INVESTMENT PHILOSOPHY & STRATEGY

Investment Philosophy

STIR uses a focussed investment approach which seeks to extract alpha from the short end of the G10 yield curve. STIR regards the 0-3yr sector of the fixed income curve as an asset class exhibiting unique alpha characteristics. The inputs to this source of alpha include, the discretionary process that is Central Bank policy making; domestic versus global policy friction, credit concerns, seasonal credit demands, domestic currency concerns and the inability of anyone to successfully model the reaction function of the Central banks, to name but a few. STIR believes the primary source of Alpha derives from the observation that the majority of the end users of interest rate risk are non-professional. (98% of the institutional and individual population of the G10 have interest rate exposure, less than 1% of this total would claim that the monitoring and management of interest rate risk was their primary focus: in short the prevalence of participants in the short end of the market whose motivation is not strictly profit, makes the trading of this area of the curve a “zero plus game”.)

The fund is not intending to take foreign currency risk unless it represents a hedge against a correlated interest rate exposure. The fund will not take credit risk outside of governments and government agencies.

Investment Strategy

The fund seeks to maximise total return on a risk-adjusted basis by exploiting the absolute and relative value opportunities in the short-term interest rate markets of the G10. The investment process of the fund is driven by a discretionary assessment of fundamental economic data and technical analysis of the term structure of interest rates. The fund employs proprietary trading strategies using instruments whose value may be affected by G10 central bank policy and whose maturity is less than five years.

The fund aims to exploit three specific aspects of the structure of short-term interest rates to maximise returns.

1. Expected Future Policy Action (EFPA). This strategy focuses on the information content of monetary policy decisions and the broader economic implications that might affect the yield curve between 3 months and 3 years. Specifically, it focuses on how policy action or inaction impact expected future policy action.

2. Announcement and Non-announcement trades (ANA). The central banks of the G10 work on a policy announcement timetable as a route to increasing monetary policy transparency. Since the policy announcements that follow these meetings usually have a binary effect on LIBOR rates, there are occasions when attractive risk-reward trades can be constructed with a very short-term time horizon. This section of the portfolio also seeks to exploit elements of the Samuelson Hypothesis.

3. Risk Arbitrage (Relative Value, RV). The huge size of the short-term interest rate markets combined with the vastly differing constraints and objectives of the participants in the market makes for value dislocation across assets and sections of the term structure. Strategies are employed that seek to capture the expected value caused by such dislocations.

Investment Process

The fund adheres to an investment process that has been refined over time. This section explains the various stages of that process.

Overview of investment process

Whereas the fund manages a discretionary investment portfolio, it strives to implement a systematic, top-down approach to the investment process. This begins with a period of open-ended research that helps to identify areas of value opportunity. The research will typically focus on one or two areas applicable to a given market such as the US Housing market or the Australian NAIRU. The reason for this is straight forward and best articulated by the Nobel Laureate Daniel Kahneman when referring to his research on the Conjunction Effect. *"The finding that a conjunction often appears more likely than one of its components could have far-reaching implications. We find no good reason to believe that the judgements of political analysts, jurors, judges, and physicians are free of the conjunction effect. This effect is likely to be particularly pernicious in the attempts to predict the future by evaluating the perceived likelihood of particular scenarios. As they stare into the crystal ball, politicians, futurologists, and laypersons alike seek an image of the future that best represents their model of the dynamics of the present. This search leads to the construction of detailed scenarios, which are internally coherent and highly representative of our model of the world. Such scenarios often appear more likely than less detailed forecasts which are in fact more probable. As the amount of detail in a scenario increases, its probability can only decrease steadily, but its representativeness and hence its apparent likelihood may increase. The reliance on representativeness, we believe, is a primary reason for the unwarranted appeal of detailed scenarios and illusory sense of insight that such constructions often provide."*

Once an opportunity is identified, relevant research and analysis is synthesized in order to make the case for a trade that exploits such an opportunity. When the trade rationale reaches a sufficient degree of clarity and cohesiveness, it is necessary to examine a sequence of criteria that may highlight weaknesses of the trade. In turn, this may require revising the original trade rationale in order to account for any shortcomings in the analysis. Provided that the conditions are favourable, the trade is then executed. An open trade is monitored during its lifetime, and its trade management details are reviewed at the weekly disconfirmation meeting. When the trade is closed, a thorough appraisal of the trade is conducted that examines it's realised versus anticipated expected value.

