



FIS MARKETMAP – TTMZERO CONTENT

Real-time Data Analytics for Better Investment Decisions



CONTENTS

THE COST OF MANAGING RISK

Most asset managers will agree, it takes more than just good information to effectively manage risk. It takes accurate information. Timely information. Real-time information that costs top dollar to acquire and, at current prices, can often cut deeply into your profit margin – especially if you’re involved in analyzing, tracking, trading and reporting across multiple investment types.

The more exchanges, financial instruments and asset classes you trade, the more you pay in licensing fees to access the information you need, and the higher your cost of doing business tends to be. Until now.

FIS MarketMap users now have a distinct operating advantage when it comes to assessing market risk from global exchanges and over-the-counter (OTC) sources, in real time. Because now, MarketMap and TTMzero have combined forces to offer you a real-time data analytics solution, directly within your MarketMap system. In short, MarketMap TTMzero content effectively replaces the multiple index licenses you currently now pay for, with a single, highly accurate, real-time data analytics solution that complements your MarketMap data services bundle.



INTRODUCING REAL-TIME PRICES BY TTMZERO

With FIS MarketMap - TTMzero content, you now have a cost-efficient, evaluated real-time pricing service covering a large number of financial instruments, in a one-stop RegTech and Capital MarketsTech solution.

This Real-time Data Analytics Platform computes evaluated real-time prices for a very large number of financial instruments, including liquid, complex and illiquid instruments which do not have observable market prices. As a result, you can use the data for market price indications on liquid instruments or as a model price for less liquid instruments, covering the full spectrum of:

- | | | | |
|---------------------------|---|---|--------------------------|
| 3,000+
equities | 184+
indices | 27+
futures | 4+
commodities |
| 200+
FX pairs | 200+
OTC derivative
payoff types | 2 million+
bonds and structured
products | |

RUN WITH STATE-OF-THE-ART TECHNOLOGY

TTMzero incorporates proprietary pricing technology with direct access to data feeds from the most relevant trading platforms and market makers.

Supported by a team of experienced financial engineers and software developers, it contains a reference data model which processes millions of pricing computations every second, with algorithms for calculating a wide variety of applied pricing models, including:

- Hull-White
- Libor Market Model
- Jarrow-Yildirim Inflation Model
- SABR
- Heston
- Dupire
- Local Volatility Model
- Multi-Factor Models
- Monte Carlo Simulation
- PDE
- Lattice
- Binomial/Trinomial Trees
- Longstaff-Schwartz



By adding TTMzero content to your FIS MarketMap platform, you effectively gain a game-changing technology that cuts cost, improves margin and reduces risk – an all-in-one powerful decision-support engine.

