneedle and PIMCO TRENDS mention in their Key Investor Information documents that 5 % is the maximum fee, but there is no mention about what is the current subscription fee. Redemption fee is only applicable with Fulcrum Commodity Fund at 2 % with the rest sitting at 0 % redemption fee. Performance fees are almost non-existent in ETFs with the exception of Horizons HAC that has a massive 20 % performance fee. Half of the commodity funds have performance fees at 10 % and half of them don't have performance fees at all.

Ongoing Charges have to be split up into two categories between the ETFs and the traditional funds. ETFs average the ongoing charges at around 0,70 % while the commodity funds average at around 2,30 %. The purpose of this study is to research whether a commodity fund can be created around seasonality or not, thus the ETFs are dismissible in terms of their cost structure as a commodity fund can't achieve the same kind of cost effectiveness.

Performance comparison between the selected funds was covered in previous sectors for the domestic funds. Below are price-data charts for the foreign competitors with the S&P 500 index for reference. Prices were extracted on July 12, 2018 and indexed to 100 at the beginning of the period. The values are all in the same currency (USD) to make them comparable.

Figure 3: Price of foreign funds and ETFs between 12.7.2017 - 12.7.2018

Data for Figure 3 was taken as an example of the yearly performance of the selected funds and ETFs. S&P is at the top with a return of around 14 %, Horizons Seasonal rotation is not far behind at around 10 %. Bottom two in the past year were WisdomTree Continuous Commodity Fund at around -2,7 % and USCF SummerHaven at almost -4 %. The average return is +2,78 % for the past year.

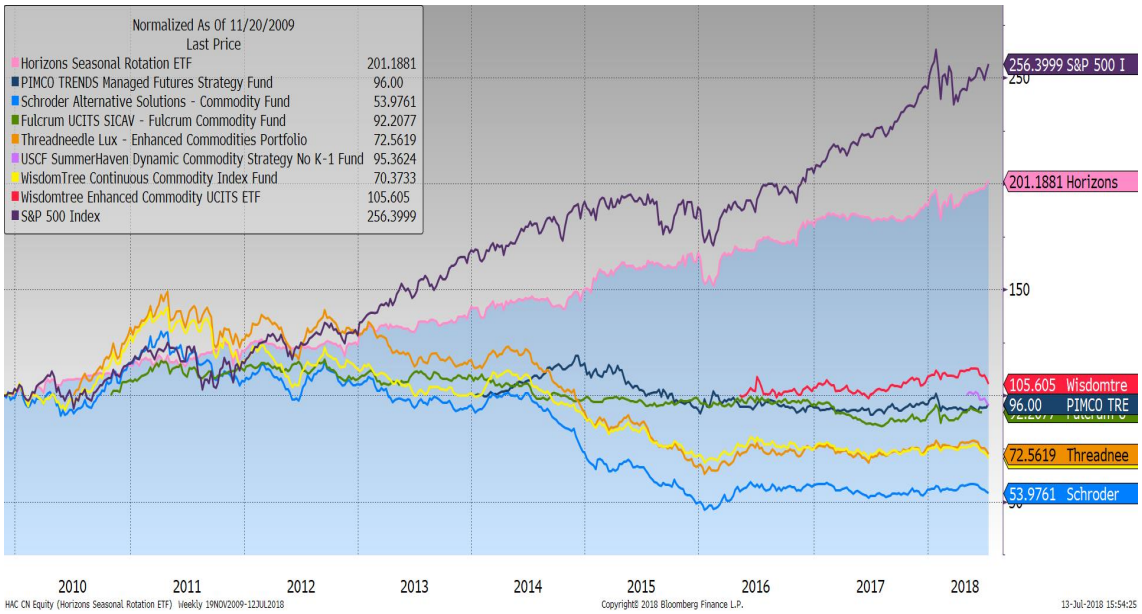

Figure 4: Price of foreign funds and ETFs between 19.11.2009 - 12.7.2018

Figure 4 aims to visualize a long term trend of the selected funds and ETFs in this study. The beginning date was selected because most of the products were in opera-

tion at that time; it is also the starting date for Horizons Seasonal rotation. If one was to invest 100 dollars at the beginning of the period to S&P he would have 256 dollars today (12.7.2018). On average the selected products are at -1,6 % over the course of the period, which is almost 9 years. This result is tilted by the mostly equity fund Horizons Seasonal rotation, the average is -16,27 % over the period without accounting for Horizons, which is less than flattering for the group.

3.2 Commodity Trading Advisors

Commodity Trading Advisors, or CTAs, are professionals who offer advice on derivatives trading along other services such as managing a futures account. Traditionally when an individual investor wants to invest into commodities the easiest way is to invest through a commodity fund or to purchase physical commodities, such as a gold bar. The history of CTAs was indeed in commodities, but later their role widened significantly. In terms of investing most CTAs today are similar to hedge funds as they might even use the same strategies. (Gregoriou 2008, p. 93) Managed Futures is another term used for CTAs who invest the client's money with a power of attorney. These discretionary managed accounts are often a small portion of the individual's wealth. (Melin 2010, p. 73-74)

The fee structure of a CTA differs from a Commodity funds' fund structure significantly. When investing through a CTA an individual is often presented with 3 options: 2/20, 1/25 and 0/30. The first number signifies the ongoing charge per annum and the second number indicates an incentive percentage. It is best explained with an example: If a fund yields 5 % in gross return, with a 2/20 fee structure the total fees would be 2 % + ((5 % - 2 %) * 20 %) = 2,60 %. With 1/25 and 0/30 the fees would end up slightly lower at 2 % and 1,5 % respectively. In short, this means that the fees for a CTA services or a managed futures account is very high in comparison to a generic commodity fund. (Managedfuturesinvesting 2014)

Study into CTAs reveals an interesting fact about redemption times. Preqin Hedge Fund Spotlight from March 2018 states that managed futures and CTAs have a median redemption frequency of 14 days and notice has to be given 7 days before redemption. (Preqin 2018) This is definitely something that sets CTAs apart from commodity funds. In a typical commodity fund no notice period is required and funds are available as soon as the bank transfer has been finalized.

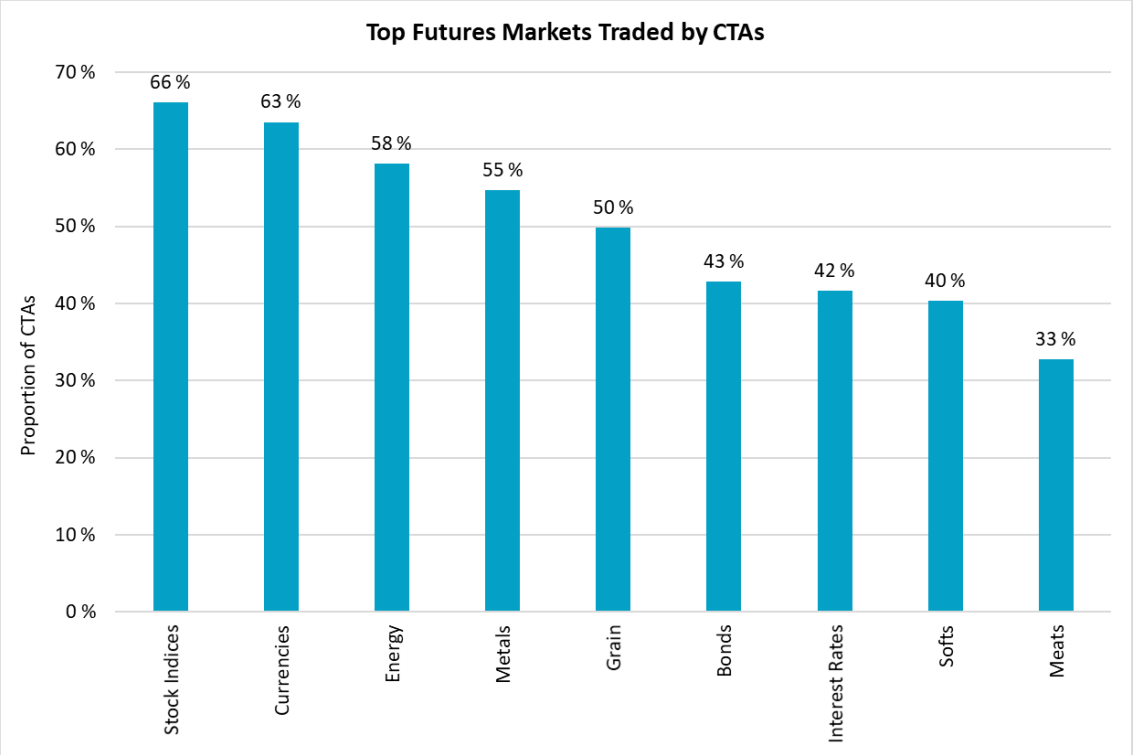

Figure 5: Top Futures Markets Traded by CTAs (Preqin 2017)

The final nail to the CTA coffin is in Figure 5. 66 % of the CTAs trade equities, 63 % Currencies with the first category of commodities, energies coming in third at 58 %. This is by no means different from the funds and ETFs covered in sections 3.1.1 and 3.1.2. The investments made by any single CTA are not public knowledge and taking into account the huge variance between the contents of CTA's portfolios, there is no way to say for sure what CTA is investing in commodities, let alone using seasonality as a basis for decisions. Thus for the purpose of this study managed futures are not considered as competition but rather as substitute products.

3.3 Strengths and Weaknesses of Current Practices

As an asset management company we don't have a dedicated commodity fund. Which means our current practices are only based on the single fund that deals with commodities. The interview with a portfolio manager revealed that commodities are only used in a specific fund and with a minority position overall within the fund. Therefore, this section on Strengths and Weaknesses of Current Practices will mostly focus on the competition and their Strengths and Weaknesses.

ETFs have two main strengths over mutual funds. ETFs are cheap to maintain and thus the fees are significantly lower for investors. Firstly, the lowest ongoing cost for an ETF in this study was at 0,35 % p.a. that's 0,40 % less than the already very cheap Handelsbanken Raaka-Aine. Secondly ETFs are not only easily accessible for investors with a low barrier for entry, but also they can be turned into cash quite quickly as they are very liquid. Managed Futures thrive with execution as the Commodity Trading Advisors are actively trading at all times. The downside for CTAs is the high cost that comes with it. A minimum of 2 % with 20% in performance fees is too much for many investors.

