

Real-Time Currency Valuation in the Global FX Marketplace

Marketplace Challenges and Opportunities

Introduction to the CüreX[®] FX Ecosystem

A White Paper Presentation

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Real-Time Currency Valuation in the Global FX Marketplace

Introduction to the Cürex FX Ecosystem

Proprietary FTSE Cürex FIX and FX Index Methodology Cürex Financial Products and Cürex FX ECN Technology Solutions

Introduction

Over the last twenty five years, the growth of global economic trade, increased movement of investment capital across borders, and the proliferation of financial technologies have led to a tremendous growth in the daily volume of international financial transactions. While access to data has never been easier, many of the world's largest financial markets remain misunderstood and opaque to the majority of users who must transact in them every day. Foreign Exchange ("FX") is a unique marketplace that is a utility to most of its users while being a substantial source of revenue to a sub-sector of market participants. It is also unique in that even today, there are very few ways in which market participants can receive reliable price discovered data for FX transaction cost analysis, risk analytics and asset valuation on a real-time basis throughout the twenty-four hour, five day per week cycle during which global FX markets are open and active. The introduction of new FX fixing systems and methods are enabling a next generation of financial products featuring improved data analytics and more competitive investment strategies not previously accessible by the wider investment public, all based on a foundation of price transparency and fair dealing.

The global FX marketplace is a fragmented network of bilateral counterparty relationships that transact with one another directly and via intermediaries through a myriad of financial transaction hubs and dealing desks. The activity of this market,

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estimated to be in excess of \$5 trillion United States Dollar (“USD”) daily volume, largely occurs over-the-counter (“OTC”) through discreet electronic and verbal communications and without the benefit of the transparent price discovery enjoyed by participants who transact on regulated, public stock exchanges where such activity is captured on the “Consolidated Tape.” This inherent opacity and the structural fragmentation in the OTC FX marketplace presents unique problems as it relates to the accumulation, calculation and dissemination of foreign exchange data for the purpose of real-time currency pair valuation (“FIX”) and the valuation of indices made up of multiple constituent FIX currencies (“FX Indices”). Given that the size of investment management mandates linked to indices at the world’s top 11 passive asset managers is now estimated to exceed \$8 trillion USD¹ (with unofficial global estimates of passively managed assets topping \$55 trillion USD) and that all such indices have FX exposure embedded into their calculation methodology, the method by which data is captured, calculated and then used in relation to those mandates across all asset classes is of paramount importance to the global investment community.

As global commerce, passive investment mandates and financial technologies grow dramatically, so grows the need for a next generation platform of benchmark FX FIX rates and FX indices that are transparent, audited, executable, and offered on a continuous, real-time basis throughout the OTC FX trading day. Such data should emanate from an electronic FX marketplace (“FX ECN”) that displays substantial, two-sided (simultaneous Bid and Offer) liquidity from the world’s largest major FX dealer banks as well as independent, non-bank FX market participants who are free to place transparent orders into a live, dynamic market on an anonymous basis. Such liquidity must be offered with no hidden price spreading, liquidity segmentation or other forms of interference as can be the case on legacy electronic FX brokerage platforms. Furthermore, FX ECN market participants must be restricted from having the ability to reject trades after orders are matched to ensure the elimination of data in such an FX FIX that is not otherwise executable (“Liquidity Mirage”). The liquidity on such an FX ECN must be offered under a

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transparent, common execution rule set with a transparent treatment of credit to avoid data fragmentation and further Liquidity Mirage. Such liquidity must also be supported by a material number of major FX dealers who are obliged to stream their liquidity during all OTC FX market hours, with minimum size requirements.

Many of the largest electronic platforms from which data is currently derived do not carry these obligations and thus only generate data that represents market participants' interest when they wish to relieve themselves of FX risk taken in bespoke, bilateral transactions. This type of data can lead to pockets of illiquidity, mispricing and degradation of data quality when such data is relied upon for intraday or end-of-day ("EOD") valuation of financial assets. Many market participants who use such data for asset valuation and transactional price benchmarking are unaware of the condition under which this data is generated, leading to valuation marks that are susceptible to price anomalies.

The solutions for FX FIX data contribution proposed in this paper are designed to ensure market participants have confidence that there is a consistent discipline applied to the prices making up the FX FIX that are used for their investment valuations and transactional analysis. The FX FIX method outlined in this paper is not reliant on a survey of prices taken during a pre-determined time of day. Furthermore, executions at the new FX FIX rates can be affected by any market participant on an anonymous, agency basis, 24 hours per day and five days per week (during all institutional FX market hours). Market participants are not limited to disclosed, bi-lateral principal executions at pre-set "time-of-day" Fixings as is the case with current legacy FIX rates used predominantly in EOD asset valuation calculations. The new FIX system described in this paper introduces an exciting, new capability to global capital markets that allows market makers and portfolio managers to reduce or eliminate tracking error, lower frictional costs and improve liquidity provision to financial products that adopt the new FIX rate system for their asset valuation calculations.

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This paper introduces an improved, next generation FX FIXing system that uses new financial technologies to gather FX rate data generated by prices that can be executed upon through agency transactions on a continuous basis throughout the trading day. The structure proposed eliminates potential conflicts of interest inherent in the legacy FX fixing rate regimes predominant in today's market. Legacy FX fixing rate executions, used by the majority of market participants, can only take place by way of a principal, bilateral transaction with a liquidity provision intermediary who knows of their counterparty's intention (identified buyer or seller) before the FX fixing time. When FX fixing rate intermediaries are taking principal risk to fulfill a transaction at an indicative rate, there is a need for the intermediary to trade during the time window when the FX Fixing rate is set in order to manage their financial risk. Such legacy systems create potential conflicts that are undesirable to both liquidity providers and liquidity takers. With the availability of a new FX FIX rate system, facilitated by next generation technologies, those responsible for choosing FX rates used in asset valuation, index calculation, risk management and transaction cost analysis now have a choice and an opportunity to improve their process methodologies.

The aggregate risk exposure assumed by price contributors who are required to stream two-sided, executable liquidity (orders that cannot be rejected when matched) across many pairs during all OTC FX market hours on an FX ECN specially purposed for the transparent recording of such data, greatly reduces potential moral hazard that can be associated with the contribution of indicative quotations to indicative foreign exchange FIX benchmarks or other forms of indicative FX pricing. The aforementioned moral hazard occurs because such indicative quotations are used to value assets when third parties have substantial capital at risk; however, such indicative quotations are provided by selected contributors who have relatively little or no capital at risk associated with the provision of such quotations. While indicative FX pricing helps to smooth volatility associated with streaming FX market price activity, the use of such rates for time-of-day asset valuation, both in financial product valuation methodology and financial index pricing methodology,

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creates a market issue when transactions are required to be affected at such rates in order to eliminate tracking error.

Nevertheless, the need for third-party validated FX price provision is so acute in the capital markets that the use of such rates is now expanding into applications for which they were not intended. Increasingly, such indicative FX rates are being used for FX price execution validation especially in circumstances where there are fiduciary obligations associated with FX execution. At first glance, the reference of a third-party validated FX price fixing looks like an elegant solution to the problem of validating an execution price in a fragmented, opaque marketplace. However, the use of indicative FX rates at bespoke times of day can create unintended consequences such as those discussed in this paper.

