

Danske Bank
- FX & Exploratory Data Analysis

23/10-19

Introduction

Christoffer Pind

Head of Corporate & Institutional FX Sales

Education:

B.Sc. in Business Admin. & Philosophy, CBS
M.Sc. in Finance, Cass Business School

Experience:

- 2004-2011: VP, Citi Bank
- 2011-2015: Director, UBS
- 2015-: FVP, Danske Bank

Nikolai Staugaard Eriksen

Dealer, Corporate & Institutional FX Sales

Education:

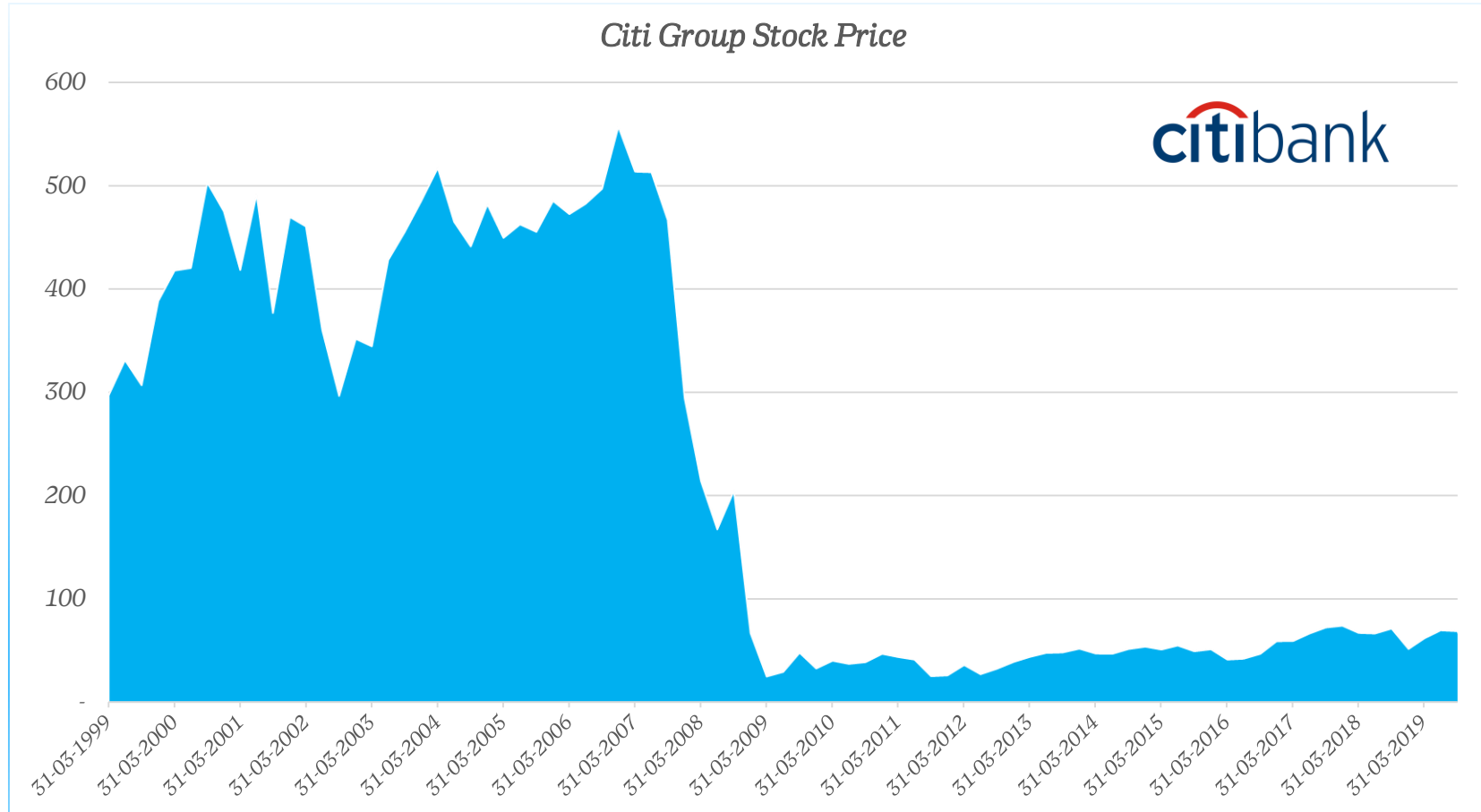
B.Sc. in International Business, CBS
M.Sc. in Applied Economics & Finance, CBS
M.Sc. in Sports Management, Columbia University