Mutual funds land somewhere in the middle. There are relatively cheap commodity funds at less than 1 % in ongoing charges per annum, but on the other hand there are some that charge almost three times as much. Pricing is neither a strength or a weakness of a commodity fund. Most commodity funds are semi-liquid with redemption dates weekly, bi-weekly or monthly. Mutual funds strength lies in actively managed portfolios.

3.4 Key Findings of Current State Analysis

Current State Analysis began with assessing the current state of Commodity trading within the company. The researcher conducted two separate interviews to assess the current state and the history of investing in commodities from the interviewee's perspective.

The interviews revealed that the company had not done too much commodity investing in the past, but is conducting some now through a single fund as a part of its strategy. In history, commodity investments were considered bad due to the big uncertainty and volatility surrounding them. Commodities are considered to have high correlation with emerging markets, thus not a focus for the company. The second interviewee was a portfolio manager, who manages the only fund that deals with commodities. To the researcher's surprise, he had only traded commodities with this single fund and had no prior experience trading commodities. Commodities are only a part of his multi-asset strategy used in the fund and thus don't get as much attention as the might require. The interviews also aimed to find strengths and weaknesses of current practices, but unfortunately as it seems – there are no set current practices for the company.

Domestic competition within the commodity funds is mediocre at best. Overall the domestic market is sort of a niche market where a few players try to grab market share but as history shows many have failed. It seems like the only focused domestic competition is Estlander & Partners Resources. The fund is perhaps an improved successor to Estlander & Partners Commodity. It seems to be too-good of a coincidence that it was discontinued on the 25th of November and Estlander & Partners Resources began operations on the 10th of November. The rest of the domestic competition either offers a focused portfolio in a commodity category such as Zenito Silver & Gold, or a broad exposure to the commodity market with no focus. The researcher finds Estlander & Partners Commodity to be the closest competition from the discontinued funds, Estlander & Partners Resources as the toughest competition from the current peer-group. Foreign competition looks quite tough. In terms of strategy Horizons Seasonal Rotation is the best comparable competition, but it mostly consists of equities and is definitely an outlier in Figures 3 and 4. Best foreign competition overall is a tie between Fulcrum Commodity Fund and Threadneedle Enhanced Commodity Fund.

Minimum investments for the foreign commodity funds are a quite varied with the average amount, regardless of currency, being just under 6 000. Current domestic products most have their minimum investments at or below 100 € and most of the discontinued products boasted at more than 10 000 €. A conclusion drawn from this points to an optimal minimum investment being somewhere between 5 000 € and 10 000€.

Majority of the subscription fees were at 1 % across all of the studied funds, although some where higher and some were lower, even at 0 %, it's safe to say that majority of the client are able to pay a 1 % subscription fee. Redemption fees were at 1 % on majority of the discontinued funds, but it seems that the redemption fees are disappearing. In current foreign and domestic competition only a few funds had a redemption fee. Redemption fees have vanished and a conclusion could be drawn that redemption fees belong to the last century and shouldn't be applied today. Performance fees seem like they are either used or not used, both now and in the discontinued funds. Some funds have 0 %, others have 10 % and some even have 20 % mentioned as performance fees. This study finds any of them applicable. The researcher can't distinguish a pattern emerging from the funds researched for this study.

The current state analysis finds the ongoing charges to average between 1,35 % for current competitors and 1,58 % for discontinued competitors. Within equity mutual funds, expense ratios seem to be higher if the fund specializes in a specific area or a

sector. (Investment Company Institute 2016) Even so, the ongoing charges are relatively low within the commodity funds in Finland as the study finds the average for current competitors globally to be 2,30 %. Investment Company Institute's research on expense ratios seems to be a very broad average and the earlier assumption of using equity fund expense ratios as something comparable to commodity fund expense ratios doesn't seem plausible. A conclusion can be drawn from these data points: The study finds ideal ongoing charges -pricing strategy to be between 1,30 % and 2,30 %.

Even though CTAs can't be considered as competition their fee structure is worth taking a look at because purely trading the seasonality of a selection of commodities is, as a process, the same as what most CTAs are doing. Their fees are roughly twice as much as the fees of a traditional commodity fund. In terms of the fee structure would it be reasonable to position a seasonality based commodity fund somewhere in the middle of traditional commodity funds and CTAs? This is a question that the author will answer in chapter 5.3.

Performance of commodity funds is historically bad. Many commodity funds tend to either make no profit at all or even worse, make a loss. Only three of the products selected were profitable over their entire lifespan: Estlander & Partners Resources, Aktia Commodity Fund and WisdomTree Enhanced Commodity ETF. All three have less than two years of history.

Margin-to-equity was a ratio discovered while researching Estlander & Partners funds. An account with 1 000 USD in required initial margin and a total of 5 000 USD on the account has a margin-to-equity ratio of 20% (5000/1000). Estlander & Partners mention in their fund prospectus that their funds must have a margin-to-equity ratio of below 50 %. On average Estlander & Partners Commodity had a margin-to-equity ratio of 15% (Estlander & Partners 2016, p. 16) while their new fund Estlander & Partners Resources has an average margin-to-equity ratio of 20%. (Estlander & Partners 2018, p. 13) This ratio was also one of the questions asked in the current state interviews from a portfolio manager, to which he replied that for every 3 500 USD required in margins he keeps around 10 000 USD to 13 500 USD in excess capital. Which would mean a ratio between 35 % and 25 %, which in comparison to Estlander & Partners is rather high. It's clear that Estlander & Partners operate with more margin risk than of that recommended by Daniels Trading. The interviewed portfolio manager is even more cautious than maybe required. From these data points we may draw the conclusion that a figure between 15% - 35% is ideal.

4 Existing Knowledge

In this chapter the researcher will guide the reader through the published research literature on the topic. There is a considerable amount of literature written about mutual funds, commodities, futures and other related topics. Firstly, the researcher will define the scope of the existing knowledge under review and exclude any literature that is irrelevant for this study. The main body of chapter 4 is an analytical take on the topic defined in the beginning of the chapter. Lastly the researcher will summarize the key findings, ties between findings and create a conceptual framework.

4.1 Literature Review

Objective and critical. Those are the two adjectives that most researchers work with when conducting a literature review. Literature review is supposed to be a critical summary of published research material. It must be done with an objective mindset to achieve its goal: to create understanding around the topic based on academic research. The purpose of this section is to define the scope for the research under review.

Investing in commodities is typically done in one of two ways. An individual can purchase the commodity as a physical product. The best example of this is an investor buying gold bullion. The second option for an individual to invest in commodities is through derivatives such as futures or options. Options may be a good way to invest into commodities, but because of their complexity in this study we are going to focus on futures. One could also invest in commodity-producing companies through a stock exchange, but for the purpose of this study we aren't going to explore that option. Seasonality of Commodities is in the center of this Thesis and will be covered in chapter 4.4.

Current State Analysis revealed a few topics that warrant further research into the literature. Financial requirements, in particular margin-to-equity ratio was brought up earlier and it will be reviewed further. Currency exposure hedging can affect the profit or the loss of a mutual fund by a decent margin and review into literature is necessary for the sake of this study. This review will also look into the various pricing strategies employed by mutual funds, but exclude ETFs and CTAs, because they are not relevant to the business challenge.

Literature around some of the topics mentioned is scarce, especially literature on seasonality is mostly limited to a few articles and websites. Books on seasonality of commodities are guidelines with charts including dates for entries and exits.

4.2 The History of Futures

Futures were invented in ancient Japan when landlords collected taxes in the form of rice. Rice was then trader for cash in Osaka. To ease the tax collection, the Japanese invented a standardized contract that had an aftermarket – an early version of the futures contract today. (Vesikallio 2013, p. 6-7) Futures trading in its current form was born in Chicago in the mid-1800s. Mark Sachs describes futures as the following "A futures contract is an obligation to buy or sell an underlying product at a specific price at a specific time in the future." (Refco 2005)

In the 1840s the reputation of Chicago rose to eventually become the hub of commodity trading for agricultural farmers in the United States. In 1848 a group of grain traders decided on a central location where they, among others, could buy and sell grains. This is considered to be the grass roots of CBOT and on 13th of March in 1851 the first forward contract was written. Later, in 1865, the contracts for various grains such as oats, wheat and corn became standardized. At the end of the century, in 1898, CME was formed to facilitate trade for other agricultural products like eggs and potatoes. Over the next century CME grew to the giant it is today offering futures for equity indexes, interest rate products and various other derivative products. (Butcher K., 2013, p. 3-6)

4.3 The Use of Futures

Futures contracts are mainly used to facilitate hedging or speculation – they allow the commodity producers and commodity refining companies to establish prices well in advance. This helps the companies forecast cash-flow and keep the companies running more efficiently. Often the speculators bear the risk that is passed on from the hedgers in hopes of big profits. Investors prefer the use of commodity futures contracts because they provide a relatively inexpensive and liquid way to invest in certain commodities or markets. (Ederington 1979, p. 157)

Futures are a way to invest in the future price changes of the underlying product. Futures have a characteristic that differentiates them from any other market; a delivery date. If one was to purchase a futures contract, he would be liable to purchase that underlying product at a later date at the price he or she purchased the contract. This standardized contract allows investments to be made many months or even years into the future. The quarterly delivery months (March, June, September, December) are most commonly used when trading futures contracts, with the exception of agricultural products that tend to cycle as the harvests are collected.