When such factors are taken into account, it is evident that an opportunity exists for fiduciaries, regulators and index providers to correct a basic flaw in capital markets valuation protocols. Current systems are unintentionally creating conditions that can lead to a temporary suspension of market driven price discovery and market dislocation in global FX markets during certain time windows when indicative fixed time-of-day FX rate observations occur.

The introduction of a new, streaming executable FX benchmark FIX, such as the one described in this paper, allows for market participants to diversify the times throughout the day when they choose to value assets and execute related FX transactions. Given current “Time-of-Day” FX Fixing rates used predominantly throughout global capital markets, brokers are forced to execute FX FIX client orders as principal counterparties. These brokers collect orders throughout the day and execute at the time of the FX fixing. The collection of aggregate orders (bids and offers) affords the executing broker with an informational advantage, given that the broker has access to a broad aggregation of client orders that are being collected throughout the day and can see the net bid or offer order book prior to the Fixing event. Armed with such knowledge, the executing broker can

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assess net client interest and attempt to price markets at the relevant FX Fixing times to maximize profits and minimize losses on their principal executions offered at the FIX price.

While this may or may not seem reasonable to the casual observer, it is a pragmatic approach to FX risk management in response to a system that has been fostered by those in the capital markets who rely on indicative FX rates for EOD valuation purposes. Accordingly, current asset valuation conventions that concentrate FX risk around conventional “Time-of-Day” FIXing events are contributing to temporary market dislocations in FX markets. The growing proliferation of FIX related order flow is accentuating this problem in OTC FX markets, creating a need for new FIX technologies that enable new “agency” FIX execution capabilities and alleviate the current “principal” FIX execution limitation.

Expanding the choice of FIX rate execution times throughout the 24 hour FX trading day coupled with the expansion of FX FIX rate order execution capabilities to include agency brokers and electronic brokerage platforms globally, will significantly improve the functionality of the FX markets during these windows of time. With such new capabilities and the corresponding embracement by index providers, product sponsors and investment managers with passive mandates linked to such FX FIX rates and FX indices, the concentration of FX risk surrounding mark-to-market asset valuations can be successfully addressed even in the context of the fragmented FX markets. A new form of market interaction with a diversified schedule of FIXing times and a broader distribution of corresponding FX risk across a wider array of capital market participants would be favorable for investors who seek long term price stability and sustainable liquidity consistent with orderly markets.

The incentive to track such indicative FIXing rates with minimal tracking error creates a natural demand by asset managers to execute cash flows related to financial product net asset flows with FX executing brokers offering agency access to FIX transaction executions. Index providers, product sponsors and fiduciaries who create the benchmarks

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that asset managers seek to track should consider the negative impact of using the same indicative FX rates and time-of-day across all asset classes and assets domiciled in all jurisdictions. Aligning foreign asset valuations to the times-of-day when the corresponding foreign markets close (and value their assets domestically) would be a good first step to diversifying the concentration risk being created with legacy time-of-day EOD valuation methodologies.

The growth in the number, size and geographic location of financial products that embrace these new FX FIX and FX index methodologies serves the dual purpose of improving investor access to new investment opportunities while also serving to break down silos that have fragmented market liquidity. In conjunction with their use of the new FX FIX rates for valuation purposes, these financial products can utilize proprietary Cürex patented technologies to isolate, hedge and alter FX risk exposures with spot FX contracts. This is in contrast to the less efficient use of FX forwards which are less liquid and more difficult to price discover in electronic markets. The use of spot FX enables an unprecedented link between OTC FX markets and these next generation financial products increasing liquidity, reducing tracking error and improving financial product performance.

These new FX benchmarks (FIX and FX Indices) can now be collected and organized to provide historical time and price data and to provide the financial markets with a more accurate reference for the value of currency pairs and baskets at any time of day to varying depths of executable liquidity (representing both bids and offers). Such data therefore represents an accurate reflection of executable liquidity available in the OTC FX markets at any point in time.

Prior to the launch of the FTSE Cürex FIX and FX Index Series in 2012, no such benchmark for valuation of OTC FX existed, and today it is the only solution of its kind in the financial marketplace. Previously, the only published indication rates were either time delayed or opaque in regard to the rules and conditions under which their data was collected. Aside from the FTSE Cürex benchmarks, current live trading venues do not provide accurate time and price data that represent commonly accessible liquidity under transparent rule sets. While there are

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streaming liquidity price feeds, the data that emanates from such venues is fragmented and gathered under opaque rule sets. Many data sets include quotes that can be rejected after a match occurs and are never intended to be executed (Liquidity Mirage). Other platforms do not require market participants to provide two-sided (bid and offer) quotes simultaneously or in minimum sizes, allowing for the posting of prices based on informational advantage rather than executable liquidity.

As a result of the imperfect nature of historical benchmarks, there is a pervasive discontent among institutional FX market participants, fiduciaries and buy-side investors who must transact and move capital in a global marketplace as well as with regulators who require greater access to reliable data upon which they can perform analysis. Flaws in indicative benchmark pricing are endemic, and there is a growing opinion that where liquidity can be proven to be sufficiently available, market-based FIX pricing, referencing executable liquidity, is a superior model to indicative FIX quotations.

FTSE Cürex FIX and FX Index solutions are both supported by executable liquidity generated from the price discovery activity of participants on the Cürex FX ECN platform, which include most of the world's leading FX dealer banks. Additionally, data is captured as a result of price discovery activity that emanates from the growing array of financial products and investment mandates that embed the use of FTSE Cürex FIX into their product intraday and EOD asset valuation calculations. FTSE Cürex FIX and FX Indices are supported by an ecosystem of global OTC and exchange-traded products, proprietary financial technologies and data products that link OTC FX liquidity to exchange traded markets and other OTC markets globally. This ecosystem creates new opportunities to deliver transparent FX price data throughout global financial product distribution channels across all asset classes. It does so while maintaining current economic incentives for FX buy-side clients and FX sell-side liquidity makers. Additionally, it enables new product revenue streams for financial product sponsors and their service providers, through an entirely new generation of financial products that can provide investors with enhanced yield, improved diversification and more efficient risk management. Whether it is FTSE Cürex FX FIX rates, benchmark baskets, or intelligent FX strategies, Cürex's

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solutions are designed to meet a diverse set of user objectives with a common approach to data integrity and quality for the benefit of investors in both developed and emerging capital markets.

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Overview of Global OTC FX Marketplace

The global OTC FX market is one of the world's largest financial markets. The 2010 Bank for International Settlements Triennial Central Bank Survey entitled, "Report on global foreign exchange market activity in 2010" (December 2010) estimated the total daily volume of OTC FX at that time to equal \$4.0 trillion USD. Of this amount, approximately \$1.5 trillion of daily OTC FX volume is attributable to the trade of spot FX contracts.

A spot FX transaction is defined as a single outright transaction involving a bilateral agreement between two counterparties to deliver a pre-defined amount of one currency (base currency) in receipt for a specified amount of a second currency (reference currency) at a set date (settlement date, delivery date, or value date) that is within two business days from the date the agreement is entered into by the two counterparties (trade date). The Bank for International Settlements defines a spot FX transaction as a "single outright transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) within two business days."

A conventional FX Exchange Rate or Spot FX Rate is generally determined by the amount of reference currency divided by the amount of base currency and is typically quoted in an amount of reference currency per one unit of base currency. An inverted FX Exchange Rate or Spot FX Rate is generally determined as an amount equal to one (1) divided by the conventional FX Exchange Rate or Spot FX Rate and is typically quoted in an amount of base currency per one unit of reference currency.