FIS MarketMap - TTMzero Content Facts

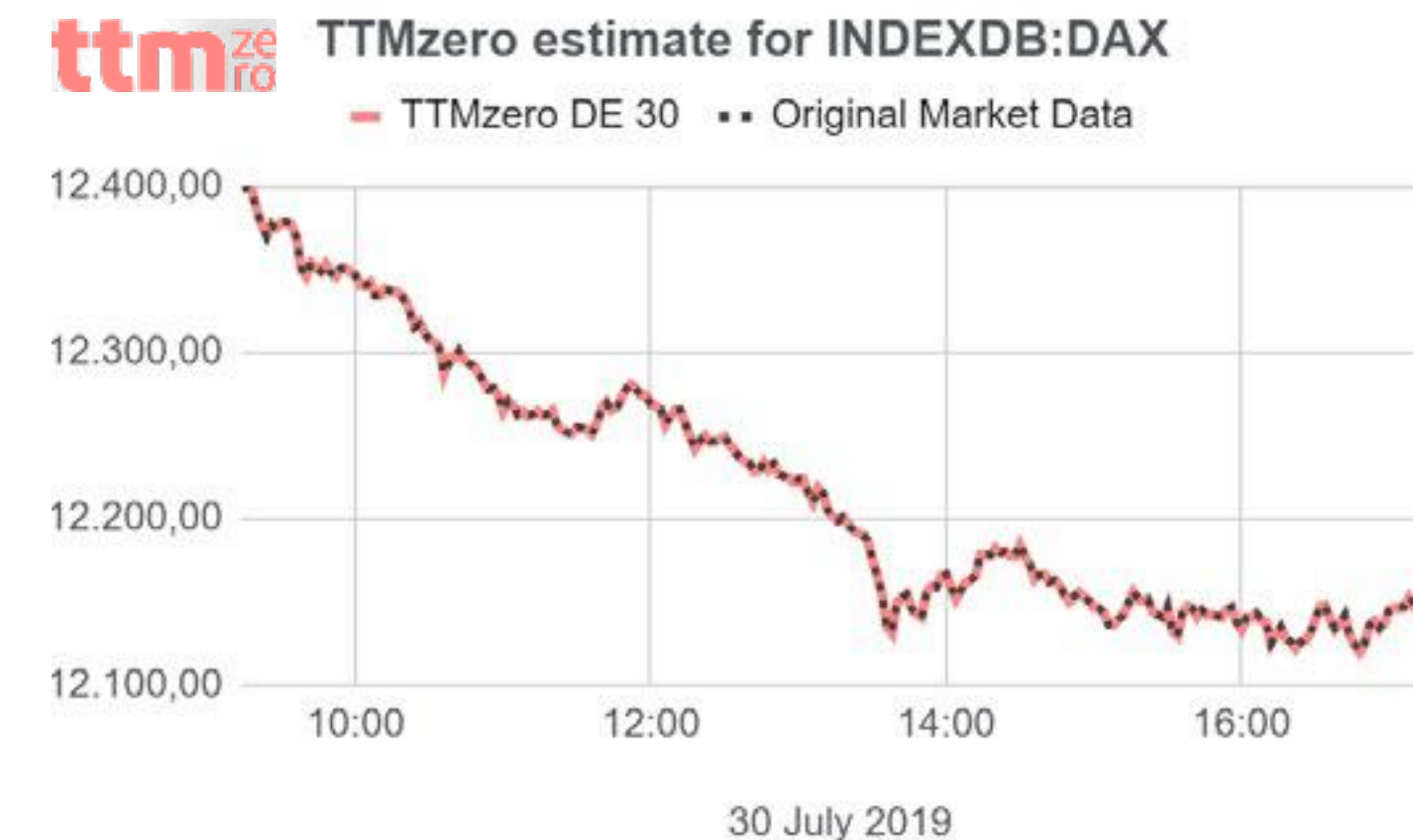
- Evaluated real-time prices calculated up to 10 times per second per instrument
- Input data on pricing models contains quote data on financial instruments from more than 10 investment banks
- 95% of traded OTC volume covered
- Real-time data available from 8:00 a.m. to 10:00 p.m. CET
- U.S. daily market hours covered from 9:30 a.m. to 4:00 p.m. ET
- FIS maintains all necessary cash reserves
- FIS funds all redemptions

HIGHLY ACCURATE, HIGHLY RELIABLE

FIS MarketMap - TTMzero Content ensures a high level of accuracy by continuously storing data on a tick level and comparing it to traded prices and firm quotes in the market. Our financial algorithms are steadily trained to minimize tracking errors between our evaluated real-time prices and realized traded prices in the market.

As a result, the data we deliver is highly accurate and reliable. Check out the charts below to see how close our evaluated real-time prices are to their comparative actual market quotes.