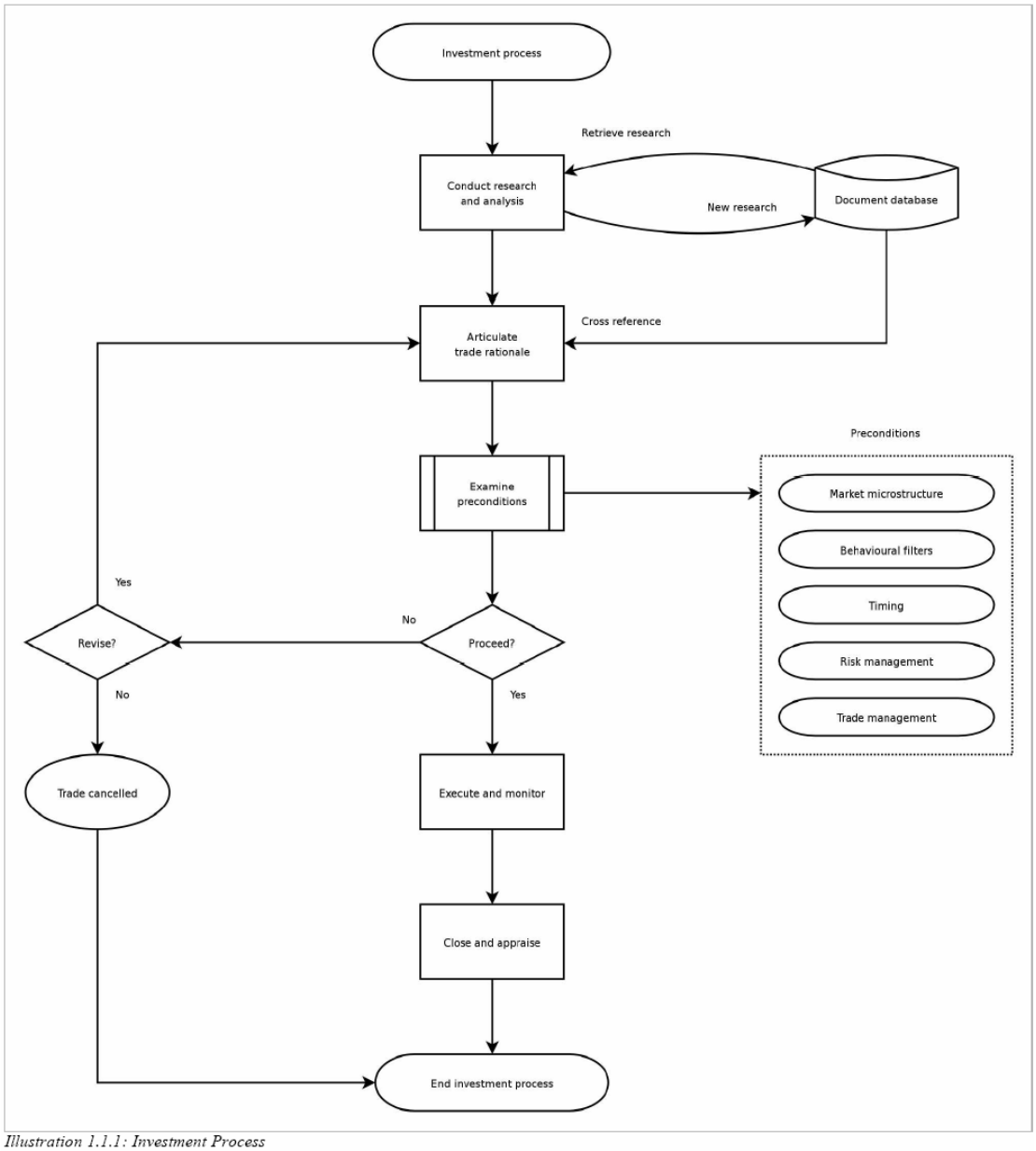

Illustration 1.1.1: Investment Process

Research and analysis

The purpose of conducting research and analysis is to identify value dislocation by developing an independent view of what a given central bank will or will not do, and investigating whether or not the market shares and reflects that view. The focal point of this phase in the investment process is monitoring the publications that the central banks in the G10 produce officially. This includes speeches, inflation reports, monetary policy reports, minutes of meetings, and economic reports. Examining the output of central bank research departments and independent research groups, and searching online economics research repositories such as REPEC and SSRN for academic papers may also highlight relevant avenues of research. This often results in an exponential cross-referencing process once a relevant paper's bibliography is examined. In order to manage this process, research papers and publications are examined, annotated, and cross-referenced with other documents. This may provide the catalyst for initiating new internal research papers, which may or may not be completed concurrently. In addition, any economic variable or driver of central bank policy for any given country in the G10 can be investigated. This can involve obtaining relevant data from

Bloomberg or the web sites of relevant institutions and conducting independent analysis with that data.