FX Market Conventions

In every FX transaction, one currency is purchased and another currency is sold. The currencies that are purchased and sold in a foreign exchange transaction are also referred to as a currency pair. A currency pair consists of a base currency and a reference currency. EUR/USD is an example of a currency pair. In this example, the base currency is EUR and its value remains constant at one EUR. The reference currency is USD. The value of the reference currency fluctuates higher and lower relative to the base currency. For example, if the

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EUR/USD currency pair is quoted at 1.1500, it means that one EUR costs USD 1.1500. Likewise, if the EUR/USD currency pair increases to 1.2000, the same EUR is now equivalent to USD 1.2000. Currency transactions can be quoted in one of two ways: (i) American-terms, in which a currency is quoted in terms of the number of USD per unit of foreign currency (*e.g.*, how many USD to buy one EUR), and (ii) European-terms, in which one USD is quoted in terms of number of units of foreign currency per dollar (*e.g.*, how many Swiss Franc (CHF) to buy one USD). The same logic can be applied to currency pairs in which the USD is not one of the currencies. Either currency can be expressed in terms of the other. However there are generally accepted conventions in the Interbank foreign exchange marketplace that have been adopted by all participants in the foreign exchange marketplace. For example, the EUR/USD pair is quoted in American Terms and the USD/CHF is quoted in European Terms.

A currency transaction that does not involve USD on one side of the transaction is called a foreign exchange "Cross" and the amount of reference currency the market determines is required to deliver for one unit of the base currency is called the "Cross Rate." EUR/JPY is an example of a currency pair Cross. In this example, the base currency is EUR and its value remains constant at one EUR. The reference currency is Japanese Yen (JPY). The value of the reference currency fluctuates higher and lower relative to the base currency. For example, if the EUR/JPY currency pair Cross Rate is quoted at 117.50, it means that one EUR costs JPY 117.50. Likewise, if the EUR/JPY currency pair Cross Rate increases to 120.00, the same EUR is now equivalent to JPY 120.00.

It is worthwhile noting that a USD based investor who is speculating in the EUR/JPY spot OTC FX market would earn profits from his transaction in Japanese Yen and would have to perform an additional calculation of USD/JPY to calculate its profits in USD terms.

In currency trading, a long position refers to entering into a contract to buy a fixed amount of base currency in exchange for a set amount of reference currency at a set time in the future. A trader may speculate that the price of a base currency will increase relative to the value of the reference currency by entering into a long position. A risk manager or hedger who has a

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future liability denominated in a base currency may also enter into a long position to protect that manager or its constituents from a rise in the base currency versus the reference currency.

A short position in currency trading means that the trader has entered into a contract to sell a set amount of base currency in exchange for a set amount of reference currency. A trader may speculate that the price of a base currency will decrease relative to the value of the reference currency by entering into a short position. A risk manager or hedger who has a future liability denominated in a reference currency may wish to protect itself or its constituents from a decline in the base currency versus the reference currency by entering into a short position.

FX transactions are executed through FX spot transactions or FX forward transactions. FX spot transactions are exchanges of one currency for another for delivery within two business days or less. The price at which an FX spot transaction occurs is known as the “Spot Rate.” The two day or less settlement period has historically been necessary to allow for trade processing, settlement and for currency payments to be wired around the world. The reduction of time between trade date and settlement date (or value date) reduces systemic risk and is considered desirable among market participants when feasible.

FX forward transactions are exchanges of one currency for another at a future date. FX forward transactions are conducted at a “Forward Rate,” which is the exchange rate available on trade date (at the time of the transaction) for settlement (or delivery) at a specified date more than two days into the future. The Forward Rate is a function of both the Spot Rate at the time of the transaction and the interest rate differential between “Risk Free” or sovereign money market or bond market interest rates of the respective two countries over the same term as the FX forward contract.

The difference between a forward exchange rate and a spot exchange rate represents the benefit or disadvantage an investor would experience should that investor convert in the spot market from one currency represented in the pair to the other and hold the new currency earning interest at a “risk free” rate. To the extent that there is an economic advantage associated with a higher interest rate in the new currency, such advantage is reflected in the price of the FX forward transaction. The difference between the spot OTC FX price and the forward FX rate for

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any specified settlement date is measured in amount of reference currency required to deliver on the chosen settlement date for each unit of base currency.

FX market conventions refer to the difference between spot market price and a forward price in terms of "Forward Points" and can be a positive or negative number depending on interest rate differential between the two countries for the length of term of the FX forward contract. The discount or premium to the spot price in an FX forward transaction of the same pair is typically referred to as the "carry" or "cost of carry."

The OTC FX market operates five days per week on a 24-hour trade date basis beginning at 5 p.m. Eastern Time (ET) Sunday and ending at 5 p.m. ET Friday. A trading day begins at 5 p.m. ET and ends the next day at 5 p.m. ET. For example, on a Monday, a typical spot currency contract trades for value the following Wednesday (assuming no holidays). At a moment past 5 p.m. ET on Monday, the trade date becomes Tuesday and the value date becomes Thursday. A position opened on Monday at 5 p.m. ET is either closed or rolled to the next value date before the end of trading day on Tuesday.

FX Spot Roll Transactions are executed by making two simultaneous trades that result in the same open position with settlement date extended by one business day. The first transaction is an offsetting transaction to the original OTC FX position. It takes the opposite side of the market to the original OTC FX position (long contra short or short contra long) for the same notional amount and same settlement date. The second transaction is for the same notional amount and same side of the market as the original OTC FX position with settlement date extended by one day (a plain vanilla OTC spot FX transaction). Where there is an interest rate differential in the overnight "risk free" rate between the two countries represented in the currency pair, there will be a difference in price between the two legs of the Spot Roll transaction. This difference represents the difference in benchmark overnight interest rates between the two currencies in the trader's open position applied in currency-rate terms (*i.e.*, one day of "carry" or "cost of carry"). It constitutes an amount equivalent to a net interest earned or paid by the trader, depending on the direction of the trader's position and the amount of carry. Assuming there is no change in the FX Spot Rates for the currency pair, a trader can earn money

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in a roll transaction if the trader holds a long position in the currency with the higher interest rate and holds a short position in the currency with the lower interest rate. Conversely, a trader can lose money in a roll transaction if the trader holds a short position in the currency with the higher interest rate and holds a long position in the currency with the lower interest rate. The amount that is ‘made or lost’ is in addition to the amount that the trader could earn in interest in a collateral account that is used to hold cash or equivalents denominated in the reference currency (deliverable currency) that could be used to settle the OTC FX contract.

The OTC FX markets have a convention for naming price points with respect to the value of one currency versus another. The standard price increment unit size is referred to as a “Pip” and is the last digit in the standard four decimal point quotation figure of most major pairs quoted in standard “Dollar equivalent” size convention (i.e. EUR/USD trades at 1.3567 – the 7 figure is referred to as a Pip). In the case of currency units that are quoted in “Penny equivalent” size convention (such as Japanese Yen and Korean Won), the second decimal point is referred to as a Pip (i.e. USD/JPY trades at 85.69 – the 9 figure is referred to as a Pip).