Example of TTMzero Evaluated Real-time Data for Liquid Instruments

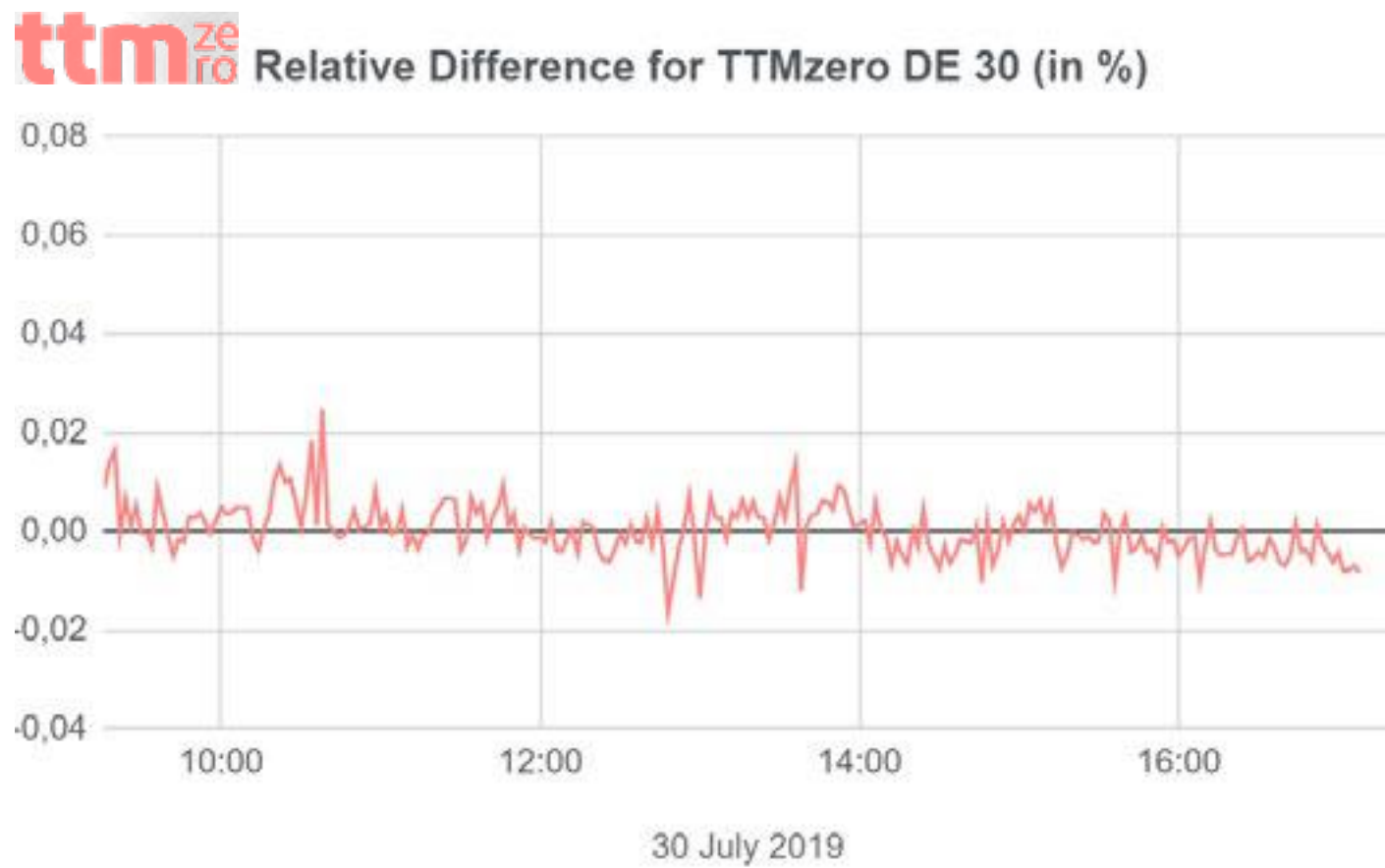
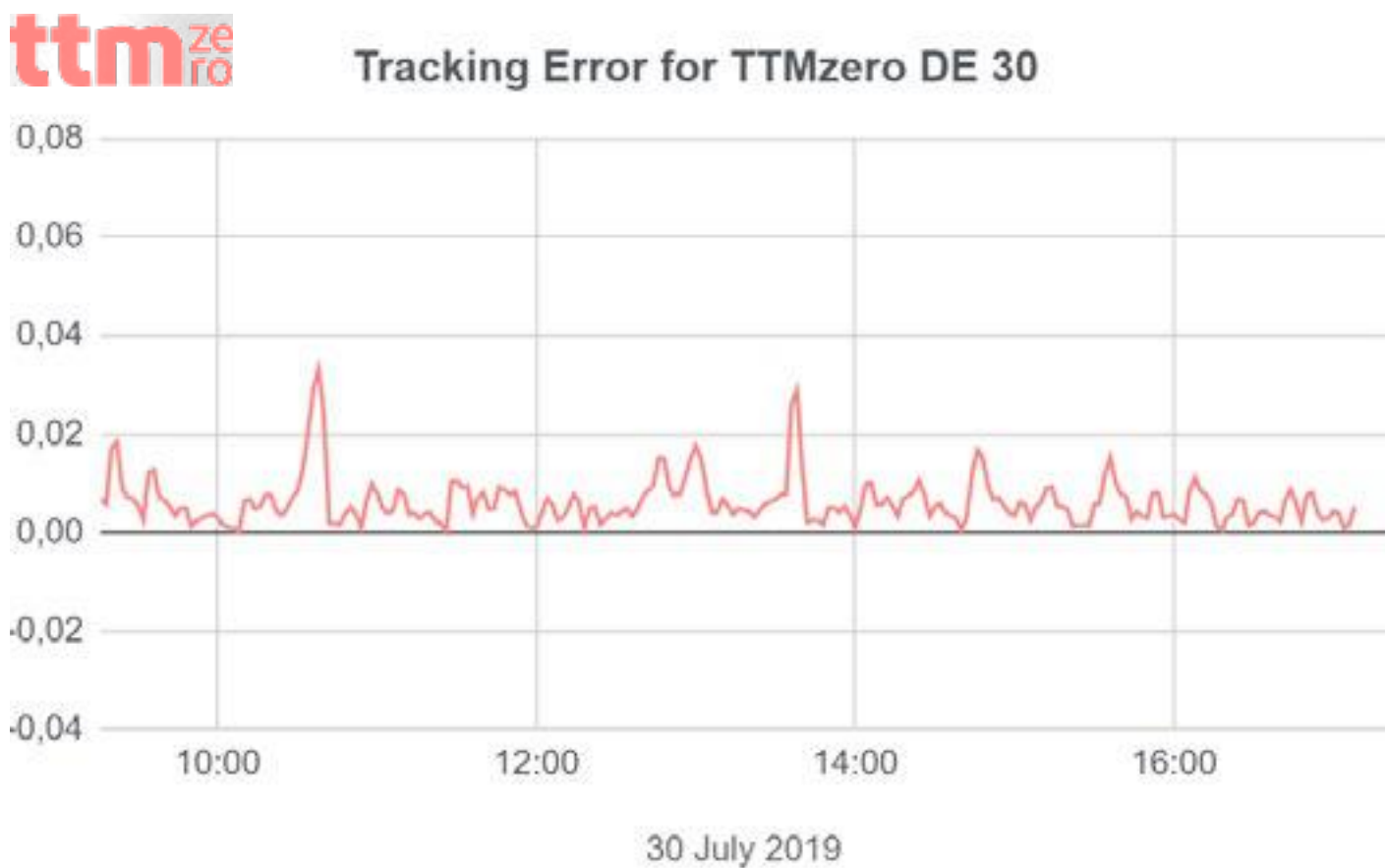