Trade articulation

Articulating the rationale for a trade exposes and clarifies the thought process that has led to the belief that a particular value opportunity exists by allowing the case for the trade to be subject to scrutiny. Furthermore, it provides a point of reference for persons that need to understand the motivation for the trade at the time it was conceived, without consulting the primary sources of research that underpin the trade rationale. In this phase, fundamental research is summarised in an original document in an attempt to justify the trade. This involves collecting and reviewing relevant documents and their annotations. It may also involve creating new spreadsheets and charts, or taking snapshots of live spreadsheets, that need to be associated with the trade. The entire process may take a number of days, and can result in a fairly lengthy document.

Trade preconditions

Before a trade can be executed, it is necessary to consider a set of criteria that are designed to reduce the proportion of suboptimal trades that are executed. Examining these preconditions provides a systematic approach to what is essentially a discretionary trading process. However, the sequence in which these are examined is less important than the need for all of them to be thoroughly considered. Subsequent to this analysis, a trade that is judged not to be expedient is archived since the analysis that had been performed may nonetheless be useful at some future time. A trade is never deleted.

The preconditions are as follows:

• ***Market Microstructure***. Assessing the microstructure of the market assists in judging optimal timing and trade location. This involves examining the technical set-up of the market along the range of institutions to determine the positioning of players in the market and how those players are expressing their position. This information is obtained through general market intelligence.

• ***Behavioural Filters***. The purpose of the filters is to identify and remove bias in the cognitive process that has led to the trade rationale. Each filter is designed to counteract specific biases that commonly affect traders and this is intended to reduce suboptimal trades in the portfolio. The analysis is conducted by considering whether any of the biases has affected the thought process underlying the trade, and to what extent.

• ***Trade Management***. Determining all the aspects of trade management prior to executing the trade reduces suboptimal trading and provides an audit process. There are five aspects to trade management: expected value analysis, stop level, future actions, sizing, and timing. The analysis is conducted by examining each aspect of the trade and justifying the choices that are made at that point.

• ***Expected Value***. Determining the expected value of the trade at the outset helps to determine whether the trade is actually worthwhile based on the chosen parameters. In a more complex trade, it can clarify whether the way the trade is structured maximises the expected value. When compared with the realised value of the trade, it also provides a point of reference for generating performance statistics. In order to conduct this analysis, the outcomes of a trade are partitioned into a set of mutually-exclusive scenarios. Each scenario consists of a subjective probability and a corresponding value for that outcome expressed in ticks (basis points). The expected value of the trade is then computed as the sum of the probabilistically-weighted scenario values. At the same time expected value is also computed in terms of cash to facilitate expectation versus realisation calculations.

• ***Stop Level***. An essential aspect of any trade is not to get stopped out; selecting a suitable stop level is therefore an essential part of trade management. The stop can be expressed in

terms of money, basis points, standard deviation or time. This analysis involves determining the stop level and explaining why the particular stop was deemed appropriate.

• ***Future Actions***. Describing any future plans for the trade ahead of time acts as a reminder and allows other individuals to understand the evolution of the trade. For example, this may include factors that might make it attractive to increase the position size. Any future actions such as exit plans or position adds are described, if they are known in advance.

• ***Sizing***. Specifying the sizing of the trade allows a meaningful assessment of the trade's impact on the overall portfolio to be carried out prior to executing it. This involves writing a comment describing the sizing of the positions and justifying those choices.

• ***Timing***. Specifying the timing of the trade clarifies the conditions under which the trade should ideally be executed and acts as a reminder for future reference prior to execution. This involves writing a comment describing the timing for the trade.

• ***Risk Management***. Performing a quantitative risk assessment of the trade's impact on the portfolio can highlight potential problems that executing the trade might cause, and may lead to a reconsideration of the way in which the trade has been expressed. It may also lead to substituting the trade for one that has already realised most of its expected value in order to minimise the overall risk of the fund. Assessing the risk of a trade involves determining how the trade as it is conceived in terms of sizing fits into the portfolio.