Futures share the same advantages as stock markets: high liquidity, contracts specifications and terms are uniform, pricing transparency and secure trading. Evidently futures have disadvantages that other asset classes don't have. Volatility is even higher than traditional equities and the price fluctuations are prone to changes in weather, supply & demand and different economical events both nationally and internationally. (Du, S. 2005)

An investor can take two types of positions when trading futures, long and short positions. A simple example of a long position: You buy December 2018 Corn contract when its trading at 320 cents per bushel. A single corn contract consists of 5000 bushels of corn (~127 metric tons). By purchasing this contract, you have entered into an agreement to purchase 5000 bushels of corn at the expiry date, which is a day prior to the 15th of December 2018, at a price of 320 per bushel. This means the total value of the futures contract is 3,20 USD * 5 000 = 16 000 USD. The minimum price fluctuation, a tick, in corn is ¼ of one cent per bushel and accounts for a 12,50 USD according to CME Corn contract specifications. (CME 2018) If the price would go up to 330 cents per bushel and you decided to liquidate your position, you would gain a profit of 10 (amount of price fluctuations) * 4 (¼ of one cent) * 12,50 = 500 USD. If the price would move against you, you would end up losing money dependent on how much it moved. For example, if the price moved down to 310 cents per bushel the loss would be of equal size as the previous example of making money. (Refco 2005)

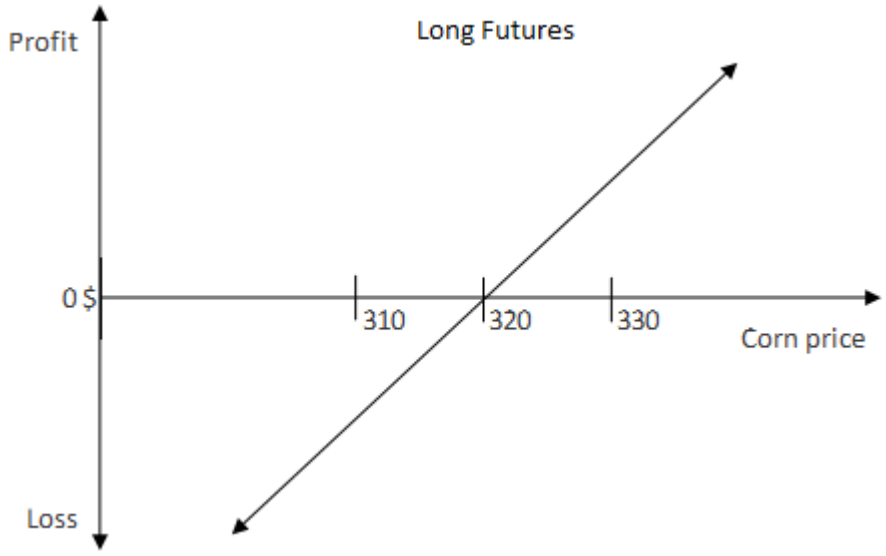

Figure 6: Profit / Loss graph when entering a long futures contract

Figure 6 aims to illustrate the profit / loss situations of a long corn position. As the price of corn increases, the profit increases linearly and vice versa.

Short position is the opposite of a long position. You could sell a security, betting for its price to decrease over time. Selling a security without actually having it may sound like a strange idea but in terms of futures, taking a short position actually means that you are obligated to, not buy, but to deliver the said commodity at the expiry date. If you would enter into a short position at 320 cents per bushel in the same contract and the price would go to 330 cents per bushel, you would incur a loss of the same size as you sold liquidated your position. However, if the price would go down to 300 cents per bushel, you would gain a total of 1 000 USD. (Refco 2005)

Figure 7 illustrates the profit / loss situations of a short position. As the price of corn decreases, the profit increases linearly and as the price of corn increases, so do the losses.

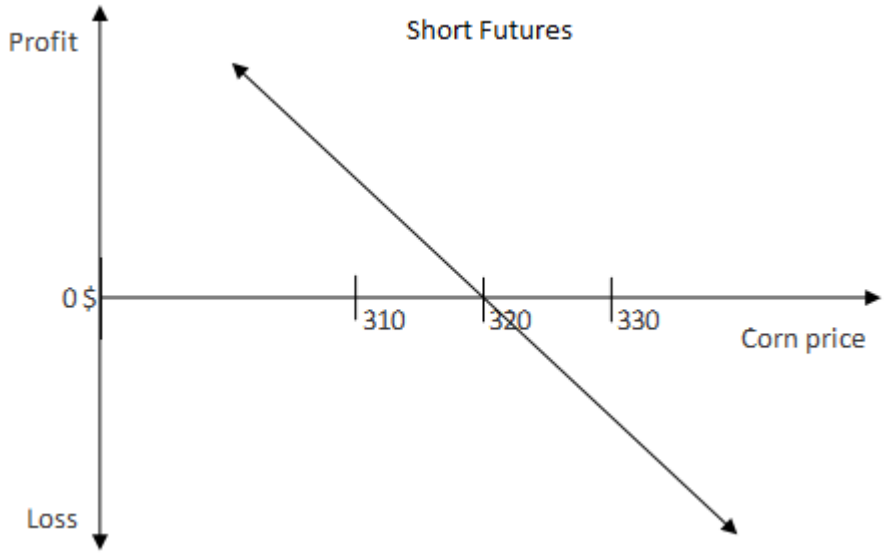

Figure 7: Profit / Loss graph when entering a short futures contract

4.4 Seasonality of Commodities

Seasonality is a factor in commodities whose price patterns are affected by cyclical demand or supply. (Clenow, Clenow, et al. 2012, p. 32) In other words seasonality is repetitive price movement bound by a specific period of time. In this chapter we are taking a look at what are seasonal commodities and what does the existing knowledge say about them. Seasonal commodities weren't prevalent in mutual funds, ETFs nor CTAs according to the Current State Analysis.

"Past performance is not indicative of future results" is the most common legal sentence in any mutual fund prospectus or marketing material. The idea behind seasonality is to work in the exact opposite way. Past performance is embraced and studied so carefully that trading signals are derived from past performance. Building of a seasonal strategy starts with understanding how any market works. For agricultural products, such as corn, it means understanding the growth cycle of corn. Seasonal patterns that last for more than a month are the most reliable as they are based on fundamental effects. Seasonal patterns in corn exist out of fear for crop damage and relief of a decent crop on the short side. (Ruggiero, Murray A., Jr 2002)

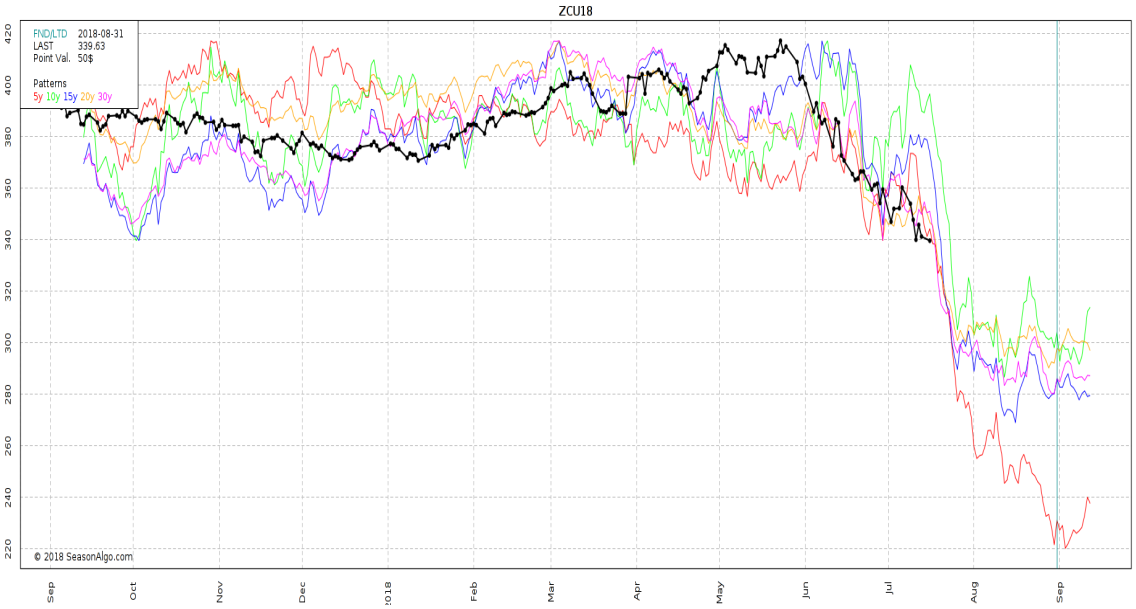

Figure 8: Corn Seasonal Patterns & Corn Sept18 future price (Seasonalgo 2018)

Figure 8 shows the price action of September 2018 corn future in black. The other colors are the 5-year, 10-year, 15-year, 20-year and 30-year seasonal patterns for September corn contract. It is clear from Figure 8 that corn prices tend to decrease between mid-June to mid-August. Seasonal patterns are non-existent in some commodities, such as metals, however agricultural products and crops follow a seasonal pattern due to harvest-fear and harvest-relief explained earlier. (Milonas, N.T. 1991) An interesting idea on seasonality comes from Murray Ruggiero as he points out T-bonds to be one of the most seasonally dependent markets. According to Ruggiero T-bonds are fixed income products with a special time each year of tax-related selling from February until mid-April. (Ruggiero Murray A., Jr 2002)

Seasonality has picked up in recent years and several websites have manifested around the topic. Moore Research Center Institute, or MRCI, claims to have experience from trading since 1989. Nowadays they provide a subscription service surrounding the seasonality of commodity futures. Seasonalgo.com offers a similar service with a similar pricing model as MRCI. Seasonalgo is definitely a more modern site with a lot of functionality and thus might be considered to be used when building the proposal in chapter 5.