Comparison of tick data for evaluated real-time prices and market quotes on July 30, 2019.

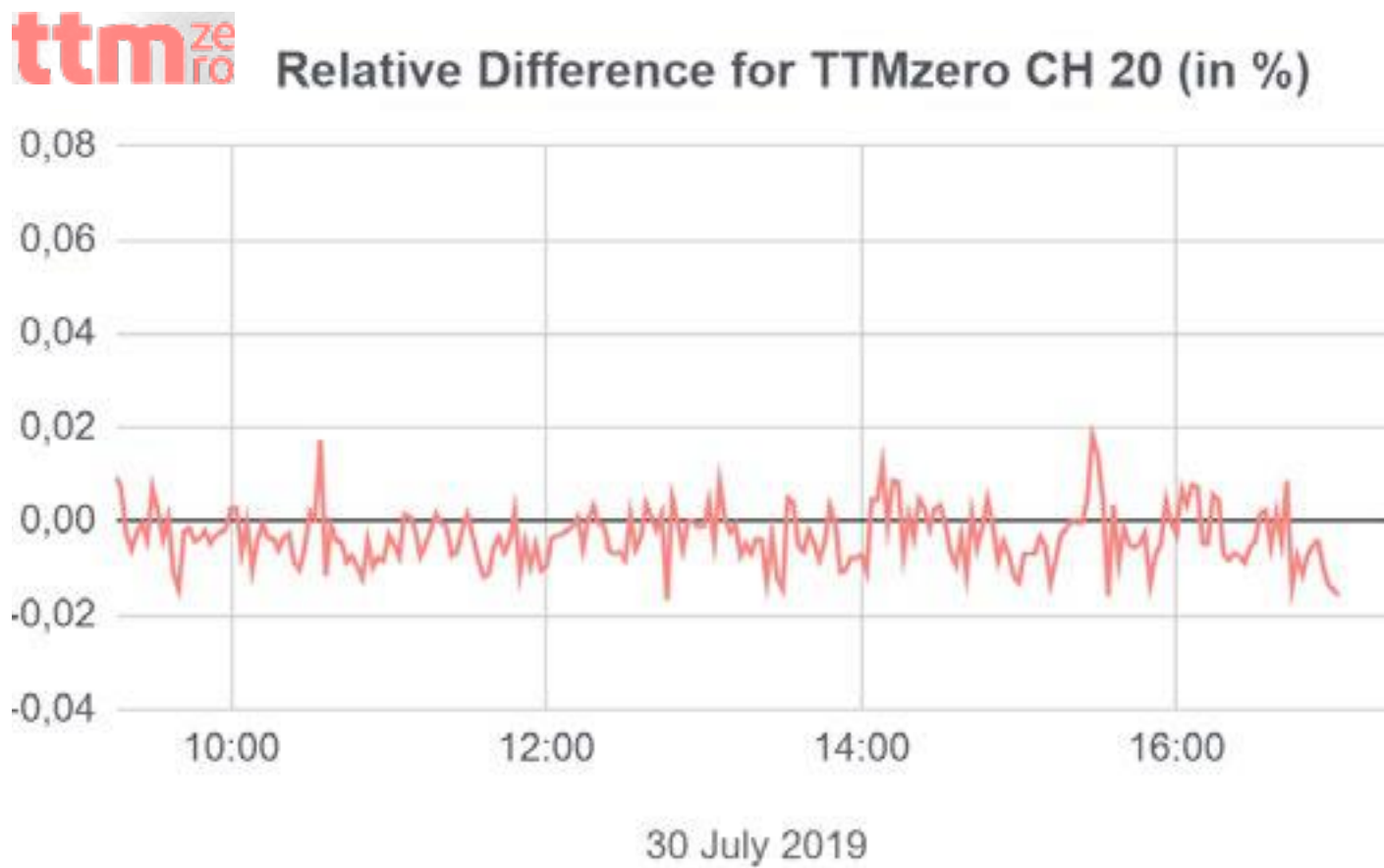
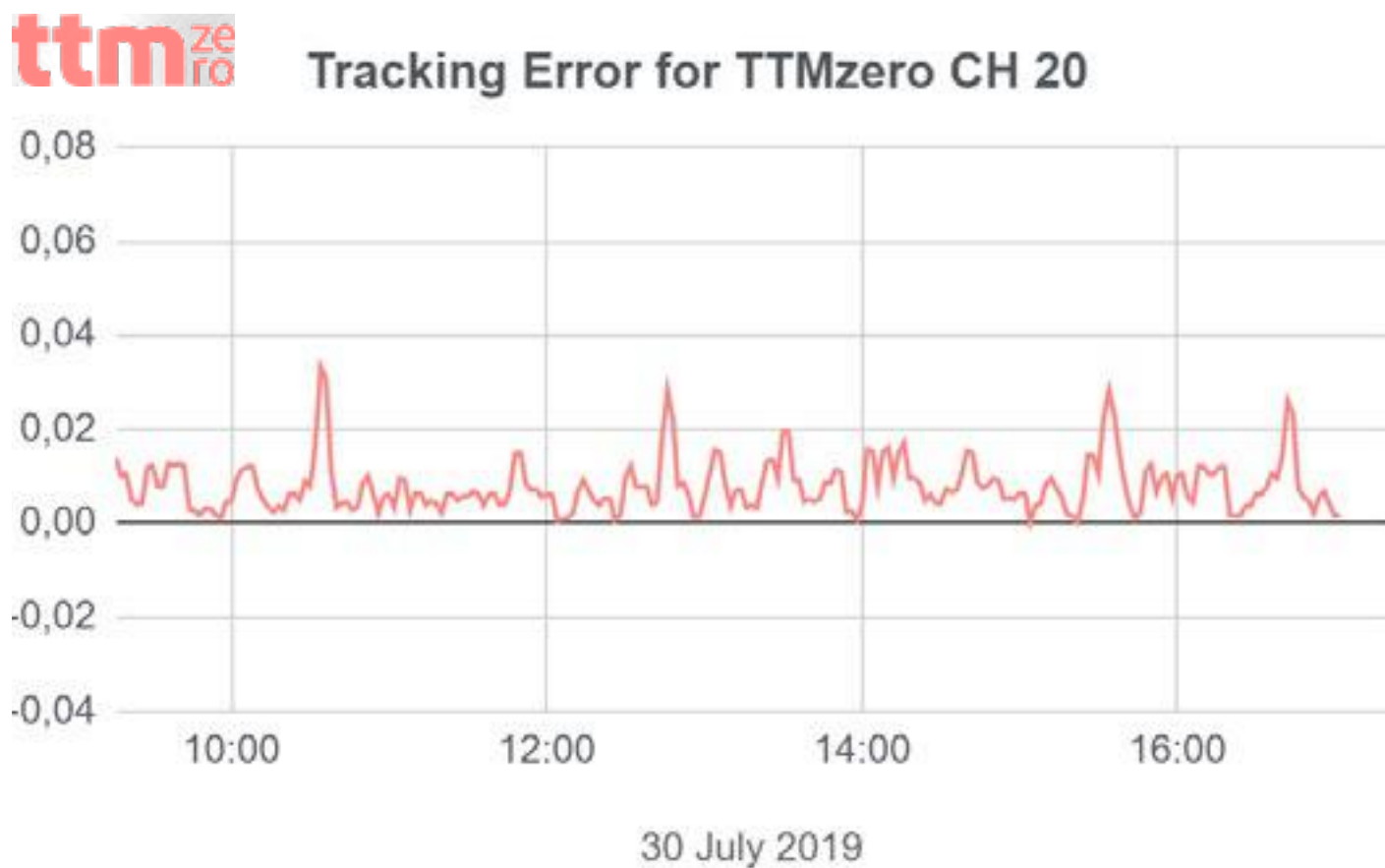
Minimal Relative Difference and Tracking Error