It is now commonplace to see electronic liquidity providers provide prices with one or even two precision points more detailed with respect to price. These price points are called “Teenie” and “Mini-Teenie” respectively. (i.e. EUR/USD trades at 1.3567⁸⁹ – the 8 figure is called a Teenie and the 9 figure is called a Mini-Teenie)

Market Structure

The bilateral nature of the global OTC FX market and its corresponding systems of settlement causes a significant lack of transparency and highly fragmented price discovery, leading to unpredictable liquidity and a remarkably high potential for inefficient pricing of OTC FX transactions for global FX market participants. Currently, the FX Spot Rates in spot OTC FX transactions are not recorded in a central data repository nor are transaction prices published with reference to a specific time of execution. Transaction prices at a specific time within the same geographic region can differ widely among market participants for a variety of reasons including, but not limited to: counterparty risk, customer sophistication, and customer access to competing prices. It can also vary due to liquidity provider sophistication, urgency on the part of

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the liquidity provider to hedge FX risk assumed in normal market making operations, and knowledge the liquidity provider may possess with respect to counterparty interest or trading methodology.

In summary, historically there has been no concept of "Best Execution" in OTC FX markets in the same way the term is understood in regulated equity and commodity futures markets. In many cases, OTC FX traders will offer different counterparties a host of different prices for a specific currency pair at the same moment. These same OTC FX traders may regularly change the frequency with which they disseminate prices to market participants, causing tremendous fragmentation in the global OTC FX marketplace. In this case, we define fragmentation as fragmentation of price, access to counterparty volume, access to timely market data, and access to prices on which the counterparty offering prices intend to transact (Liquidity Mirage).

This market fragmentation leads to a likely probability of inefficiently priced transactions. Traders who have access to larger pools of liquidity and a greater number of potential counterparties and who may be willing to transact at less efficient prices at any specific moment in time, obtain a trading and price of execution advantage over those who do not. In some respects, this phenomenon creates liquidity through the economic incentive of price arbitrage between fragmented liquidity pools, although much of that liquidity is created at the expense of those with less efficient technology, smaller trading networks, more expensive access to credit or less sophistication about FX market micro-structure and the nature of OTC FX trading.

The State of Benchmark FX Rates

Various attempts have been made to establish benchmark FX reference prices for: (i) foreign currency valuation measurement with global investment products; (ii) settlement of international commerce transaction; (iii) national tax revenue calculations; and (iv) the purpose of Transaction Cost Analysis ("TCA"). For various reasons, the marketplace has relied on "Indication" or "Indicative" FX rates. Indicative FX rates are reference rates that are not considered to represent executable prices because the data from which these rates are calculated

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emanate from pools of OTC FX liquidity that are not available to most (or in some cases, not available to any) market participants. This characteristic makes Indicative FX rates a less accurate measurement of FX Spot Rates as matter of price and time and can mislead market participants who use these benchmark rates as a guide for FX TCA or foreign currency valuation measurement in global investment products and commerce. This can be especially concerning in emerging markets where there has been a pronounced increase in trade over the past decade but where FX liquidity continues to be more fragmented and price discovery remains more opaque than in developed economies.

Indicative FX rates may also be significantly time delayed in their publication (significance in this instance would be measured in time intervals of multiple minutes). Some of the most broadly used FX Indices in the global investment marketplace today will delay the publication of their data by upwards of fifteen minutes. Such time delays make these rates and the indices which use these rates problematic for market participants who wish to hedge the currency risk inherent in assets or contracts whose value are tied to such Indicative rate indices. With time delayed Indicative FX Rate or Indices, the FX risk manager or hedge execution trader does not know the valuation of the foreign currency risk exposure until long after the time he can effectively hedge these rates. Many of the most popular Indicative FX reference rates and FX Rate Indices were created with methodology systems established many years ago and were not designed for the purpose in which they are used commercially today. As the FX marketplace continues to grow, embracing new trading technologies and product innovations, the demand to establish better measurement tools and solutions for all users of FX in the global capital markets is clear. FX traders, international investors, importers, exporters, multi-national corporations, pension funds, sovereign wealth funds as well as government treasury departments and revenue collection agencies worldwide stand to benefit from more accessible, timely and reliable FX market data.

It is difficult to conceive how there can be a truly accurate FX benchmark rate for assessing the quality of a price that may have been offered by a counterparty or executed between counterparties at any given moment in time without a streaming, real-time reference FX

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rate that derives its data from an identifiable pool of FX liquidity with a transparent and common rule set for participant credit, liquidity provision and transaction settlement; and which is available to the marketplace during the hours OTC FX trading real-time pricing and accurate timestamps. FX benchmark rates without these characteristics cannot offer the utility required by securities market makers and FX risk managers to effectively hedge risk inherent in global investment products and commercial transactions. FTSE International and Cürex Group have partnered to create new benchmark FX rates, introducing a new standard for FX market transparency that will lead to cost savings for buyers and sellers of FX regardless of their reasons for transacting in the marketplace. As electronic FX execution technologies have advanced liquidity, competition and lower cost of execution, so now can new FX Benchmark Index methodologies and supporting technology promote transparency and accurate measurement of FX price discovery at any specific moment in time.

FX Market Access, Liquidity and Speculation

FX market participants transact in the global FX OTC market for many reasons. Those reasons can be broadly categorized as either risk management, the settlement of transactions relating to global investment or global commercial trade, Central Bank market intervention, and government sponsored currency sterilization. In addition, a large portion of each day's volume can also be attributed to FX speculation and/or price discovery between liquidity pools in the electronic OTC market.

High Frequency Trading ("HFT") speculators provide tremendous value to the function of the OTC FX marketplace by delivering liquidity to those who seek to transact or manage risk in the global OTC FX marketplace. The provision of liquidity in a specific currency pair promotes orderly markets, connects liquidity between fragmented liquidity pools and serves to protect a currency pair from predatory speculation. Predatory speculation involves the use of large sums of capital and/or leverage on one side of the market to artificially move the price of an illiquid currency pair away from where the marketplace would otherwise discover price. This may push a price through an option trigger price or another price level for a short period of time (such as during a daily time-execution FIX) in such a fashion that the predatory speculator

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profits at the expense of another group of market participants with similar (in many cases disclosed) objectives. The more liquidity in a specific currency pair, the more capital and/or leverage is required to successfully move its price temporarily. At some point, there is sufficient liquidity to make predatory speculation cost prohibitive and this order flow will cease activity. Predatory speculation has been a source of problems for Central Banks in the past, especially in emerging markets where liquidity can be difficult to source.

Advances in electronic networking and trading technologies, including improved stability and speed of electronic telecommunications along with the expansion of the global bank FX Prime Brokerage industry, have led to important changes in spot OTC FX market liquidity provision during the past decade. In this market where customers of FX ECN and electronic matching hubs can trade both anonymously and disclosed to their counterparties including peer-to-peer execution on bank secured credit, Non-Bank Financials including HFTs have grown to account for over 50% of total volume in spot FX according to the BIS 2010 Triennial Survey.

It is worthy to note that Non-Bank Financials and HFTs do not enjoy similar market share in OTC FX forwards and OTC FX Options where electronic trading is less prevalent and orders are still dominated by direct single bank platforms and voice execution. Liquidity in these markets has not grown as fast, leaving them ever more fragmented. According to the BIS Triennial Survey, OTC spot FX volumes grew over 50% between the years of 2007 and 2010. By comparison, OTC FX Options whose volumes are dominated by banks and whose contracts do not typically transact on multiple counterparty FX ECNs, saw volume drop over the same period.