“Know them and respect them. But don’t let trends be your only pricing guide.” says Ed Usset, a University of Minnesota professor in an article from 2012. Later in the article he mentions that farmers today should keep an eye out for seasonal price trends as

opposed to ignoring them. (Stalcup, L. 2012) Seasonality is flourishing in commodities and seasonal tendencies is can be an impressive repository of information for investors if used correctly. One must remember that an opposite force can come and overcome the seasonal tendency. James Cordier and Michael Gross suggest to use seasonal tendencies as a tool, but warns to take them at face value and as the only trading signal. (Cordier, J. & Gross, M. 2015)

4.5 Defining the Margin-to-Equity Requirements

Margin-to-Equity is used to identify and manage risk. Mark Melin wrote a book in 2010 on managed futures and its potential to diversify a portfolio. Melin (2010, p. 208) mentions that a margin-to-equity ratio of 70 % can be interpreted as a very risk trader and a trader who manages a portfolio at a ratio of 5 % is highly risk-averse. “Margin-to-Equity is a just one measure of risk and not a complete view.” (Melin 2010, p. 209) String of losses sometimes push a trader to make rash decisions and trade off feelings rather than data. Rising Margin-to-Equity ratio is used as an identifier when a manger has strayed far from the agreed strategy. (Melin 2010, p. 209)

Margin-to-Equity ratio is a scarce topic in literature. Daniels Trading, an independent analysis company and an online broker, wrote a blog post about the margin-to-equity ratio in 2011. In the post they bring up a good point: “For example, one clearing firm we work with will offer clients 500 USD day margins on the E-mini S&P. This means that with as little as 500 USD a trader can purchase one E-mini S&P Future”. (Daniels Trading, 2011) Later they continue “That would give someone a contract value to account value ratio of over 115:1 (0,8%) which essentially means that for every 1 USD in your account (which was 500 USD), you are trading with 115 USD in borrowed funds”. (Daniels Trading, 2011) Daniels Trading mentions that most professionals tend to keep the ratio around 30% and recommends a figure below 50%. (Daniels Trading 2011)

4.6 Currency Exposure Hedging

Hedging a foreign currency exposure is a topic covered in a multitude of publications. Hedging is, at its core, risk mitigation and perhaps even risk elimination. Often hedging doesn't aim to eliminate risk, because risk is needed for any chance of a reward. (Graham, A., 2001, p. 13) The best extent of currency hedging is highly controversial. Portfolio risk is affected by currency exposure but it also affects the risk. (Schmittmann, JM 2010, p. 6) Pimco Insights made a story in the beginning of 2018 on the cumulative returns of hedged and unhedged bond investments. Figure 9 shows the two returns side-by-side. A clear distinction can be made from the volatility of the two data-sets in Figure 9.

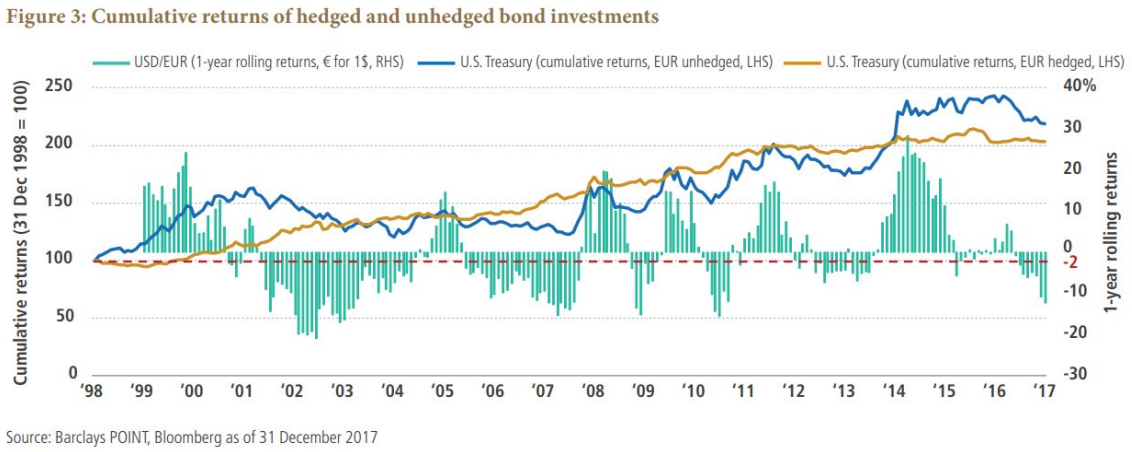

Figure 9: Cumulative returns of hedged and unhedged bond investments (Pimco Insights 2018)

According to Graham (2001, p. 117) futures contracts are not often used for hedging currency exposures. Several studies have been conducted on currency exposure hedging. Schmittmann (2010, p. 5-6) finds full hedging to be the best strategy in bond-based portfolios. Equities are more difficult to hedge as the inherent volatility in equities contributes to the overall risk much more than the currency exposure. (Schmittmann, JM 2010, p. 5) Hedging commodities' currency exposure is difficult due to the basis risk. Manager taking a position entirely to facilitate a need for a hedge is not ideal. "The basis risk is the risk that a hedge, such as a derivatives contract does not move with the direction or magnitude to offset the underlying exposure." (Horcher, KA 2005, p. 28-29) This section will explore two commonly used hedging strategies: direct hedging and cross hedging.

Direct hedging is hedging an exposure directly with an opposite position to the exposure itself. It assumes the exchange rates to be variables that can be hedged directly. For example, a direct currency hedge for 500 000 dollars sitting on a bank account could be to buy the EUR/USD futures contract to mitigate the fluctuation in the currency pair. Research conducted by Glen and Jorion (1993) suggests that currency-risk hedged international bond and fixed income portfolios strongly outperform portfolios with little-to-no hedging.

Cross hedging is hedging based on two highly positively or negatively correlated instruments. Its aim is to reduce the underlying risk of the investment portfolio by diversifying the portfolio to other products. (Investopedia 2018) Hedging strategies were asked in Current State Analysis from a portfolio manager, who explained the current state to be cross hedging. He explained that currently commodity volatility is hedged by diversification to less volatile commodities and to commodities with low correlation with the other positions in the portfolio, which in turn lowers the volatility further. On a portfolio level currency exposure is hedged with fixed income positions, mostly through ETCs and ETFs.

4.7 Pricing Strategy

According to Jensen (2013, p. 29) there are only three pricing strategies to position a new product. First strategy is penetration pricing, which is pricing a product lower than the competition. Penetration pricing is often used when costs of the product are substantially lower than the competition. Penetration pricing is disadvantageous to a company if the product is superior to the competition, which leads to less margin per product sold. (Jensen M., 2013 p. 32-33) Second strategy is setting the price higher than the competition, also called skimming pricing. As the name states, this strategy skims the market for the fat. Jensen (2013, p. 37) reveals skimming pricing to be an excellent and highly profitable strategy, as long as there isn't a competition already positioned as premium.

Lastly competitive pricing is where a company sets the price at the same region in relation to the competition. As long as the costs related to the product are similar to your competitor's products, this is the easiest strategy to implement – in Jensen's words (2013, p. 38): "You just pick a price similar to competitor's and run with it." Traditional pricing strategies account for several variables affecting the price of a product. Peter Hill (2013, p. 54-57) suggests that pricing set on experience and judgement is funda-

mentally flawed. He adds “Personal experiences and individual characteristics, such as confidence, overshadow the importance of research and facts.”

Asset management is at its core the business of managing money in exchange for fee. At the time of purchase an investor buys shares of a fund at the Net Asset Value and receives shares in proportion to the amount of money used to purchase the fund minus a possible subscription fee and/or any other front-end fees. At the time of redemption, the equation is similar, the investor sells the shares at Net Asset Value and receives money in proportion to the number of shares minus any back-end fees. (Loader, D., 2006 p. 85)

4.8 Conceptual Framework

Chapter 4 compiled the existing knowledge on issues that came up in the Current State Analysis. Before seasonality could be researched, first futures contracts needed to be explained. Futures contracts are not an easy topic, but the scope of this thesis is not futures contracts per-se, but instead they are tools that can be used to invest in commodities.

Both Stalcup (Stalcup, L. 2012) and Cordier & Gross (Cordier, J. & Gross, M. 2015) emphasized the fact that seasonal commodities shouldn’t be taken as trade signals, but instead as guides on the likely direction of the security. Seasonality patterns were mentioned in quite a few books. Ruggiero’s (stated that the fundamentals behind seasonal moves are due to fear of crop damage. (Ruggiero, Murray A., Jr 2002) This notion was mentioned again in Milonas’ book when he explained the crops to follow a seasonal pattern due to harvest-fear and harvest-relief.

Margin-to-Equity ratio was asked in the Current State Analysis interview from a portfolio manager, where he mentioned the ratio to be around 25 % - 30 %. It was also revealed in the competition analysis from Estlander & Partners funds to be between 20 % - 30 %. Literature review revealed that a risk-averse investor is likely to have the ratio somewhere near 5 % while a high-risk trader would keep it at 70 %. (Melin 2010, p. 209) Daniels Trading mentioned that the professionals tend to keep the figure around 30 % while maintaining it below 50 %. (Daniels Trading 2011) When comparing these figure to the figures found out through the current state analysis, the researcher finds the two data-sets comparable. The two data-sets overlap at 30 % - 35 % which means its relatively safe to say the ideal figure to be 30 % +- 5 %.

Unhedged investments are prone to currency fluctuations and thus generate more volatility. The literature reviewed in chapter 4.6 reveal the issue to be severe. The consensus is that hedging is difficult due to other risks, but it is required. This study finds hedging to be extremely important to mitigate the high volatility inherent for commodities. Several studies and journals validate this inductive reasoning: Graham (2001), Schmittmann (2011), Horcher (2005) and Glen and Jorion (2013) just to mention a few.

There are a few pricing strategies available for a mutual fund. Competition examination unveils that the performance fees have nearly vanished over the years from commodity funds. Penetration pricing is seemingly out of the question as Handelsbanken Commodity is at a very low price point. Competitive pricing strategy seems to be the chosen strategy for the rest of existing domestic competition. Jensen (2013, p. 37) made clear that skimming pricing strategy is excellent and highly profitable strategy, as long as there isn't a competition already positioned as premium.