The following charts illustrate the tracking error and relative difference respectively for July 30, 2019, considering one data point every two minutes from 9:00 a.m. CET.

The tracking error for TTMzero DE 30 ranges from 0.0001 to 0.0331, while the relative difference ranges from -0.0163% to 0.0247%.



For the TTMzero CH 20 the tracking error ranges from 0.00009 to 0.033314, while the relative difference ranges from -0.0167% to 0.01820%.



TTMZERO EVALUATED REAL-TIME PRICES IN ACTION

FIS MarketMap - TTMzero evaluated real-time prices can improve your risk and investment decisions in a number of ways.

- **Digitize Market Conformity Checks (MCC)**
MCC is a post-trade process in line with the Minimum Requirements for Risk Management (MaRisk), focusing on finding the fair value of each trade at the time of execution.
- **Support Compliance**
Such as Basel II Prudent Valuation Guidance, requiring market prices or model inputs to be regularly verified for accuracy by independent parties.
- **Inform Customers**
Provide clear, transparent and non-misleading information to customers by displaying data on licensees' websites.

MAKE BETTER DECISIONS WITHOUT PAYING MORE

Break free from high licensing fees and gain access to the information you need to manage investment risk and perform at a higher level. Consider the benefits of FIS MarketMap - TTMzero content:

- **Simplified Data Licensing**

Our proprietary data products are licensed for public display and internal purposes. No more license agreements with third parties needed.

- **Cost Savings**

Cut cost by more than 90 percent compared to purchasing data from various sources.

- **Convenience**

Our IT platform is agile, highly scalable and simple to connect. Exchange of request and response files occurs via API, secure file transfer protocol (SFTP) or Web-Interface, minimizing integration and connection efforts.

- **Accuracy**

Our real-time data is highly reliable and accurate due to trained algorithms and an enhanced input data approach.

- **High quality**

We guarantee high data quality due to continuous review processes and thorough monitoring and documentation.

- **Flexibility**

Use your data in multiple applications, including internal risk management systems, mobile apps and public webpages.

- **Secure Service Delivery**

We guarantee 99.9 percent uptime.

- **Real-time and Historical Data**

Our feed provides real-time and historical time-series data.