Experience:

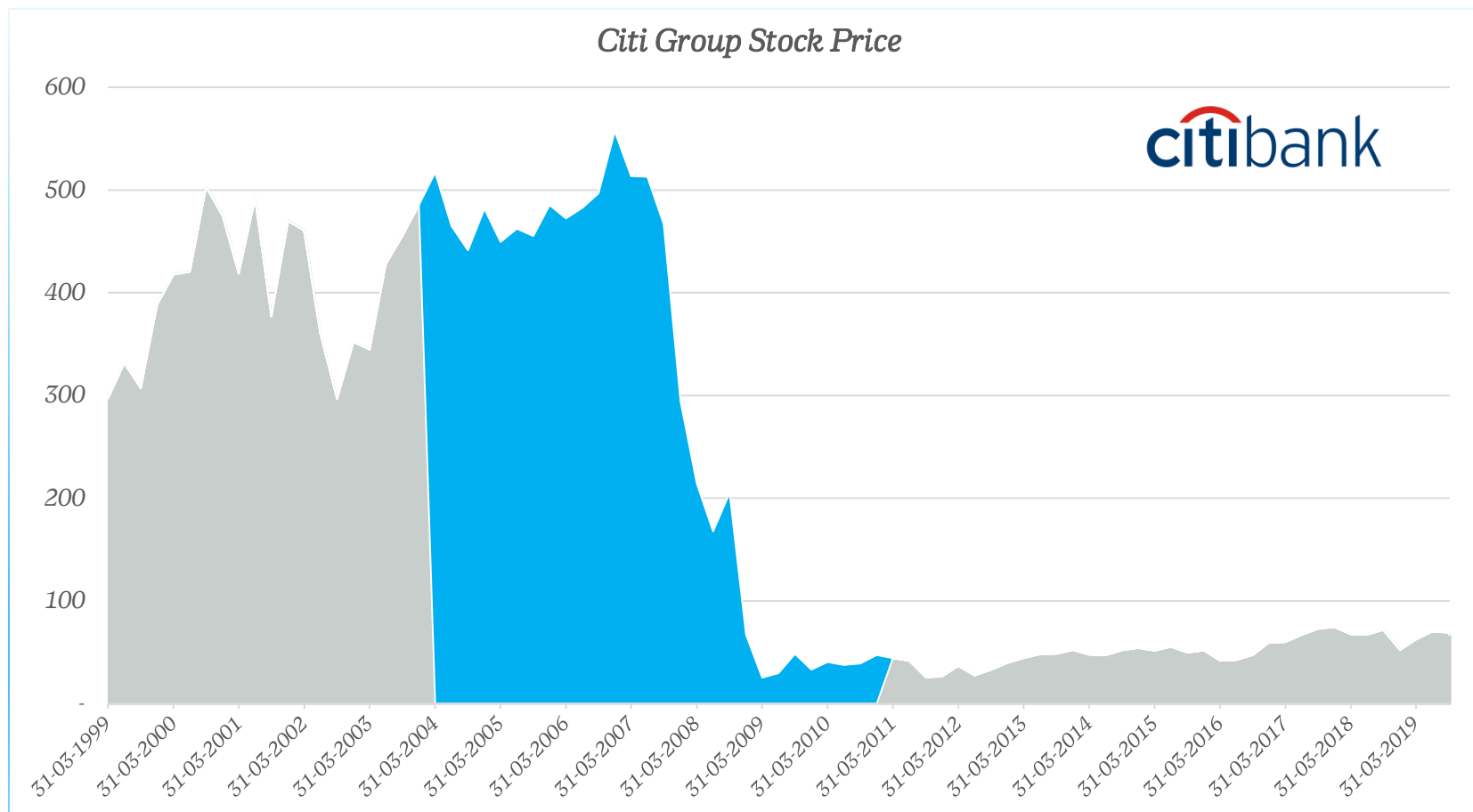
- 2014-15: Student Assistant, Maersk
- 2016: Associate, New York Knicks
- 2017-18: VP, NNDC
- 2018-: Dealer, Danske Bank