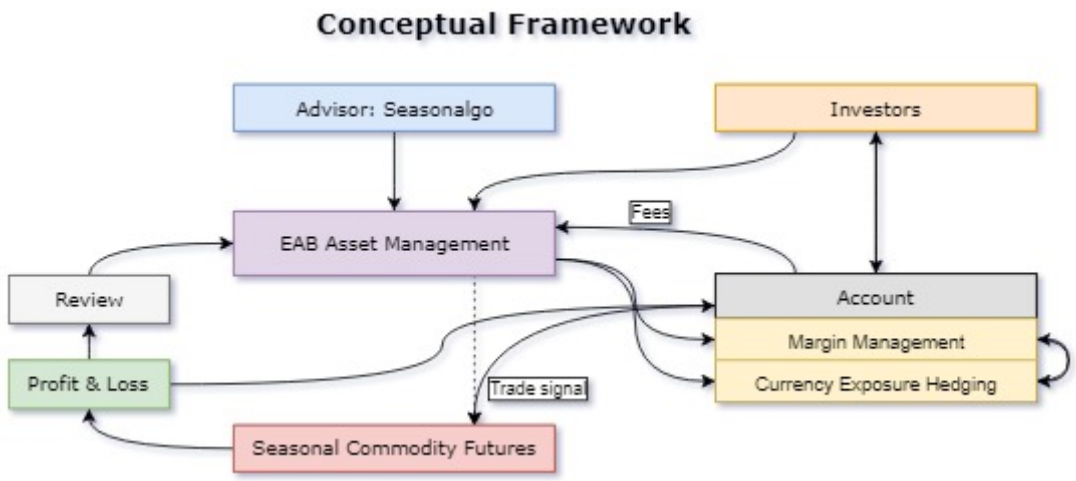

Figure 10: Conceptual Framework

Conceptual framework is visualized in Figure 10. It all begins with the investor wiring capital to the account and at the same time EAB Asset Management is informed of new funds coming to the fund and any potential fees are charged. Within the account EAB Asset Management manages the margin requirements and hedges the currency exposure. Meanwhile EAB Asset Management consults companies such as Seasonalgo for potential seasonal commodities to invest in. Once a trade signal is given by the company, the money from the account moves into a Seasonal Commodity Future. From

there the position either makes a profit or a loss. From this additional information is gathered and reviewed to help future decision making. The portfolio manager will exit the trade and the funds are deposited or deducted from the margin on the account.

In conclusion the researcher would like to point out the lack of academic research on the seasonality of commodities. A proposal for research could be to examine the mathematical basis for the seasonality and the fundamental reasoning behind the phenomenon. Also, the researcher was surprised to find that there are few-to-no studies conducted on the pricing strategies of asset management companies. General pricing strategy concepts are readily available in multiple publications, but a book specifically optimizing an asset manager's costs and margins. The idea of considering mutual funds as products and private banks as companies trying to make their own return on assets or investments is foreign to many. There is definitely research to be done in this area.

5 Building the Proposal

Before the proposal can be built certain issues must be explored. Firstly, the viability of the strategy must be explored. Without the seasonality of commodities, there is no strategy and without the strategy there can't be a green light for the proposal. Strategy viability is one of the most important aspects of this thesis and a considerable amount of research, back testing and validation will be conducted on the strategy in chapter 5.1.

There are several types of funds such as UCITs and SICAV to mention a few. This study will also explore the legal viability of the strategy and determine the type of mutual fund. In addition, the strategy might include taking short positions and the limitations with short positions and regulation. Later in chapter 5 the researcher will give a brief overview on the pricing and commercial viability to explore the need for such a commodity fund. Finally, chapter 5 will end in a proposal.

5.1 Strategy Viability

In this chapter the researcher will create a strategy simulation based on daily price data from Seasonalgo, Quandl, Bloomberg and Morningstar. The data was selected to be Settle -data rather than any other data point from during the day as Settle -data was the only data available on certain products. Period for the strategy back testing was chosen to be the past 10 years as it was the longest amount of time some products had historical data available. Historical data received from previously mentioned sources was worked on in Microsoft Excel, because the researcher is most familiar with that software and it suits the needs of this thesis very well.

Strategy was based on the best seasonal commodity trades in terms of risk-reward. Trade signals have been picked from Seasonalgo's recommendation algorithm (Seasonalgo 2018). Ruggiero (Ruggiero Murray A., Jr 2002) stated that T-Bonds could also possess seasonality but for this study the researcher wishes to include solely commodities. Trade signals were picked from a total of 16 different commodity markets to facilitate hedging. Hedging is also accounted for in position sizing. Outright positions are taken with less exposure, while hedged positions such as spreads and butterfly-spreads are taken with a larger position. The profit figures within this chapter include the transaction fees incurred, but don't include a management fee.

Figure 11: Strategy Allocation

Figure 11 illustrates the strategy's positions taken in various markets. Soybeans and its' derivatives have a major share with 42 %, while Corn and Coffee come second and third at 18% and 16% respectively. In relation to the GSCI the strategy is very different. S&P GSCI contains a whopping 58 % in Energies alone and when you add in Metals the total reaches 74 %. (ETFstrategy 2017) The strategy used in this study has none of that 74 %. Figure 9 doesn't consider the direction of any position (long or short), but instead highlights the markets in which the strategy is involved in. Short positions comprise a total of 29 % of the strategy while majority of the positions are long positions with a yearly average of 71 %. This allocation was selected for this thesis to maximize profit over a one-year period and to spread the trading to happen throughout the year. In addition, the strategy was formulated in such a way that a trade would take place roughly once a week simply because if a fund does nothing for weeks, it's hard to justify taking money from clients. Because of these limitations the best opportunities fell on the commodities represented in Figure 11.

The strategy takes a look at the margin-to-equity requirements necessary for the operation of the potential fund. Margin-to-equity requirements vary over time and as the capital allocated grows. It is near-impossible to calculate the margin-to-equity required at any given time due to the gains and losses of previous weeks, months and years.

For the purpose of this study it is important to measure it in some way. The researcher thought it would be best to illustrate it as a graph over time. The year 2017 was selected as an example. It doesn't matter what year would be selected as the graph would look almost identical from year-to-year, with the exception of previously mentioned profits and losses that are hard to account for.

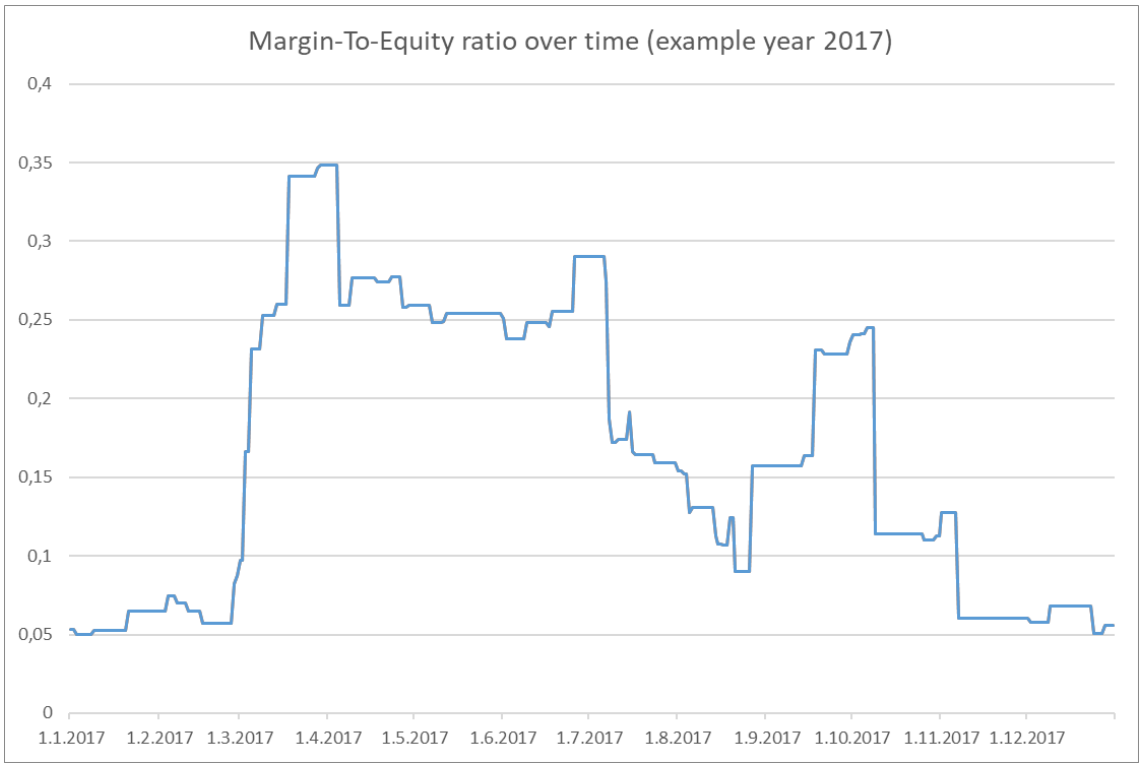

Figure 12: Simulation Margin-To-Equity ratio

Figure 12 visualizes the potential problems with margin-to-equity in a futures trading dedicated strategy. The margin requirements vary over time greatly as most of the potential seasonal trades are initiated between beginning of March and July, while some take place between October and November. The winter months are not ideal for seasonal commodity trades. Some commodities are traded over year-end, but positions are small due to the high volatility of the commodities in question. Margin-to-Equity aside, daring problems arise when taking a look at the strategy performance as an euro-based investor.

Euro-based investors have a currency risk when holding large amounts of foreign currency on an account. Trading commodities in an US-based exchange requires a large amount of margin to be held on an account. Figure 13 reflects on the issue of currency exposure hedging explained in chapter 4.6. Figure 13 is the last 10 years of strategy simulation. Blue line is the strategy simulation as an euro-based investor with

no currency hedging. Black line illustrates the simulation for an us-based investor, or with a perfect hedge. Yellow line is the S&P GSCI to benchmark the two against. Volatility reaches a massive 11,14 % when there is no currency hedging, but with a perfect hedge volatility drops to a meager 4,40 % over the past 10 years. The period between 27.7.2008 and 27.7.2018 sees the Sharpe ratio at 0,825 for the unhedged and 2,734 for the fully hedged strategy. Both of which are relatively good.