Trade execution and monitoring

Once a trade is executed, it is monitored from time to time along with the other trades in the portfolio in order to ensure that it is performing as expected, particularly if it is trading badly. Furthermore, anticipated and unanticipated events of a fortuitous or calamitous nature may require adjusting the construction or sizing of the trade.

During this phase, the trader keeps an eye on the markets but may be preoccupied with other aspects of the investment process, such as conducting original research. Additionally, individuals unfamiliar with the trade may need to understand the salient features of a trade, and in particular the appropriate stop level, in the event of a market crisis and the absence of the trade's originator.

As a result, it may be necessary to periodically review the trade's expected value target, stop level, and commentary on future actions. This becomes more relevant once there are a number of trades that are simultaneously open. Any changes that are made to the trade are documented along with its trade management details but are clearly flagged as an appendage.

Dis-confirmation Meetings

Each Friday we hold a Dis-confirmation meeting, at this meeting a portfolio manager has the role of arguing against the position held by another portfolio manager. This ensures that the positions are regularly re-appraised from a critical rather than affirmative standpoint.

Closing and trade appraisal

When the trade is closed out, a post-mortem analysis is conducted that provides an opportunity for the trader to determine the reasons for its success or failure. In doing so, the trader develops a body of knowledge that can be employed to improve future judgements.

In this process, a written analysis is conducted that identifies the factors that contributed to the trade's outcome and highlights the lessons that had been learnt. This involves investigating which areas of the investment process were optimal or suboptimal, and may involve a more detailed criticism of the way in which the trade was constructed or managed. For example, it may be necessary to examine whether the initial subjective assessment of

scenario probabilities was skewed and provide an exposition of the reason for that excessive skew.

Additionally, the trade's realised value is documented for future reference and an attempt is made to reconcile any discrepancy between its anticipated and realised values.

Risk Philosophy and Management.

"Developing a culture of risk management is just as important as quantitative analysis in the quest for managing risk."

Qualitative Risk Management

Investment Management comprises attitudes and actions which create and maintain a margin of safety and thereby reduce the risk inherent in the investment process and operations. STIR is not in the first order seeking to reduce the short term variability of its portfolio's worth but seeking to maintain the consistency of the investment process we have faith in, one part of this is quantitative risk management but the process contains many other layers that could be termed qualitative risk management.

STIR closely monitors developments in the field of Decision Making Theory and Behavioural Finance and communicates with experts in that field including Daniel Kahneman, Paul Slovac, Terrance Odean. We have a primary objective of improving the quality of the investment decision prior to the imposition of quantitative constraints, by increasing the efficiency of the decision making process the volatility of returns will be reduced for a given level of VAR.

In practical terms this means:

a) STIR constantly seeks to improve the quality and increase the diversity of information we have access to.
b) STIR seek to improve our ability to interpret this information.
c) STIR seek to reduce the psychological biases which mar our judgement.

STIR avoid the consumption of primary data. Discount secondary data and eschew information that has been mediated by brokers, advisors, analysts and journalists. STIR focus on academic medium term empirically based research papers and the data that accompanies them.

STIR follow closely behavioural and experimental finance abstracts in order to benefit from the combined insights drawn from economics and psychology that illuminate the source of financial misjudgement.

STIR monitor closely traders' emotional state, looking out for any emotional discordance that may express itself through the investment process.

STIR does not have a policy of tolerating sub-optimal investments for the sake of diversification. STIR aims to forego sub-optimal investments at the risk of missing opportunities in order to improve the risk profile of the portfolio.

Philosophy of Worry!

- STIR looks for problems.
- STIR encourages active discussion of issues and trading strategies.
- STIR fosters an atmosphere of worry with particular focus on specific areas.
    - ✓ Worry about options exposure.
    - ✓ Worry about liquidity issues.
    - ✓ Worry about dealer marks.
    - ✓ Worry about stops.
    - ✓ Worry about "normal" and "abnormal" market conditions.
    - ✓ Worry about style and universe drift.

Stops

Information about stops is available on the daily trade blotter, whether the stop is triggered by a money amount, a price or a time lapse or a standard deviation move. Stops are enforceable by senior management if there is a delay in execution.

Imposition of a quantitative framework onto the above qualitative elements.

In order to maintain clarity over the implications of the investment process it is important to have quantitative data and quantitatively derived limits. To assist in analysing the risk in the positions and portfolio STIR uses the GlobeOp Risk platform.

Portfolio Risks

STIR observes the risk at a portfolio and strategy level and seeks to target a VAR of between 1.5% and 2% at 99% confidence a day with a limit of 3%.