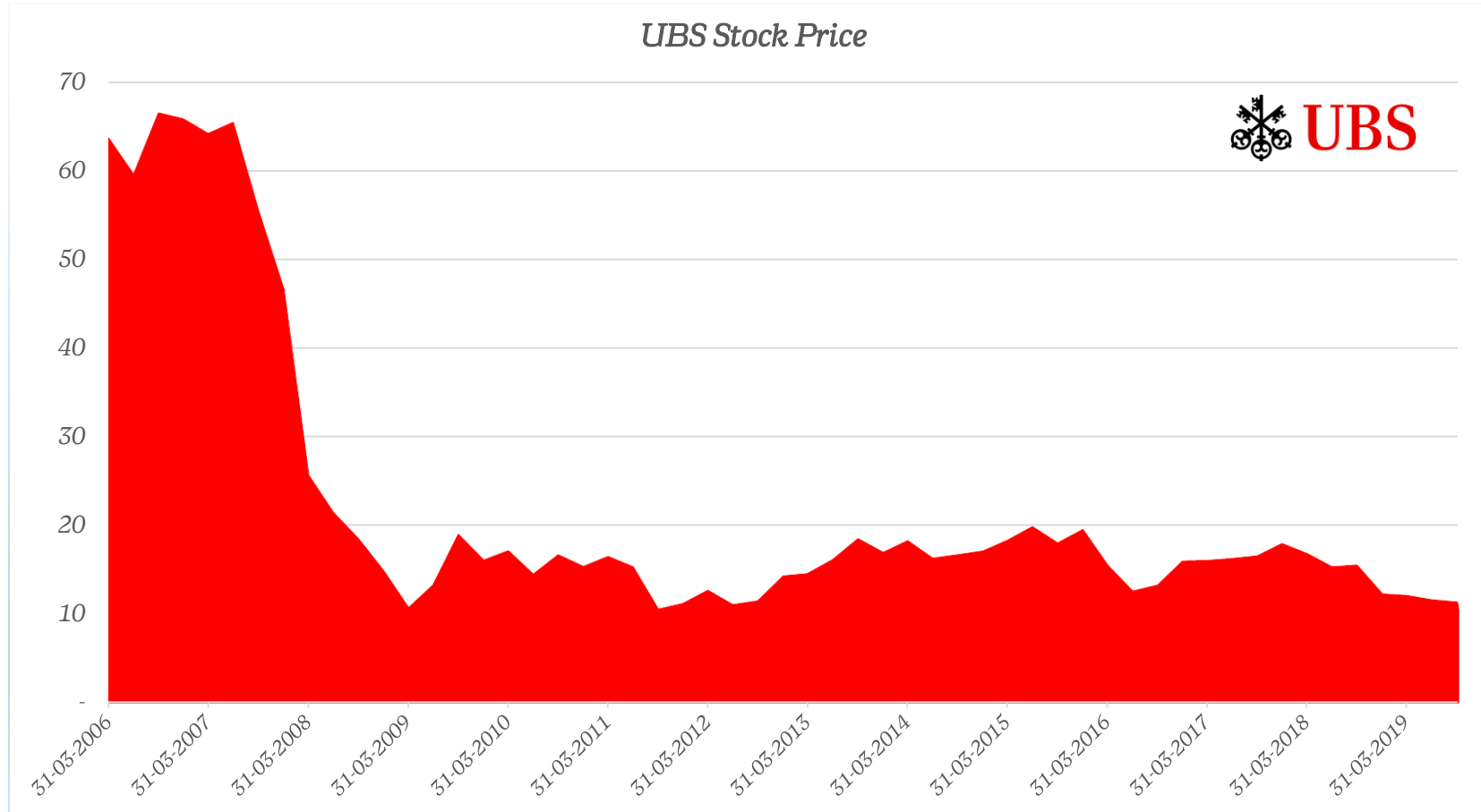
How we ended up doing Foreign Exchange (FX) at Danske Bank