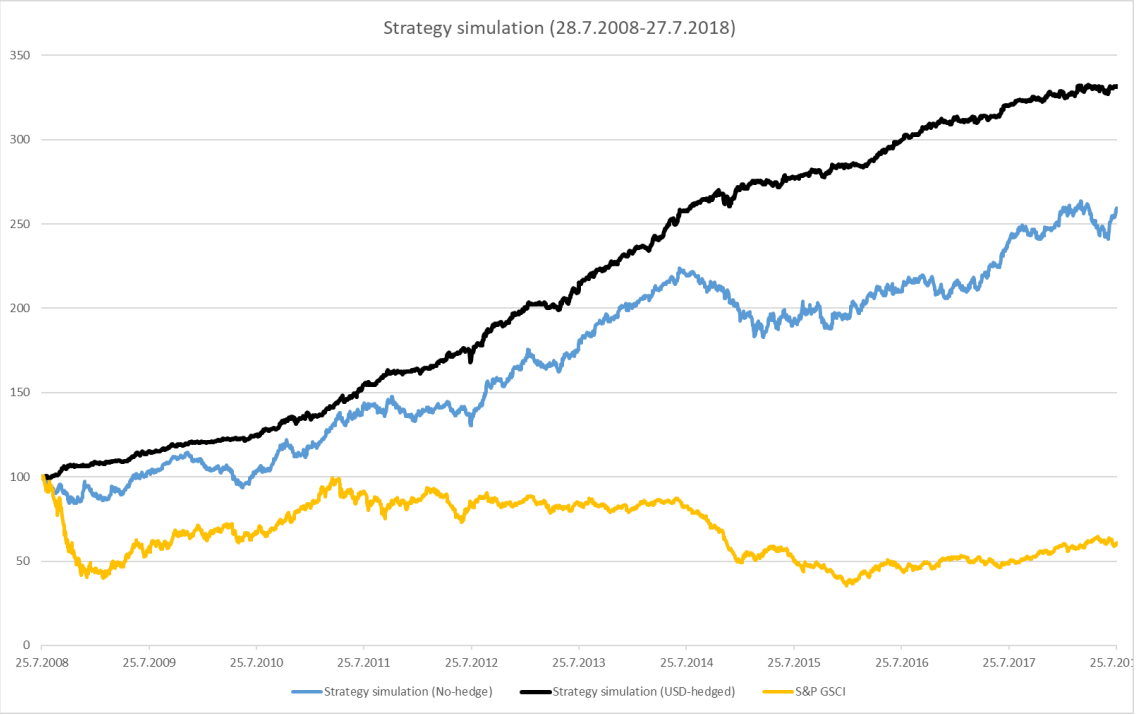

Figure 13: Strategy simulation (27.7.2007 - 27.7.2018)

Profit rates of the strategy are excellent as seen from Figure 13. Fully hedged, the strategy achieves an amazing 231,55 % on average with the previously mentioned 4,40 % volatility over the 10-year period. Euro-based investors with no hedging achieve only 157,54 % in 10 years. Last few years are less impressive with last 5 years reaching 42,62 % and 54,48 % in profit for hedged and unhedged respectively. Hedging in figure 13 is calculated as a “perfect hedge” with no USD currency exposure, which is good enough for illustrative purposes, but in reality the fund might have had a worse hedge due to fluctuations in price, market volatility and other factors. Thus volatility calculated for the fully hedged strategy would likely be higher than the calculated value.

The researcher selected a few commonly used benchmark indices to benchmark against the strategy’s performance. These indices include the S&P 500 to represent the US stock market, MSCI All-Country World Total Return Index to represent the world

stock market, Bloomberg Euro Aggregate index to represent the fixed income markets and S&P Goldman Sachs Commodity Index (GSCI) to represent the price development of a broad commodity basket.

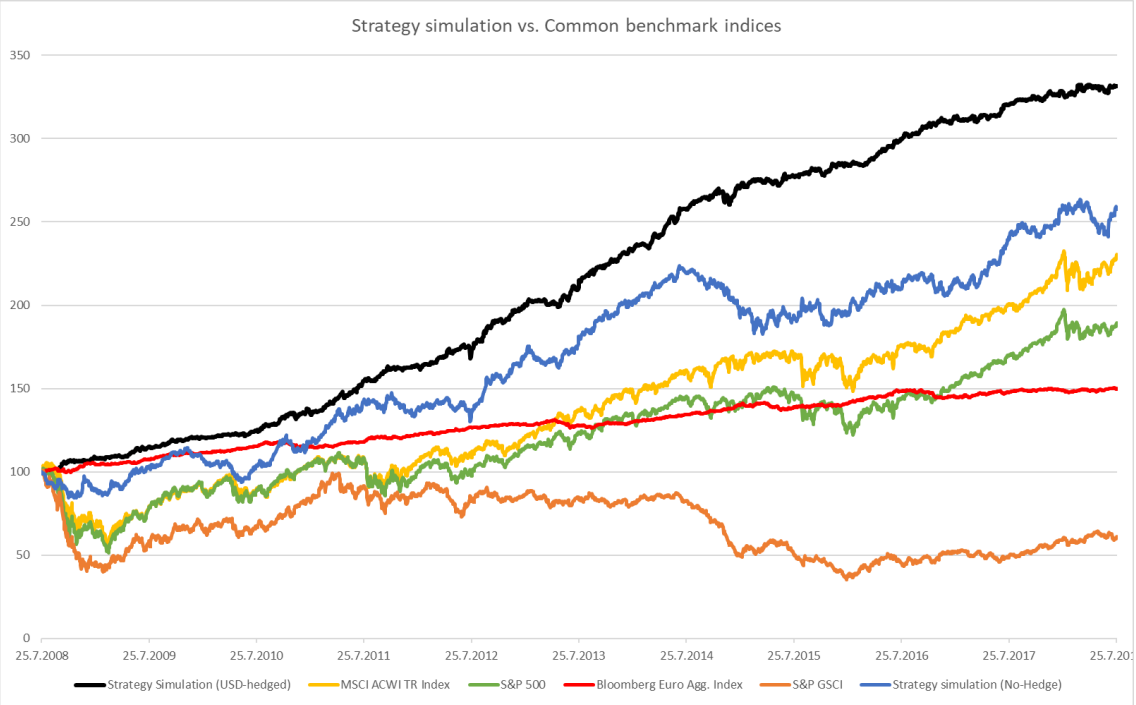

Figure 14: Strategy simulation vs. Common benchmark indices

Figure 14 reveals the performance of the strategy against the selected benchmarks. Strategy simulation fares well against the benchmarks. Second best performer is MSCI ACWI TR with S&P 500 close behind. If the Goldman Sachs Commodity Index were to be chosen as the benchmark index, it is quite clear from the chart that the strategy would beat its benchmark year after year. The researcher calculated correlation coefficients with the above mentioned indices over the 10-year period. Correlation between the hedged strategy and all of the indices was shockingly low between -0,001 and -0,035. It means that the strategy doesn't follow any of the indices. The unhedged version of the strategy showed slightly higher correlation between USD based investments, such as the S&P 500 and S&P GSCI, at 0,179 and 0,205 respectively. This is expected as the correlation between the unhedged strategy and EUR/USD rate is comfortably at 0,851. In fact, the unhedged USD exposure of the unhedged strategy correlates more with USD, and less with the indices.

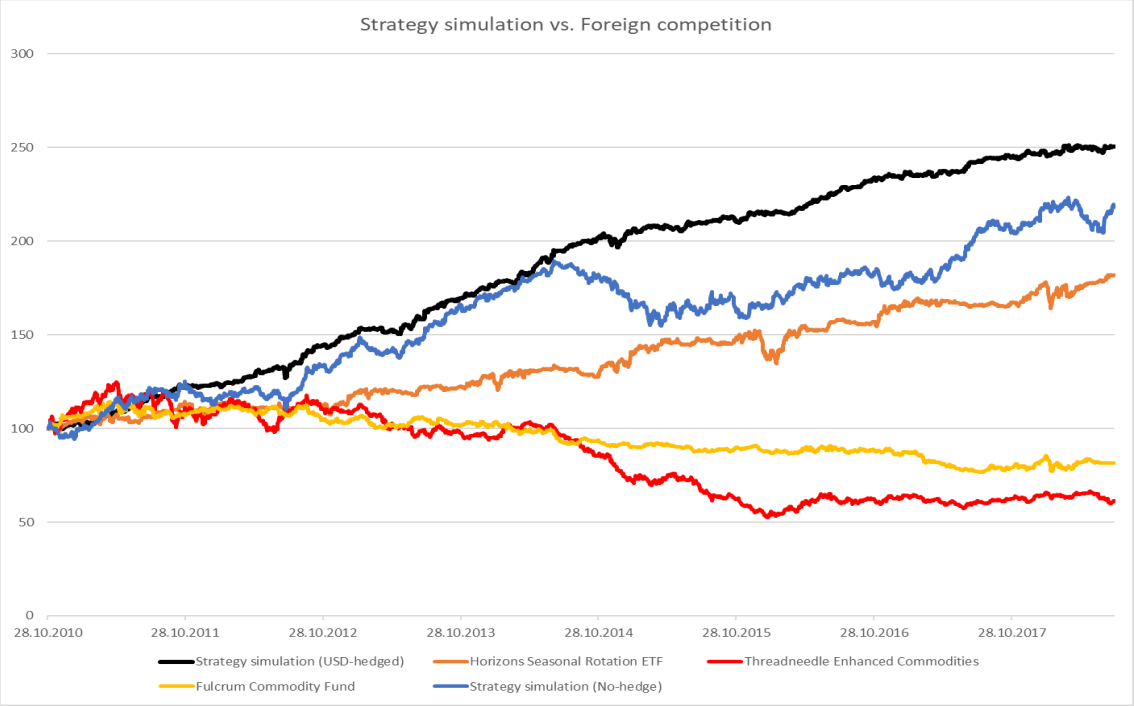

Figure 15: Strategy simulation vs. Foreign competition

Foreign competition is a relatively large issue. On the other hand, there are dozens of substitute products, but on the other hand there are only a few real competitors. The best competitors, in terms of strategy similarity, from chapter 3.1.3 were selected for comparison in Figure 15. Horizons Seasonal Rotation ETF was chosen due to the seasonality factor of the ETF, even though it is mostly comprised of stocks. Threadneedle Enhanced Commodities and Fulcrum Commodity fund are good comparisons in terms of strategy. Threadneedle is one of the few commodity funds that don't try to mimic an index, but has an insurmountable long-only drawback, which pushes the value of the fund down. Fulcrum Commodity has fared slightly better with its systematic approach to commodities. Overall the selected competition has fared worse than both the hedged and unhedged versions of the strategy.

Most of the domestic competition only have a short history of data. Figure 16 illustrates the longest possible data available from OP-Raaka-Aine, Aktia Commodity, Handelsbanken Commodity and Estlander & Partners Resources. In Figure 16, the strategy has not fared as well as some of the competition. Handelsbanken Commodity rides on the good performance of oil in the past 1½ years as it contains nearly 40 % of Oil and its derivative products. It leads the charge at a profit close to 25 %. Unhedged simulation shines second at around 5 % and the hedged strategy is around 3 %. It must be remembered that the competition for both Figure 15 and Figure 16 also include any

possible management fees. The graph doesn't include a management fee for the simulated strategies. Even with a management fee of 2 %, the unhedged strategy would outperform most of the competition.