Non-Bank Financials and HFTs perform an important role in the global FX marketplace of providing liquidity for corporations, governments and investors transacting in the global economy. At the same time, this market segment has become ever more reliant on credit from the bank FX Prime Broker network, sourcing the credit on which they rely from the very banks with whom they may compete in the OTC FX markets. These users are likely to increasingly look for credit solutions that reduce inherent conflicts of interest and business risk as new FX credit solutions and products become available in global capital markets.

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Regulators, liquidity providers and a large cross-section of market participants have expressed an interest to see such HFT behavior curtailed in the market. However, legacy business models at electronic trading venues, such as ECNs and Exchanges, are typically highly leveraged to trading volumes and thus highly susceptible to a slowdown in such trading volumes. HFT business models create extraordinary short-term financial pressure for some ECNs and Exchanges to enable and even encourage such behavior.

History documents that long term solutions to issues like these will not likely emerge from regulation, duties or transaction taxes as have been proposed in various jurisdictions. Such non-market based solutions will ultimately curtail liquidity and add to price volatility damaging investor confidence and the economic well-being of these economies. Rather, the market must consider the adoption of new business models that focus on “value-added” solutions for global asset owners and financial product sponsors. With this focus, real-money demand for FX liquidity can be aggregated in an anonymous setting under common, transparent rules allowing liquidity providers to compete for such order flow from this market segment. Under such conditions, platforms can impose conditions that promote sustainable liquidity. Similarly, under such conditions a financial incentive would exist to curtail behavior by market participants not conducive to sustainable liquidity or the integrity and long term viability built from such a platform. In such a market, a balance can be struck between high frequency behaviors that are accretive to liquidity while curtailing behaviors that are counterproductive to the long-term viability of the financial products from which this liquidity seeks to profit.

FX rate price volatility in many emerging market and frontier market currencies imposes great challenges on global Central Banks and governments in their efforts to affect stable monetary policy, grow domestic capital markets infrastructure and attract long term sources of finance denominated in local currency. Lack of volume and access to counterparties willing to deal in these currencies keeps many liquidity providers away from these markets.

According to the Bank for International Settlements report, “The \$4 trillion question: what explains FX growth since the 2007 survey?” (BIS Quarterly Review, December 2010), a majority of the \$500 billion USD growth in spot FX volumes between 2007 and 2010 can be

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attributed to the growth of electronic FX trading on ECN or similar electronic brokering platforms. Of that growth in OTC FX volume, empirical evidence suggests HFT Non-Bank Financial companies, as a group, were the largest contributor to additional liquidity in the global FX marketplace. In markets where there was not significant electronic trading or HFT participation, growth in volume was stagnant or even negative over the same period.

Speculation in emerging market and frontier currencies tends to be less about price discovery (a productive source of speculation in terms of promoting orderly and fair markets) and more about short term price manipulation (an unproductive source of speculation in terms of promoting orderly and fair markets) by those with a competitive edge in terms of access to funds, access to counterparty information, or access to competitively priced credit. Lower levels of liquidity in a specific currency require market participants to commit less capital to materially move markets. In some cases, the use of indicative price fixings at bespoke times of the day have introduced a moral hazard associated with the ability of a few market participants to influence prices on a wide range of financial products without the corresponding discipline of having to risk capital when contributing prices to such a price fixings (or the benchmarks that emanate from these contributed prices).

Aware of such market dynamics, many emerging market governments and Central Banks have resorted to draconian currency controls and large scale open market operations to effect aggressive currency sterilization strategies that result in FX rate stability. Such exchange rate stability comes at the expense of long-term FX market liquidity, free flow of capital, and natural growth of international trade and investment. In most cases, the large scale market imbalances these tactics cause are counterproductive to the long term economic health of the nations that impose them. While they are effective short-term measures, if held in place too long they can cause more long term risk to the markets they intend to protect. New technologies and solutions that promote price discovery, transparency of price and price fixings derived from an aggregation of executable liquidity (away from bespoke times of the day) rather than indicative price contributions made by relatively few contributors would benefit emerging markets and many developed markets as well.

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Managing FX Risk

One reason market participants transact in foreign currencies is to manage FX risk exposure. For example, United States residents going to visit a European country have the risk that if the Euro (EUR) appreciates against the USD prior to their departure or during their stay, their trip will be more expensive. United States companies who sell products in foreign currency have the risk that if the value of that foreign currency falls between the time orders are received and payments are received, then foreign currency revenues will be worth less at the time revenues are received. In an extreme example, the USD value of revenues could depreciate an amount greater than the profit margin of the original commercial transaction thereby leaving a US exporter with a financial loss at the end of the transaction solely due to unhedged currency exposure. A United States importer who buys goods priced in foreign currency has the risk that the foreign currency valuation will appreciate in terms of USD by the time foreign currency payments are owed resulting in a higher cost for those products than budgeted.

To mitigate this risk, FX market participants have a number of options including market transactions in the FX spot, forward and/or futures markets, as well as natural hedges, such as the use of foreign currency debt and cash management.. For example, in an OTC FX market transaction, the FX risk manager will sell their home country currency and buy the foreign currency (or vice versa as the case may be) by entering into a bilateral OTC FX transaction at a set price and a set delivery date to correspond with the date when foreign currency denominated funds are required for payment. The same FX risk management objective could be achieved in the creation of a natural hedge whereby an FX transaction occurs in the spot market with foreign currency proceeds held in a foreign currency denominated cash equivalent or money market security until such time as monies are owed in the foreign currency. This strategy provides an advantage to the FX hedger who possesses liquid assets denominated in their home currency as it allows them to transact their currency conversion in the most liquid and cost efficient FX market, the spot FX market. It is also the easiest and most cost efficient way to unwind or reverse a hedge position before settlement date as the same reversal can take place in the spot FX market.

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Natural hedges normally lose their cost efficiency when monies are invested into currencies with less liquid and smaller cash equivalents or money markets. Unless the underlying cash equivalent security is more cost efficient to buy and sell (spread) than the imbedded spread on the Forward OTC FX contract, the natural hedge will lose its cost of execution advantage. A lack of Forward FX Benchmarks (or implied forward point schedule derived from an efficient FX benchmark rate) and lack of data concerning opaque spreads and cost of execution in international OTC money markets and Eurobond markets makes this cost comparison difficult to calculate with certainty.

Experienced traders know that secondary markets for traditional cash equivalent, foreign currency denominated money markets (such as international corporate paper, international sovereign T-Bills and Eurobond FRNs,) can be very illiquid and that in most jurisdictions, non-resident investors have no access to primary market security issuance due to local securities laws and regulations. This makes international money markets expensive to non-resident investors who wish to have a cash equivalent store of capital denominated in foreign currencies.

Experienced FX traders also are aware that imbedded spreads tend to increase in forward FX markets the longer the tenure to settlement date. This is due to their customized terms and the nature of bi-lateral counterparty negotiated price structures. If a local currency cash equivalent market is efficient and accessible, a natural hedge will typically be preferred for the FX risk manager who has a liquid store of cash to meet future obligations or who has credit to secure a debt or repo contract with a counterparty on the efficiently priced cash equivalent asset.

In the case of a forward FX transaction, OTC FX hedgers will select a custom settlement date more than two days into the future. This is called a “Forward Hedge” and is transacted by way of a bilateral forward contract between a single counterparty and the hedger. A Forward Hedge has the advantage of requiring little or no capital to establish (although it does require credit which may cause need for the collateralization of assets).