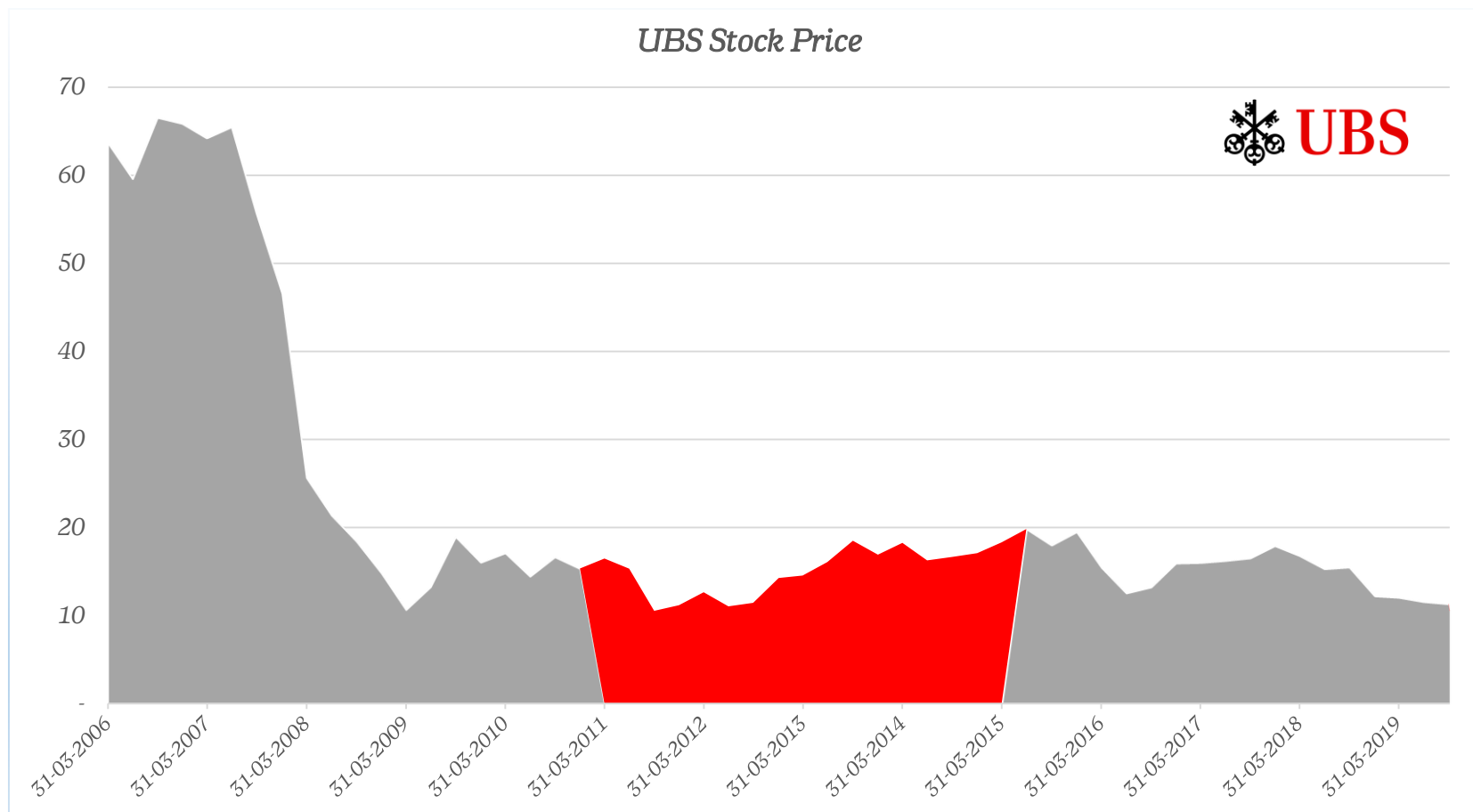
How we ended up doing FX at Danske Bank



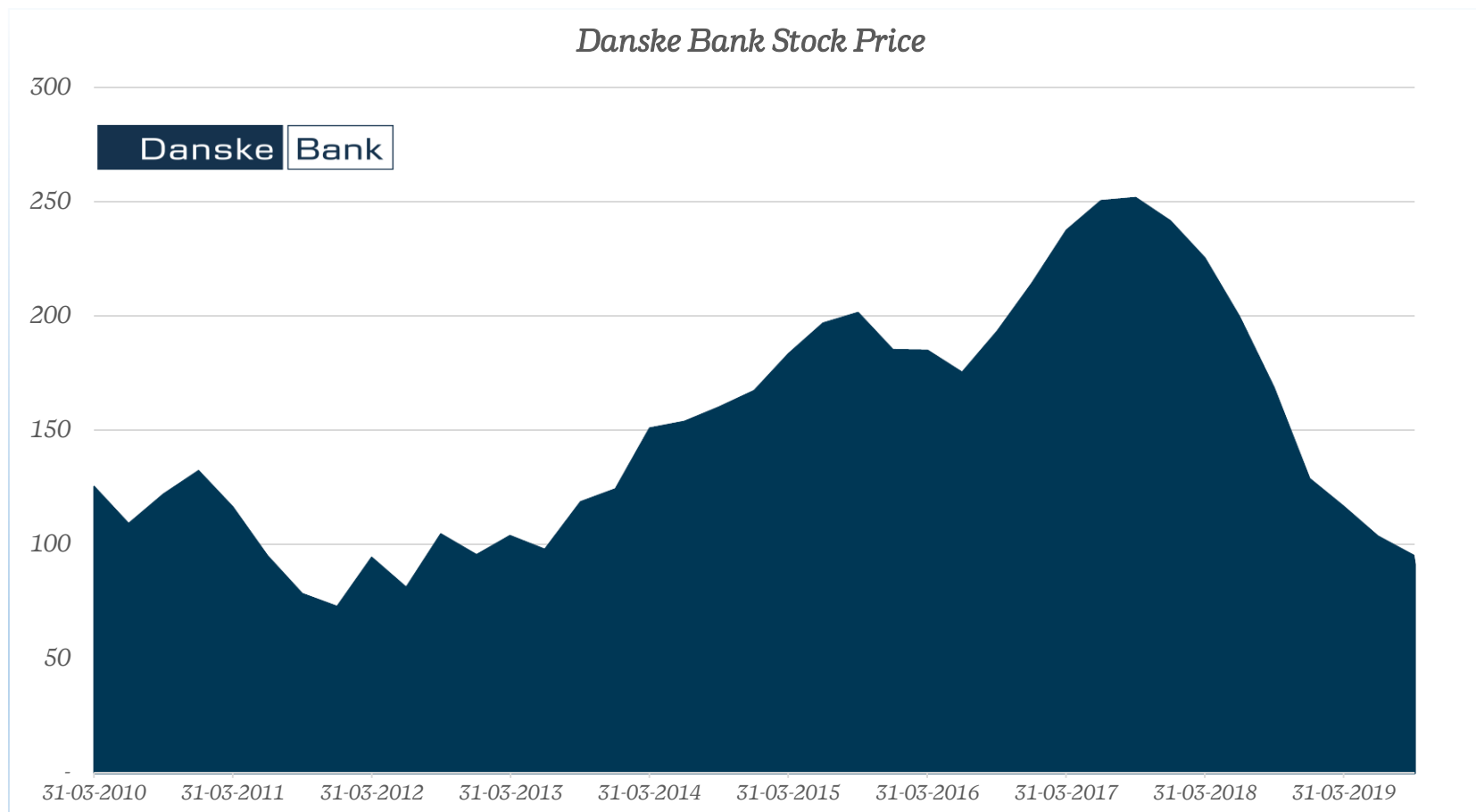