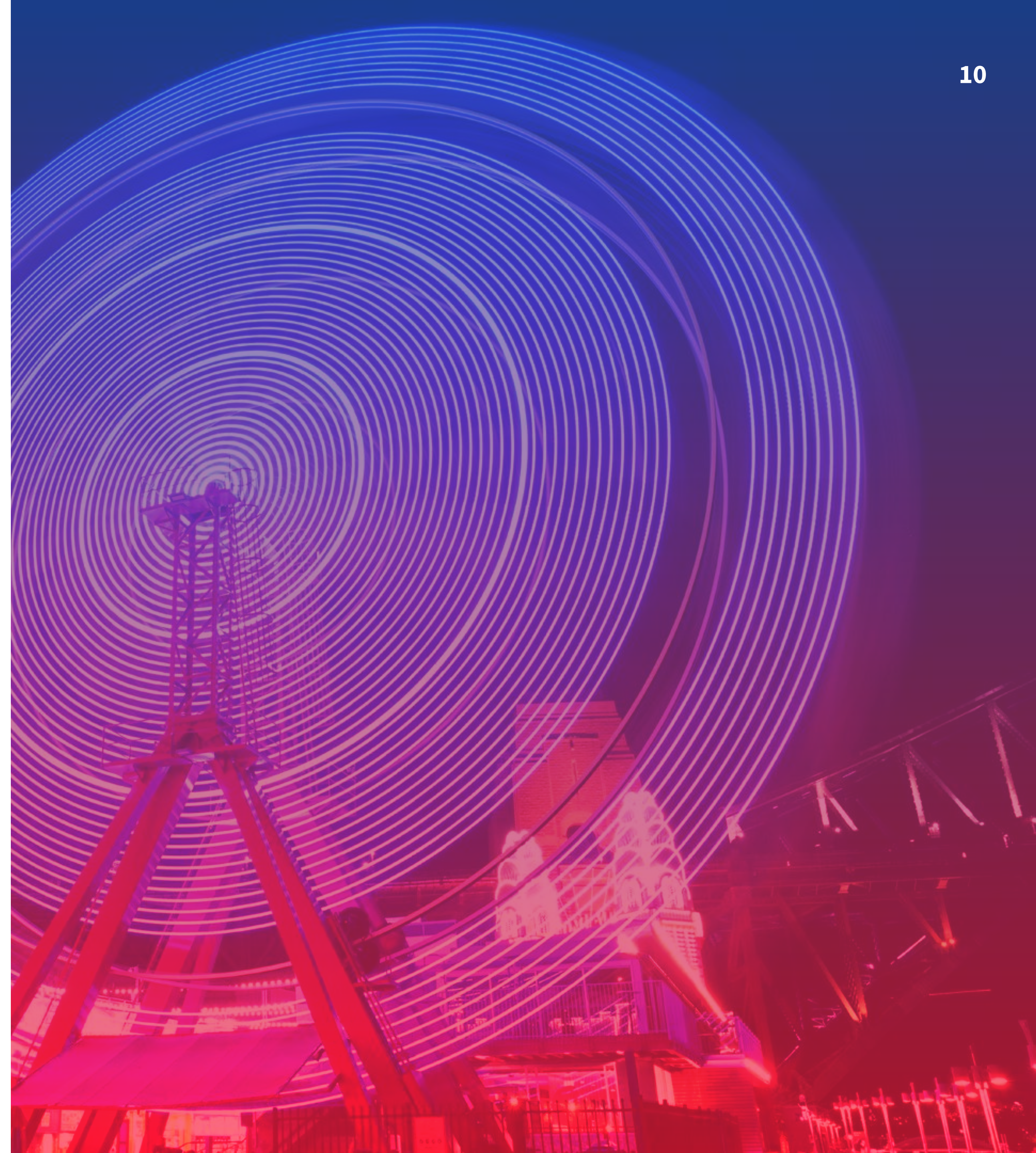
- **Transparency**

We provide full documentation of our evaluated real-time prices for less-liquid instruments, enabling back-office and middle-office functions to easily track changes in valuation parameters over time.

POWER UP FOR SUCCESS WITH FIS MARKETMAP - TTMZERO CONTENT

Whether you are a manufacturer or distributor of investment products, risk controller, asset manager, insurance company, data vendor or online broker, FIS MarketMap - TTMzero real-time pricing services provide the information and calculation tools you need to control cost, reduce risk and make accurate, timely investment decisions.

Start making better decisions – without the steep licensing fees. Look into FIS MarketMap - TTMzero Content. Visit www.fisglobal.com and learn more today.



ABOUT FIS

FIS is a global leader in financial services technology, with a focus on retail and institutional banking, payments, asset and wealth management, risk and compliance, consulting and outsourcing solutions. Through the depth and breadth of our solutions portfolio, global capabilities and domain expertise, FIS serves more than 20,000 clients in over 130 countries. Headquartered in Jacksonville, Florida, FIS employs more than 55,000 people worldwide and holds leadership positions in payment processing, financial software and banking solutions. Providing software, services and outsourcing of the technology that empowers the financial world, FIS is a Fortune 500 company and is a member of Standard & Poor's 500® Index.

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