The degree to which collateral or assets may be required to secure a forward FX contract is currently a topic of focus for global regulators in the wake of the credit crisis of 2007-08. There has been much discussion in regards to regulating the requirement to post collateral for

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such contracts to help reduce global systemic risk. Legislative provisions in 2010 United States Dodd–Frank Wall Street Reform and Consumer Protection Act have provided for the likelihood of future regulation in this regard. The disadvantage that this type of FX hedge presents to the FX hedger is that OTC FX forward transaction prices (“Forward Points”) are even more opaque than OTC FX spot transactions. These hedges are also far less liquid, making these transactions more expensive to participants who may need to alter their hedges and reverse forward transactions prior to settlement date.

A more transparent forward marketplace is the exchange-traded, central-cleared model used for FX futures. Several futures exchanges offer the ability to hedge or transact foreign exchange by way of a standardized futures contract. With standardized settlement dates and contract sizes, this market has enjoyed rapid growth in volume, but many of its contract specifications are hindered by legacy issues that are becoming more apparent as the global FX marketplace micro-structure evolves, leaving room for new innovation to capture market share. Certain of these legacy issues result from contracts and trading rules that did not contemplate the evolution of electronic markets and cannot accommodate the size, speed and requirements of the modern global FX marketplace. This suggests that new futures market participants would stand to benefit from futures contracts that reference third party calculated and verified executable spot FX benchmark rates, rather than the formulas commonly used today in FX futures contract settlement specifications.

Fund managers and companies who own foreign assets are also regularly exposed to changes in currency exchange rates. For example, a mutual fund manager who purchases foreign securities in a foreign currency for a mutual fund that is traded in a home currency must take into account fluctuations in currency exchange rates in managing the assets of the mutual fund. Fund managers must take into consideration three exposures to foreign exchange rates: one at the time of purchase of the foreign security; another while the fund manager holds the foreign security for the benefit of their domestic fund holders; and a third at the time the security is sold and proceeds of the sale are repatriated back to original home currency. Fund managers will often hedge foreign currency positions with forward FX contracts, although this practice can be very

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expensive given the propensity for fund managers to make real-time decisions with respect to country exposure thereby forcing them to reverse hedges into opaque, illiquid markets. In some cases, the counterparty with whom they have entered into the forward FX contract provides the only liquidity to reverse the same FX forward contract with no opportunity for multi-lateral price discovery or competition.

These exposures can cause material fluctuations to the returns of the domestic fund, erode investor returns, and ultimately pose a significant challenge to the domestic fund manager in terms of how to manage risk and how to do so at the lowest possible cost. Ironically, many fund managers are not aware of the degree to which their alpha is eroded by inefficient FX transaction execution. Increasingly, portfolio managers and fiduciaries are becoming aware of this fact and are looking for solutions to both analyze and reduce their FX transaction costs. There is also an increasing awareness that protections afforded in regulated markets such as best execution, confidentiality of client activity and front running of customer orders do not extend to unregulated marketplaces. Solutions that can provide OTC FX transactions with features similar to those enjoyed in regulated markets would be of high utility to this market segment.

Investors in global funds with foreign currency exposure have a difficult task when assessing the skill of the investment manager to earn returns according to the fund's investment mandate (which may not include currency exposure management). They must find a way to identify and separate returns derived from currency fluctuations from returns derived from the investment decisions of the portfolio manager which follow an investment mandate. A more reliable, real-time FX benchmark index would be a useful tool in this regard. This benchmark and variations of Intelligent FX Indices would also be helpful to separate FX risk from manager performance for an enhanced, active approach to FX risk management.

OTC FX Settlement Systems

In the current OTC FX marketplace, there are limited choices for how OTC FX contracts settle. All contracts must be settled physically or through bi-lateral netting settlement facilities such as CLS Bank. The vast majority of global OTC FX market transactions entered into on a daily basis are not entered into for purposes of physical delivery of FX but rather for the purpose

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of price discovery and providing liquidity. These transactions are normally entered into between counterparties transacting in the spot FX marketplace and are offset prior to delivery dates. The process of offsetting such transactions eliminates the exposure of one counterparty to another but does not eliminate the need for the contracts to be settled via the traditional forms of OTC FX settlement. The large volume of OTC FX trades that are transacted daily can create systemic risk in the OTC FX market. While existing mechanisms have performed exceedingly well during past periods of market liquidity constraints, volume growth is creating concentration risk around certain settlement venues and further innovation to diversify and reduce this risk will be of long term value to the global FX marketplace and the overall global financial system

Reducing potential systemic risk arising from the settlement of FX trades has been a stated goal of the G10 nations' Central Banks and of the Bank for International Settlements ("BIS") Committee on Payment and Settlement Systems since 1996. Reducing systemic risk has received heightened attention in recent years as the world's Central Banks have searched for ways to reduce risk in the settlement of OTC FX. Details of this mandate are represented in the BIS Committee on Payments and Settlement Systems' report, "Progress in reducing foreign exchange risk" (May 2008).

FX Market Innovation - ETPs

An example of how global currency markets can innovate beyond fundamental structural issues is the development of new, currency based Exchange Traded Products ("ETPs"). One type of ETP is the Exchange Trade Fund ("ETF") that offers public investors an undivided interest in a pool of securities or other assets and thus is similar in many ways to a traditional mutual fund, except that shares in an ETF can be bought and sold throughout the day like stocks on a securities exchange through a broker-dealer. Unlike traditional mutual funds, traders and investors participating in a secondary market can buy and sell ETFs without having to redeem their individual shares at Net Asset Value ("NAV"). Instead, financial institutions or other qualified investors purchase and redeem ETF shares directly through the ETF fund manager in

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the primary market, but only in large blocks. In the case of currency ETFs, financial institutions or other qualified investors convert currency holdings to shares that trade on a public exchange. An advantage for market participants transacting on an exchange is the equal access to credit via the central clearing mechanism of an exchange and a common, regulated rule set under which all market participants agree to transact.

In 2005, Rydex Investments launched the first ever currency ETF called the Euro Currency Trust (NYSE: FXE) on the New York Stock Exchange. Since then Rydex has launched a series of funds tracking seven major currencies, one Advanced Emerging Market currency and one Secondary Emerging Market currency under their brand “CurrencyShares.” In 2008, Deutsche Bank’s “db x-trackers” launched the Sterling Money Market ETF (LSE: XGBP) and USD Money Market ETF (LSE: XUSD) on the London Stock Exchange (“LSE”). Since then there have been other currency ETFs listed in various local markets around the world. At the beginning of 2011, the total assets under management in currency ETFs worldwide was estimated to be approximately \$7.2 billion USD according to data gathered from Bloomberg LP.

Unlike holding a spot OTC FX position past initial value date, a currency ETF does not require an investor to roll transactions to maintain currency positions. However, existing currency ETFs have disadvantages inherent that prevent them from being a fungible instrument to OTC FX. Existing currency ETFs do not trade with the same 24 hour day trading cycle of the FX markets and therefore experience no secondary market liquidity when equity markets are closed. Most existing currency ETFs hold cash deposits or short term bonds denominated in foreign currencies. Cash deposits and short term bonds are not fungible to the global OTC FX market where currency exchange rates are price discovered. Existing currency ETFs also have primary market trade settlement periods which are not consistent with the FX Interbank market time conventions. For this reason, they may have a price that tracks the movement of currency but cannot be considered fungible with spot FX contracts or forward contracts. Their lack of fungibility means they suffer from far less volume, less institutional participation in trading, and less efficiency with respect to price discovery, leaving them with a greater risk of foreign currency price tracking error.