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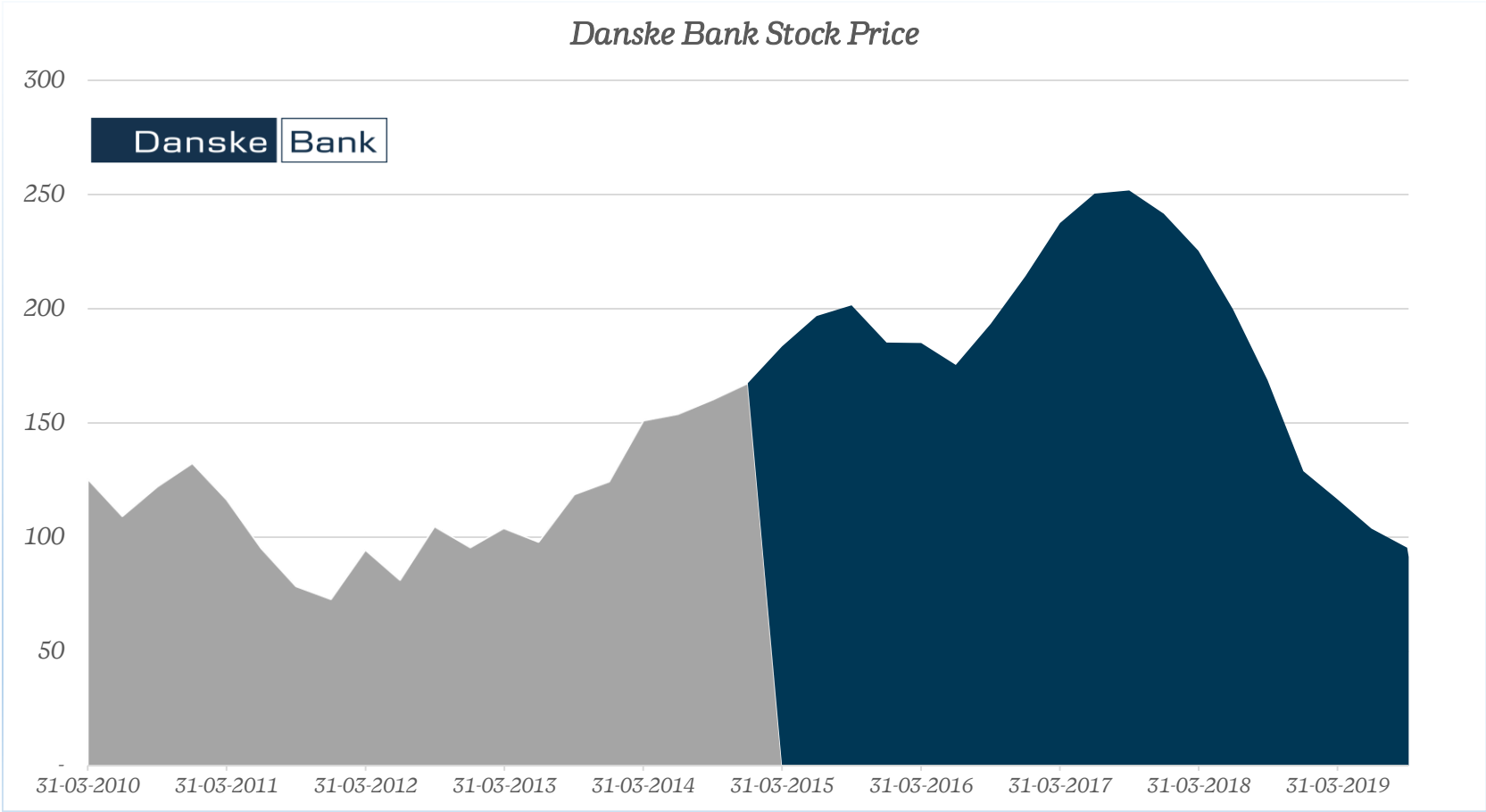