Risk Concentration

STIR monitors for risk concentration by dividing the yield curve up into 3 month buckets out to 4 years and measuring for a variety of factor sensitivities in each bucket. These sensitivities include, DV01, Convexity/Gamma, Slope, Butterfly, Vega/Carry etc.

Relative Value

The relative value section of the portfolio is observed differently and managed differently. Particular emphasis is given to future scenario analysis as well as historical scenarios to confirm the efficacy of the hedge and cutting trades is driven with reference to standard deviations rather that absolute price targets

Position vs Portfolio Risk Assessment

At STIR there are two fundamental levels of risk analysis performed, the first level of analysis being concerned with the risk of individual positions considered in isolation, the second level being concerned with portfolio-level risk and aggregate risk factors.

The first and lowest level of analysis is of individual position risk. A VAR calculation is made for each position in the portfolio. While a position VAR is by itself not very meaningful

(the variable is not additive), it is helpful in certain contexts. One obvious application is the insight this position-by-position analysis gives in estimating how much risk a position is exposing the portfolio to in a crisis environment where correlations go to 1. The position-level VAR also helps identify more elusive risks like liquidity. For example, a very liquid short futures position and an illiquid long bond position may have a high degree of negative correlation, but the asymmetry of liquidity between the two positions is an additional source of risk that is hidden in total, conditional, and marginal VAR calculations performed in the second, higher level of risk analysis (discussed below). By examining individual position VAR figures and weighing them by some (usually subjective and contextual) liquidity measure we get a more complete perspective of the overall portfolio risk.

Factor sensitivities are also computed for each position. These sensitivities are, of course, largely used in constructing position-level hedges. Here are the factors that we look at:

DVO1 Sensitivity: sensitivity to a parallel shift of the entire term structure by 1bp up or down.

Convexity/Gamma: Second order sensitivity to a parallel shift in the yield curve.

Slope Sensitivity: Factor scenario where the entire zero coupon curve steepens, calibrated so that 3 month to 5 years steepens by 1bp.

Short-term YC: Factor scenario where the short-end of the zero coupon curve rallies, calibrated so that the short-end of the zero coupon curve rallies. 3m rally by 1bp, 6m by .3bp, 1Y and after by 0bp.

Butterfly: Factor scenario where the belly of the zero coupon curve outperforms the wings, calibrated so that 1Y and 5Y do not move and 3Y rally by 1bp.

Theta/Carry: Measure of the carry and option decay showing the effect of a next day re-pricing of the portfolio.

Vega: Sensitivity to fixed income implied market volatility.

Sensitivity FX: Sensitivity to a change in a foreign exchange rate.

Portfolio

The second and highest level of analysis is a VAR measure of the entire portfolio. Given the non-normal properties of short-term interest returns, it would be inappropriate to put too much emphasis on a traditional parametric VAR measure. We calculate both a Monte-Carlo VAR and a historical simulation VAR in addition to the standard delta-normal VAR calculation.

The Monte-Carlo VAR is the most fundamental of the three measures in our risk methodology, and it provides the starting point for STIR's risk analysis; on any given day this measure must not exceed the daily VAR limit specified in the relevant documentation.

Conditional and marginal VAR calculations are performed on the risk factors that we believe best capture the risk of the portfolio. For example, one such factor is the swap spread. A portfolio VAR conditional on the swap spread factor is the VAR calculated under the assumption that swap spreads are the portfolio's *only source of risk*. The converse measure is the marginal VAR relative to the swap spread factor, which is calculated *excluding* the swap spread factor. Both measures are expressed as a percentage of the total VAR figure calculated in the first level of analysis. So, to continue with our example, a VAR conditional on swap spreads that equalled .11 would suggest that if all risk factors but swap spreads were

hedged, the portfolio would have a VAR of a little more than 10% of the total VAR. A VAR marginalized on swap spreads that equalled .19 would suggest that the portfolio's VAR could be reduced by almost 20% if swap spread risk was hedged.

The factor sensitivities discussed above are also run on positions aggregated into maturity buckets of 3M, 6M, 9M, and all the 3 month buckets out to 4 years mirroring the Eurodollar strip, a modification made to the GlobeOp Risk system to tailor it to STIR's short-term focus.

STIR also runs up to 6 scenarios on the portfolio; these take in possible macroeconomic shocks as well as leverage shocks. STIR constantly seeks to monitor the scenarios which represent an unwinding of leverage. (Often the scenarios which hurt funds the most.)