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Problematically, many currency ETF management and expense fees (TER) have exceeded interest earned in their funds leading to foreign currency price tracking error. Similar to the condition when a domestic money market fund fails to preserve capital (a condition referred to as "Breaking the Buck"), so have these currency ETFs failed to preserve capital when their share price, less dividends paid, is measured in the base currency in which they are mandated to track. Inherently, the flaws in existing currency ETFs have rendered them a less efficient vehicle to trade currencies or baskets of currencies than might be possible with modifications to their structures and primary market rules sets.

Existing currency ETFs also have disadvantages in the way that interest is paid. With the most popular currency ETFs, interest is earned in a reference currency and then converted into the base currency at some opaque rate close in time to the date on which dividends are paid (typically monthly) and then distributed to shareholders, exposing currency ETF investors to additional foreign currency exposure on accrued interest.

Despite structural flaws with legacy products, the currency ETF market has grown in popularity since its inception, and there is strong market evidence of global market demand for a regulated, exchange-traded vehicle that can provide a store of capital for FX cash equivalent investment mandates that also has an efficient FX conversion mechanism built into its structure. Cürex Group has developed intellectual property that addresses the flaws in current currency ETF structure, including proprietary technology which can be used to correct these flaws to the benefit of traders and investors.

Exchange Traded Notes ("ETNs") are another example of ETPs that have been developed to track the relative value of currencies. Currency ETNs are debt securities backed by an issuer that are designed to provide investors access to returns of various FX benchmarks. Though linked to the performance of a market benchmark, ETNs are not equities nor are they index funds, but they do share several characteristics. Similar to equities, they are traded on an exchange and can be traded short. Similar to an index fund, they are linked to the return of a benchmark index. But as debt securities, ETNs do not actually own anything they are tracking: they are debt instruments.

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There are currency ETNs that have been developed to attempt to provide investors with returns of certain currency benchmarks. However, currency ETNs are subject to risk of default by the issuing bank or issuer as counterparty to the debt instrument. This fact proved to be a problematic for some currency ETNs during the credit crisis of 2007-08. Currency ETNs also share many of the same disadvantages of currency ETFs, including: (i) currency ETNs have disadvantages in the way that interest is paid and the way it is accrued in the price of the ETN, making it difficult for the trader to accurately track the value of underlying assets; (ii) currency ETNs are more difficult to redeem at a market price discovered valuation (they can be redeemed only in the primary market for cash based on prices provided by a single counterparty rather than a price discovered in the global OTC FX markets); and (iii) currency ETNs are not fungible with FX spot and forward transactions.

Apart from concentrated counterparty risk, the fundamental problem with existing currency ETNs lies with the indices they track. An ETN is redeemable in the primary market for an amount equal to an index – making the ETN very accurate at tracking the index, however, the index is likely an indicative value rather than a value derived from an executable pool of liquidity price discovered away from the ETN's primary market participants. The use of an indicative value index instead of an OTC FX price discovered index makes it more difficult, more costly or structurally impossible for a market participant to arbitrage such an ETN's secondary market price to the actual underlying OTC FX spot market. If there is no confidence on the part of the arbitrageur that the index being tracked is an executable price for the pair or basket of currencies being tracked or that the price that is reflective of an aggregated market at the moment a redemption order is submitted, there can be no confidence that an apparent arbitrage in price data can actually be monetized.

Despite structural flaws in legacy products that prohibit asset growth and wider use of these products, the currency ETN market has continued to grow since their inception. For example, ETF Securities has listed a family of 96 currency ETNs on the LSE since October 2009. Cürex Group has developed and owns separate, proprietary intellectual property that addresses the flaws in legacy currency ETN structures as well as proprietary technology which

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can be used to correct these flaws to the benefit of traders, investors and product sponsors who may issue these types instruments.

Other Foreign Currency ‘Store of Capital’ Markets

Non-USD denominated money market funds represent another security that market participants can use as a store of capital that accurately track the value of local currencies and can be used as a natural currency hedge. At the end of Q2 2010, the total assets under management in non-USD money market funds was estimated to be the equivalent of approximately \$1.67 trillion USD, according to the Investment Company Institute (ICI) compiled on behalf of the International Investment Funds Association.

Global non-USD bank deposits also represent a significant and important market that both retail and institutions use as a short term, liquid vehicles for local currency savings and natural hedges for future local currency obligations. Proprietary market research conducted with global market leading partners of Cürex Group estimate that non-USD local currency bank deposit market is the equivalent of approximately \$18 trillion USD with approximately \$5 trillion USD of local currency assets that related to non-bank institutional and retail depositors who may find utility in an improved ETP that offers both an efficient FX transaction and local currency store of capital solution.

Institutions will also use repurchase and reverse repurchase agreements (‘Repos’) as a short term store of capital. Repos are established with bilateral OTC agreements between counterparties using liquid, yield generating instruments such as sovereign bonds, high rated corporate paper and Bankers Acceptance notes. International currency denominated Repo transactions are often used by institutions as natural hedges (either as short-term foreign currency assets or liabilities). The outstanding notional European non-USD repo market was estimated to be the equivalent of approximately \$6.5 trillion USD in June 2010 according to the International Capital Markets Association’s semi-annual ICMA European repo market survey (June 2010).

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The Next Generation of Currency ETPs

The next generation of currency ETPs will not be known as currency ETPs. New technologies make it both feasible and economically preferable to harness currency exposure within the traditional portfolio construct so as to alter and manage currency exposure to both manage risk and enhance portfolio returns. The complexities associated with the interbank clearing, credit and managing open OTC spot FX positions make this next generation of investment products ideal for the ETP structure. The next generation of currency centric ETPs will be embedded with traditional equity, fixed income and commodity offerings creating an entirely new generation of ETPs.

Successful ETPs have always been built on the principle that the ETP delivers transactional efficiency over the underlying market which it seeks to track. The costs and specialized knowledge required to efficiently deploy and maintain an FX hedge in the OTC market without material tracking error suggest that a single point of execution that combines underlying assets, such as bonds, stock or commodities, with the efficient execution of deliberately chosen open spot FX positions could deliver both transactional efficiencies as well as enhance diversification and portfolio yield to investors of ETPs.

With the new technologies and methods outlined earlier in this paper, the marketplace now has the ability to reference transparent, market tested OTC FX rates for both end-of-day and real-time, intraday valuation of ETPs that produce both passive and actively managed exposure to a wide range of currency markets and deliver new sources of diversification, yield and risk management. Specifically, now a market participant can invest in a domestic market while hedging away local market currency risk.

In addition, a market participant can now invest in foreign markets and alter residual country currency exposure gained with a passive or active managed basket of currency exposures. In this example, an investor could be long a basket of UK stocks (i.e. FTSE 100) while being short GBP and simultaneously long the exposure of eight countries, which are selected based on a wholly separate criteria than what was used to select the underlying securities.

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Alternatively, the same approach could be taken to a single stock allocation. For instance, a share in Toyota Motor Corporation could be bought via a new ETP that is also short Yen, and long a basket of 20 country currencies – allowing the investor to allocate capital to Toyota Motor Corporation without regard to a depreciating Yen.