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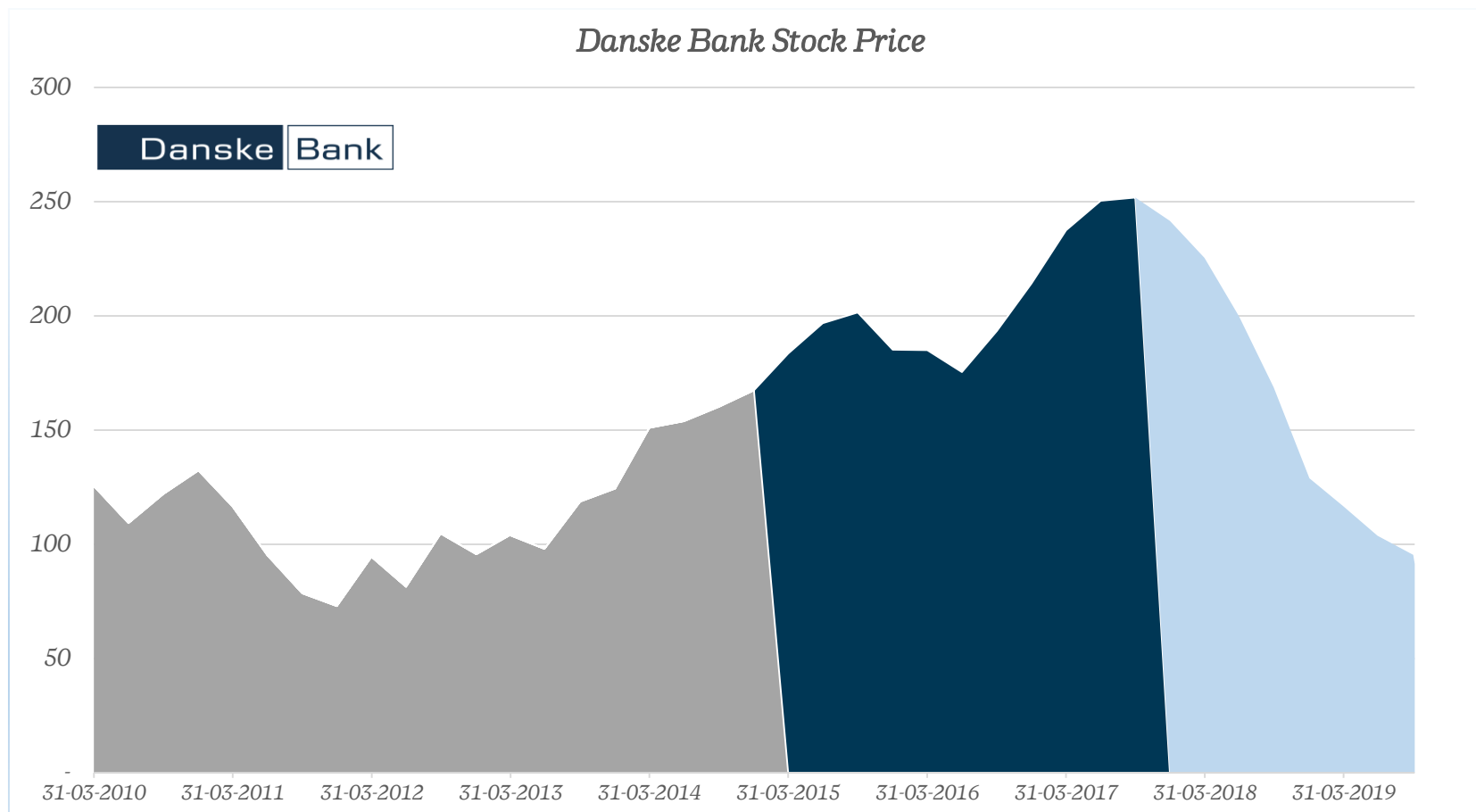
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