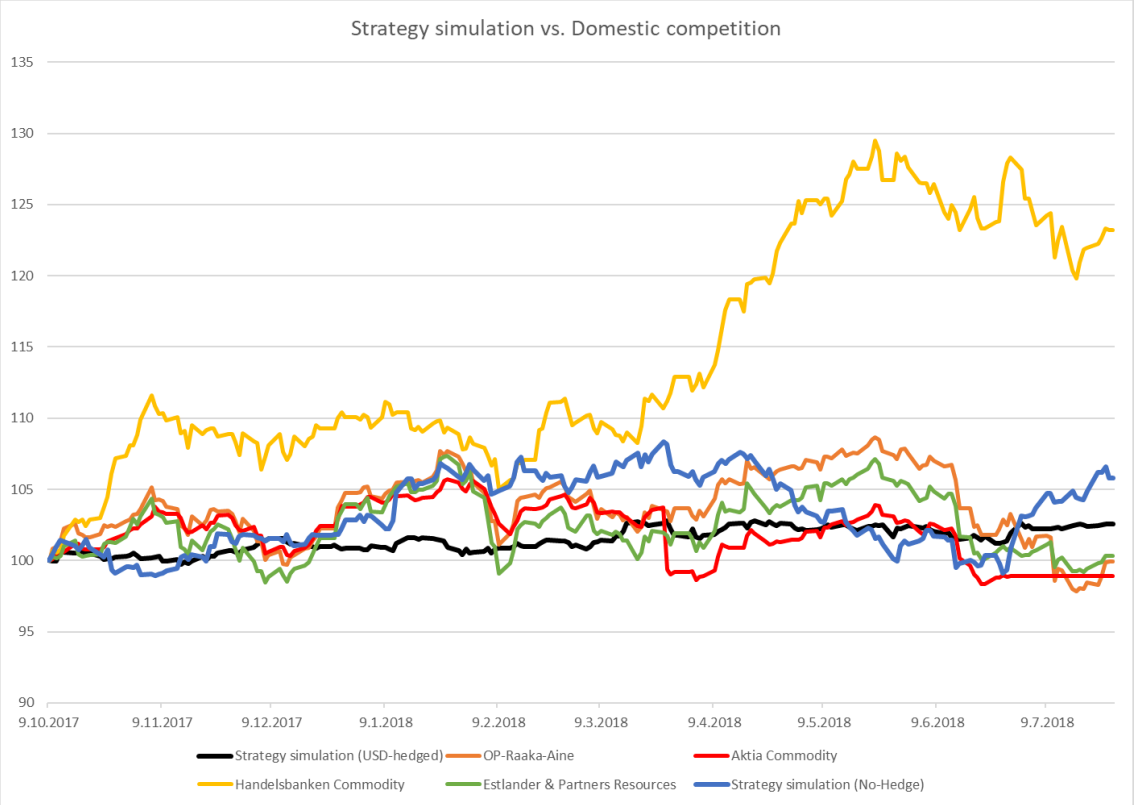

Figure 16: Strategy simulation vs. Domestic competition

5.2 Legal Viability

For this chapter the researcher sent a questionnaire the head of the legal department via e-mail to determine the potential difficulties and hurdles in creating a mutual fund around seasonal commodities. Data was mostly links to legal documentation and thus it is not included in this thesis, but instead references will be made directly to the legal documentation. Questionnaire questions were simple, few in number and aimed to answer a question: Is there any regulation that would prevent such a mutual fund from being created? Two issues were examined more thoroughly: Firstly, Does the short sale regulation affect the strategy simulation? Secondly, does the regulation on mutual funds rules affect the potential creation of the fund?

Finnish Mutual Funds Act states the requirements to create a mutual fund. The minimum capital invested has to be at least 2 million euros and a mutual fund must have at

least 50 investors. If the fund doesn't have 50 investors, but instead 10, each of them have to hold shares worth at least 500 000 €. If the fund doesn't have 10 investors, a mutual fund can be created for a single investor, if the capital invested by that investor is at least 2 million euros. A special fund (Erikoissijoitusrahasto) can have less than 10 investors, as long as the total capital invested is at least 2 million euros. (Sijoitusrahastolaki 48/1999. 27 luku)

European Securities and Markets Authority (ESMA 2012) published a policy that came into effect in 2012 determining the rules and regulations surrounding short sale of assets. Based on their policy, the regulation only affects shares, sovereign debt and credit default swap markets. Secondly the Finnish Mutual Funds Act (Sijoitusrahastolaki 48/1999. 11 luku) indicates that there is no conflict with the strategy, as long as the fund doesn't invest in shares. If the researcher has made a mistake reading the Mutual Funds Act, there is a mutual fund form called Erikoissijoitusrahasto, which can basically invest in anything. There is no regulation that would prevent the creation of a mutual fund. The strategy is legally viable either as a regular mutual fund or as Erikoissijoitusrahasto.

5.3 Pricing and Commercial Viability

For this section the researcher interviewed the of head of global products find out if the pricing strategies discovered through current state analysis and existing knowledge are in line with the company policies. This section also aims to answer the questions: Firstly, Is there a need for this kind of product within our current client- and prospect-base? Secondly, is it financially viable to create the fund within the pricing parameters set by competitor analysis and literature review? Both questions were asked from the Head of global products along with a few others, data was collected with field notes and later transcribed into Appendix 3 found at the end of this document.

In chapter 3.4 the researcher summarized the key findings of the Current State Analysis. Research revealed the majority of subscription fees to be at 1 %, while redemption fees were disappearing from existing competition. The second question in the interview with the head of global products revealed that majority of the institutional clients might pay 0,5 – 1,0 % from an alternative investment fund such as this. Institutional pricing hasn't been in the scope of this Thesis, but in general institutional prices are around 50-70% less what retail clients pay for the same product. First interview question tackled the need for such a product and the head of global products responded that the

strategy might fit some institutional clients in their core & satellites strategy. Especially because it has little-to-no correlation with most of the clients' portfolios.

Second question was regarding her evaluation of the strategy, whether its financially viable to create a mutual fund with the pricing parameters set by competitor analysis and literature review. She responded swiftly that from a financial point of view this can be done without hiring new people. Fund management department might get a bit of extra work, but it's doubtful that they would need more personnel. "It's always better if there is no need to recruit people" she added.

5.4 Building the Proposal

The profitability of the strategy alone warrants a proposal to create a mutual fund around the phenomenon of seasonality. Both unhedged and hedged positions show great potential. Literature review into currency exposure hedging revealed hedging to be difficult and perfect hedges to be even harder to find. It is highly likely that the profit, Sharpe and volatility for the strategy would actually be somewhere between the hedged and unhedged values.

Margin-to-Equity ratios were already covered when building the strategy, which kept the ratio lower than the suggested 30 % most of the time and the ratio peaked at 35 % only when there were multiple contracts at the same time. Currency exposure hedging should be done as much as is possible, unless a view on the EUR/USD is made, which could provide additional profit in addition to what the strategy makes. Strategy is definitely viable and the proposal is to implement the strategy as-is into a newly created mutual fund.

Pricing of the mutual fund should correlate with the literature review. There isn't a premium product on the market and skimming pricing is ideal for this mutual fund. Prices should be set somewhat higher than the competition, but also provide cheaper options for institutional investors. Based on the historical performance of the strategy suggested in this thesis, the profits are much higher than competitors', which also supports the idea of skimming pricing. OP-Raaka-Aine is the pricing leader at 1,87 % per annum, the research suggests that the pricing for consumers for this fund should be at around 2 % - 2,5 %.

The proposed strategy should follow the conceptual framework set in the chapter “Conceptual Framework”. The research shows no legal, pricing or commercial obstacles that would prevent a creation of a mutual fund. Benchmark index should be selected to represent the commodity allocation of the strategy. Only benchmark index even close to what is required is S&P GSCI Light Energy one used by Danske Invest Commodity and Aktia Commodity. However, the strategy has a larger tilt to agricultural products and a different benchmark index should be investigated.

From a legal and financial point of view nothing is standing in the way of going forward with the plan set out in this thesis.

6 Summary, Validity and Reliability

6.1 Summary

This thesis began with three research questions: What commodity funds use Seasonalities as a basis for decisions? When a price of a security rises in 14 out of the past 15 years between October and December, why don't we create a mutual fund around this phenomenon? Is it possible to create a mutual fund around the seasonality of commodities and make it beneficial for all parties involved?

Current state analysis included a thorough competitor analysis to determine how the competition does it's investing and also to determine what went wrong with the discontinued funds. Most importantly current state analysis aimed to answer the first question mentioned above. The research found that no fund advertises seasonality as the basis of decision making or notably not any the researcher could find.

Literature review analyzed the concepts found in current state analysis. Concepts such as Futures contracts, seasonality of commodities, Margin-to-Equity, Currency exposure hedging and pricing strategies were explored to find the best practices to important issues for this thesis. The analysis was used to provide a conceptual framework to base the proposal on.

To create a proposal, the researcher had to first check whether the strategy itself is viable at all. The viability of the strategy was determined through quantitative study into the history of seasonal commodities with the help of Seasonalgo and Bloomberg. This section of the thesis aimed to answer the second question mentioned above. Why wouldn't a fund be created could be tripped by the inadequacy of the strategy. However, the strategy simulation proved to be even exceed the expectations of the researcher, thus the question was answered.

Pricing, Commercial and Legal viability were also checked through interviews and questionnaires. This section of the thesis aimed to answer the third question mentioned above. Whether there is anything stopping the creation of such a fund. The research found that this strategy fits in the mold made by regulation, pricing and competition. It even is financially viable, as long as there are enough shareholders and capital invested. In the end a proposal was devised to create a mutual fund based on seasonal commodities.