Such ETPs will enable a domestic investor in a country with an appreciating currency to reap the benefits of international asset allocation without concern for the specific relationship between their home currency and the target country currency. This approach allows the concept of “hedge” to be expanded to a global basis. In essence, an investment strategy can become “currency neutral” allowing the investor to focus on the fundamentals of the investment rather than the relative currency exposure.

New technologies that enable spot FX to generate ongoing returns in the ETP construct will also introduce a new source of liquidity into global ETP markets. Now OTC FX market makers, responsible for over \$1.5 trillion of daily trading volume, can link their liquidity to exchanges and OTC markets previously inaccessible due to technology, credit and product structure limitations. The porting of liquidity from highly liquid OTC FX markets to regulated exchange environments holds great promise in an era where constraints on capital and new regulation are challenging traditional market makers to maintain current liquidity obligations. In such an environment, markets will need to actively seek and embrace technologies and product solutions that can port liquidity across global capital markets or risk significantly reduced volumes and heightened market volatility. Cürex Group has developed and owns the intellectual property that provides market makers with the ability to port liquidity between traditionally separate asset classes. Early adapters of such technologies could fundamentally drop silos that have kept capital from efficiently finding investment opportunity in both developed and developing markets; a vital function of the global capital markets.

With new technologies like those developed by Cürex Group now available to provide turn-key FX exposure risk management and new sources of transparent price information via the collection of executable, market tested FX fix rate data, the market has new tools to create solutions that benefit efficient portfolio construction and global capital allocation.

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With new resources, there is a corresponding opportunity to expand academic research into the study of separating residual currency exposure from underlying investments and replacing local currency exposure with new currency profiles to determine if current boundaries of portfolio efficient frontiers can be expanded. This new and exciting field of portfolio analytics offers the potential for more efficiently constructed portfolios and the writing of new chapters in our understanding of efficient portfolio construction. As research is published and portfolio strategies evolve accordingly, we are likely to see the emergence of new ETPs globally embracing this methodology. In short, the next generation of currency ETPs is likely to form the foundation for the next generation of global ETPs with exposures reflecting all asset classes.

Conclusion

Rather than one centralized regulated marketplace, the global OTC FX market consists of many fragmented, unregulated, over-the-counter pools of liquidity. These liquidity pools can range from opaque or private bi-lateral liquidity provisions to multi-contributor pools of liquidity where providers are competing for order flow from liquidity takers in an electronic order matching network. Such markets may be transparent to all those approved to transact in a specific liquidity pool but not to others outside of that liquidity pool. Not all market participants in global OTC FX markets are eligible to join and transact in the same liquidity pools. Those market participants who can trade may not know if their access to liquidity within these pools has been altered, since liquidity pools on electronic platforms are managed with a great deal of opacity and rules of execution that may differ among participants. The fragmented nature of the global OTC FX marketplace means it is possible for a single currency pair to trade at different prices, in different markets at the same time and not all market participants can gain access to the best price. The concept of “Best Execution”, as it is known in regulated markets, does not currently exist in OTC FX.

It is desirable for the purpose of price transparency, liquidity and market confidence, as well as principles of fair trade, market access and best execution, to provide methods and systems to attract traders to regulated markets for the purpose of transparent price discovery in

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fungible FX products. It is also desirable to create methods and systems that attract new sources of liquidity to the global OTC FX marketplace, especially for currency pairs that do not enjoy the liquidity that exists in major currency pairs such as that of the USD, EUR, and JPY.

Correcting structural flaws in existing ETPs with an improved FX ETF or ETP structure, as delivered by Cürex Group's intellectual property and proprietary technology, creates an important new choice for market participants who wish to transact in FX and in international currency denominated cash equivalent money markets. This choice provides reduced friction for participants who otherwise must deal with the costs and complexities of opening accounts, moving capital across borders and trading securities in countries where counterparty risk may be more difficult to ascertain and where principal market participation may be restricted by local securities regulations.

Accordingly, there is a benefit in providing methods and systems that enable investors to maintain currency exposure in investments that, for example, (i) do not require investors to effectuate roll transactions, (ii) trade on the 24 hour day trading cycle of the FX markets, (iii) are structured and traded so that they more closely priced to track spot transactions in a given currency pair, (iv) are easier to redeem in a manner consistent with the inter-bank convention so that FX traders or investors may consider their value to be fungible for a spot FX contract, and (v) can be transacted in existing, regulated broker dealer accounts rather than at accounts of single counterparties where collateral posted can be exposed to single counterparty default risk.

Such a security that exhibits fungibility, in part, to a spot FX contract should attract greater institutional participation than existing currency ETFs and guarantee greater secondary and primary market volume, leading to more effective price discovery. If a new marketplace for improved currency ETFs were created with these characteristics, it is conceivable that a primary price discovery center for FX could be formed on a secondary market equity exchange creating a unique set of data that could offer the global markets more transparency to global FX markets.

In part, this data phenomenon could emerge as a byproduct of the natural profit incentive of price discovery arbitrage with fragmented OTC FX liquidity pools. This could create new commercial benefits for participants in both primary and secondary securities markets as well as

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governments who issue such currency and wish to have orderly, liquid, transparent, and accessible markets in their base currency unit.

It would also be desirable to have a discernible FX benchmark index that is transparent in price and time, deriving its price data from FX liquidity pools which are executable and which stream real time prices during market hours by counterparties authorized to transact with a common transparent set of rules and access to credit. Such a benchmark FX rate would provide the market with a new tool for the global capital markets, providing a transparent look at the price level where FX can be and is being transacted, allowing market participants to compare trades executed in fragmented liquidity pools or with single counterparties.

Cürex Group has developed intellectual property that enables transparent, executable FX indices based on a clear, exchange-like rule set and audited by a recognized global financial data company. The data collection, calculation methodology, data publication and application of data publication is available to relevant user groups in the global capital markets. The intellectual property described herein has been used to develop proprietary order matching and data management technologies and is being used to co-develop financial products for the global marketplace. Cürex Group's intellectual property has enabled the emergence of new benchmark FX fixing rates for pairs, indices for baskets of currencies, and indices for interest rates derived from both the spot and forward FX markets. These new benchmark fixing rates can be either exclusive or inclusive of yield. Cürex's intellectual property is fostering the development of a family of unique intelligent indices, built from these underlying benchmark fixing rates, basket and rate indices, which also can be exclusive or inclusive of yield.

With the introduction of new integrated technologies and financial products that link the global OTC FX and exchange-traded marketplaces, Cürex Group anticipates the emergence of an unprecedented FX price discovery market with common access and regulated trading rules for its participants. Cürex also anticipates a new generation of ETPs that benefit from new sources of liquidity and new investment strategies enabled by these new capabilities. These new products will transpose the rights, responsibilities and protections afforded through the world's regulated exchanges to FX market participants who today do not have the ability to transact in this manner.

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Data emanating from both OTC and public exchange venues linked to this financial marketplace will be important to all global market participants. Distinct Cüreex FX index data products are designed to provide ETP and hard currency delivery benchmarks as well as separate FX pair and basket valuation benchmarks which can exceed standards of benchmarks fiduciaries currently employ to measure the value of currency in existing financial products, risk analytics and transaction cost analysis. Recent market developments have raised the prominence of these issues for fiduciaries and market liquidity providers alike, giving rise to an acute need for new market based solutions. Cüreex Group is uniquely positioned with its partners to deliver new, innovative and valuable tools to meet the demand of a rapidly growing global marketplace and the needs of a diverse group of investors.

¹ P&I, Towers Watson

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