Upon presenting this thesis to my supervisors the researcher was met with excitement and questions. Strategy seemed viable to all, but questions arose from the use of margin-to-equity and pricing strategies. It is common practice in the world of finance to price the products in a tiered manner and this was one concern the researcher didn't explore in this thesis. The notion from the board of directors was that this, if ever to become a product, should be priced in a tiered manner. Tiered pricing means that clients with less money should pay a premium as opposed to the clients who have a larger portfolio. Second important point brought up after presenting this work was margin-to-equity. Firstly it may have been a new term to some and not understood perfectly after reading this thesis. Secondly it is strange that the fund manages to create a decent profit even though the margin-to-equity ratio is nowhere near the optimal position for a quarter of the year. To impress the audience even more, the strategy should have an idea of where to invest during those months. It may very well be that for this to be a viable fund equities of fixed income products should be explored and managed during those slow four months from the beginning of November to the end of February.

All-in-all this thesis concludes with the notion that seasonality can indeed be used for optimizing a commodity fund's performance and it may be viable to create an alternative investment fund based on this topic.

6.2 Validity and Reliability

University of South Florida has published the basic concepts for validity and reliability. They simplify the problem as follows: "Let's imagine a bathroom scale that consistently tells you that you weigh 130 pounds. The reliability (consistency) of this scale is very good, but it is not accurate (valid) because you actually weigh 145 pounds." If a study is valid, it means that the study measures what it's should to measure. Furthermore, if a study is reliable, it must provide the same result every time. (University of South Florida ND)

Validation is one of the most important aspects of a scientific study. Without validation a study would not be scientific. There is a plethora of validation techniques available. This study is valid through the triangulation of different research methods pointing at the same direction. According to Carter Nancy et al. (Carter et al., 2014) Triangulation can be used to test validity through the convergence of information from different sources. For example: Current State Analysis revealed a certain cost structure of mu-

tual funds, which was backed up by literature review. The same is true for Margin-to-Equity analysis. Currency exposure hedging was touched on in the literature review, but its importance was only confirmed by strategy simulation.

Quantitative data is entirely reproducible by accessing Seasonalgo's website and any data source for historical commodity future data. Figures received from said sources are consistent with several data refreshes, which means the data is reliable. Data was collected through a 10-year period which, according to Twycross and Shields (Twycross A, Shields L. 2005) is long enough to be a basis for credibility and validity.

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8 Appendices

APPENDIX 1: Current State Analysis – Interview with Senior Investment Officer and Supervisor at EAB Group Plc.

- **With a few sentences, describe your position in the organization. What do you do?**

I'm the Chief Investment Officer, my responsibility is to lead the entire portfolio management team to a chosen direction, while acting as a leader and not a manager. I don't need to know every single detail. I'm required to provide the best possible tools for the portfolio team to excel.
My job is to transform the intent of the board and our CEO into practical actions. I also manager our product portfolio in relation to competition while taking into account our resources, customer base and potential customer base.

- **How have commodity investments developed during your career?**

In the beginning of my career they weren't talked about much. They were quite rare. In the beginning only a few investors understood what it really means to hold a position in commodities (costs).
You had an idea, but could the used product capture the idea.
Mid 90s diversification benefits were in emerging markets but in 2000s in commodities.
Mid 2000s, they were talked about when discussing additional return and risk diversification. Many got correlation advantages and diversification benefits.
After the financial crisis in 2009, maybe a few traders from the equity side changed to the commodity side. The trading patterns of the commodities changed and the correlations rose.
Then the peak oil and rise of China etc. -> Commodity index came down and we saw a couple of bad years for commodities.
2015 we started to look at commodities again and created a fund that diversifies in commodities. The performance of commodities in recent years, despite a few exceptions, has not promoted the diversification into commodities.

- **How has Elite Asset Management / FIM managed commodity investments in the past?**

In FIM, commodities weren't used too much. When they were, they were executed through Emerging Markets due to the correlation between the two markets.
2015 we started to look at commodities again and created a fund that diversifies in commodities. The performance of commodities in recent years, despite a few exceptions, has not promoted the diversification into commodities. We tried to get excess return with index or ETF -investments.
In EUFEX we had a commodity product. In Elite we have a single product where it is used as a source of return and risk diversification. We also have a product where gold has been used as risk diversification (hedge) in the past but not anymore.
We have managed them as a whole – implementing the buy-and-hold strategy. Mostly we haven't done individual commodity investments with gold being the exception.

- **What good (or bad) experiences do you have from commodities?**

BAD! Baaaad!

- Divergence of Oil and Natural Gas.
- Peak Oil -> Bioethanol Boom -> Transformation of agriculture in the Black Earth -region (Ukraine, Russia).

Can't say that I have much good to say about them.

- **What is our selection criteria of commodity futures?**

You should ask one of our Portfolio Managers about this. I don't even need to know or want to know. If I would – I would be a micro-manager and I don't want to do that. We have a company policy for opening new lines for new products or service providers.

APPENDIX 2: Current State Analysis – Interview with a Portfolio Manager, EAB Group Plc.

- **With a few sentences, describe your position in the organization. What do you do?**

I'm a Portfolio Manager. I take part in managing our different equity strategies (systematic and traditional). I'm also partly responsible for our Multi-asset strategies that invest in stocks, fixed income, alternatives and commodities). Third party fund selection process is also part my responsibilities.

- **What is your background in commodity trading?**

I have done commodity trading only in Elite. My background is in fund selection, specializing in long only and alternative funds and strategies. In Alternative investments I look at mainly hedge funds. When analyzing hedge funds and long only funds I have come across commodity strategies. Mostly CTAs use commodities nowadays.

- **Basis of decisions: What is our selection criteria of commodity futures? Technical- or Fundamental Analysis?**

I would say that it's a combination of quantitative analysis and basic fundamentals. In a way the most lucrative commodities are found by quantitative analysis and then fundamental analysis is used on the results to determine the final selection of commodities. Then I generally enter the contract with the most liquidity.
Fundamental analysis in commodities is commodity news and other news feeds from Bloomberg. I keep a keen eye on Bloomberg and the data feed it provides. I regularly check other sources such as the United States Department of Agriculture. In addition, I use commentaries from two separate asset managers to help with the decision making process.

- **When do you time your entries / exits from trades?**

I somewhat look at the chart from a technical point of view and then look at the fundamentals which I explained in the previous questions. Based on the quantitative model my data updates a ranking within commodities and that's where my entries and exits come from.

- **How do you Hedge the commodity positions for forex fluctuations or commodity volatility?**

I don't typically take a short position in commodities. I push down the commodity volatility in the portfolio by diversification into less volatile commodities. Commodity correlation within the portfolio also plays a role. If the correlation is low, it in turn lowers the volatility of the portfolio. I would need to have a high conviction to take a short position, just like in a long trade. At the portfolio level forex exposure is taken with fixed income positions and it's hedged mostly through ETCs and ETFs.

- **What are the margin limits used per contract? How much excess cash in trading account after the margin limit is met?**

I can't say for sure, because the portfolio I manage has so many different commodities and futures. I think about collateral as a whole. Remember that I trade several different futures and contracts, so the amount of collateral is dependent on what futures are in the portfolio. If an initial margin is 3500 dollars, I would imagine there should be somewhere between 10000 and 13500 dollars as margin per contract. For futures I hold a necessary amount of capital as excess margin. In addition to that the portfolio has other liquid products. In general, when a portfolio manager thinks about the excess margin required he must think about the counterparty risk and the opportunity cost incurred. When thinking about alternative short term positions, I can't take positions in active funds as the money will take several days to come to the account if I need it for collateral, but instead I prefer to use ETCs and ETFs because I can get the cash within a day. The liquidity of the fund has to be considered as a whole.

- **Who do we partner with to trade futures? What are the fees of trading futures with our partner? What are the fees for holding large sums of cash in a trading account? Can the excess cash be held in any instruments apart from cash?**

No comment on the question on our partner. No comment on fees, other than that they are cheap. Futures trading is by nature very cost efficient.

- **Do you have contract limits per commodity? (f.x. max 5 contracts of soybean meal)**

This has to be divided into parts as the fund has the maximum exposure written in the rules. Firstly, I check the entire commodity exposure on a portfolio level. Secondly, how

much of a single commodity? It depends on the liquidity of the contract, our view on the particular commodity, how much we want to allocate to commodities and other factors. I check previous contracts for clues when the liquidity starts to dry up. 3% - 4% is my absolute maximum weight per commodity and 1% is the minimum. As in any investing, portfolio diversification is key. In a commodity portfolio it's important to think how much risk is in the other parts of the portfolio (stocks & interest rates) – In which asset class do you want to take risk?

- **Do you use arbitrage strategies?**

I don't typically do arbitrage strategies, because it takes a lot of time and arbitrage is most effective when day trading, which we don't do. I can't be spending 90% of my day trading and making a dollar here and a dollar there.

- **How is Seasonality taken into account when choosing the time and instrument – When and where to invest?**

Not in the quantitative model at the moment as criteria. Mostly the seasonality comes from fundamental analysis to support the decision. Last summer we studied quite a few academic journals on commodities and found out that there are a lot of factors that affect the price of a commodity in addition to seasonality. So we don't actively use seasonality as a driver to base our decisions on, but we try not to trade against seasonal patterns.

APPENDIX 3: Pricing and Commercial viability – Interview with Head of Global Products, EAB Group Plc.

- **After briefly reviewing this work-in-progress thesis, Is there a need for this kind of product within our current client- and prospect-base?**

Commodities haven't come up directly in discussions with clients, but I know some clients have done investments with Zenito Silver & Gold. There might be interest for a product that has zero-to-no correlation with the current portfolio. Some clients build their portfolio with a core & satellites model. Core means in investment terms a part of the portfolio that is allocated to a specific asset class via index investments. Those cores have satellites, which are related by their asset class to the core but they are specific types of strategies that take advantage of different market behavior.

- **How would you evaluate this strategy? Is it financially viable to create a fund within the pricing parameters set by the competitor analysis and literature review?**

From a financial point of view its always better if there is no need to recruit people to run this strategy. It's doubtful that our fund management department would need more people to do the extra work that would come with the creation of this fund. Headcount wouldn't need to increase in portfolio management either, which means fixed costs would stay the same, as long as someone could manage this strategy along with other duties. Of course there is an opportunity cost, that person couldn't spend that time to do other things.

There are no known "seed investors" who would invest in a strategy like this, but that doesn't mean that there is no interest. I work mostly with institutional investors, for them this strategy would be doable at 0,5 % - 1,0 % management fee. As long as there is enough capital invested, it is financially viable.