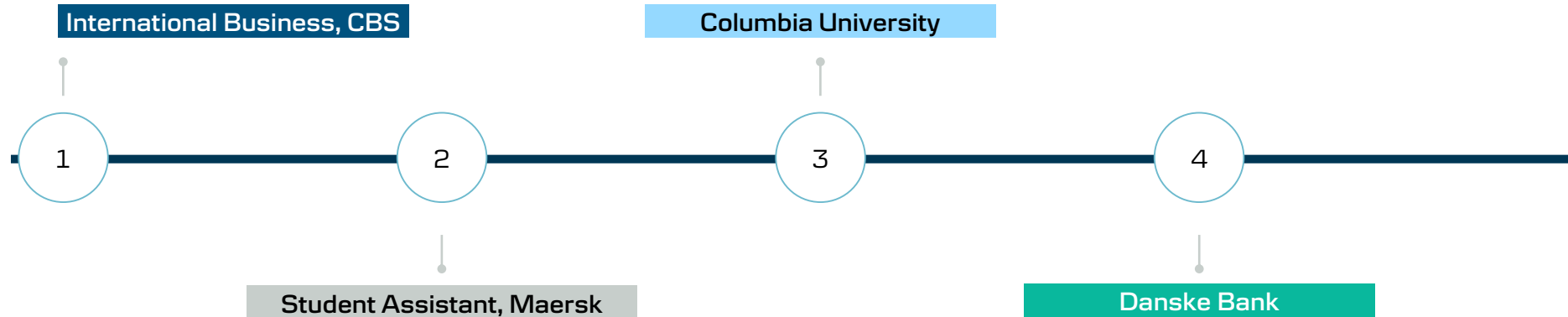
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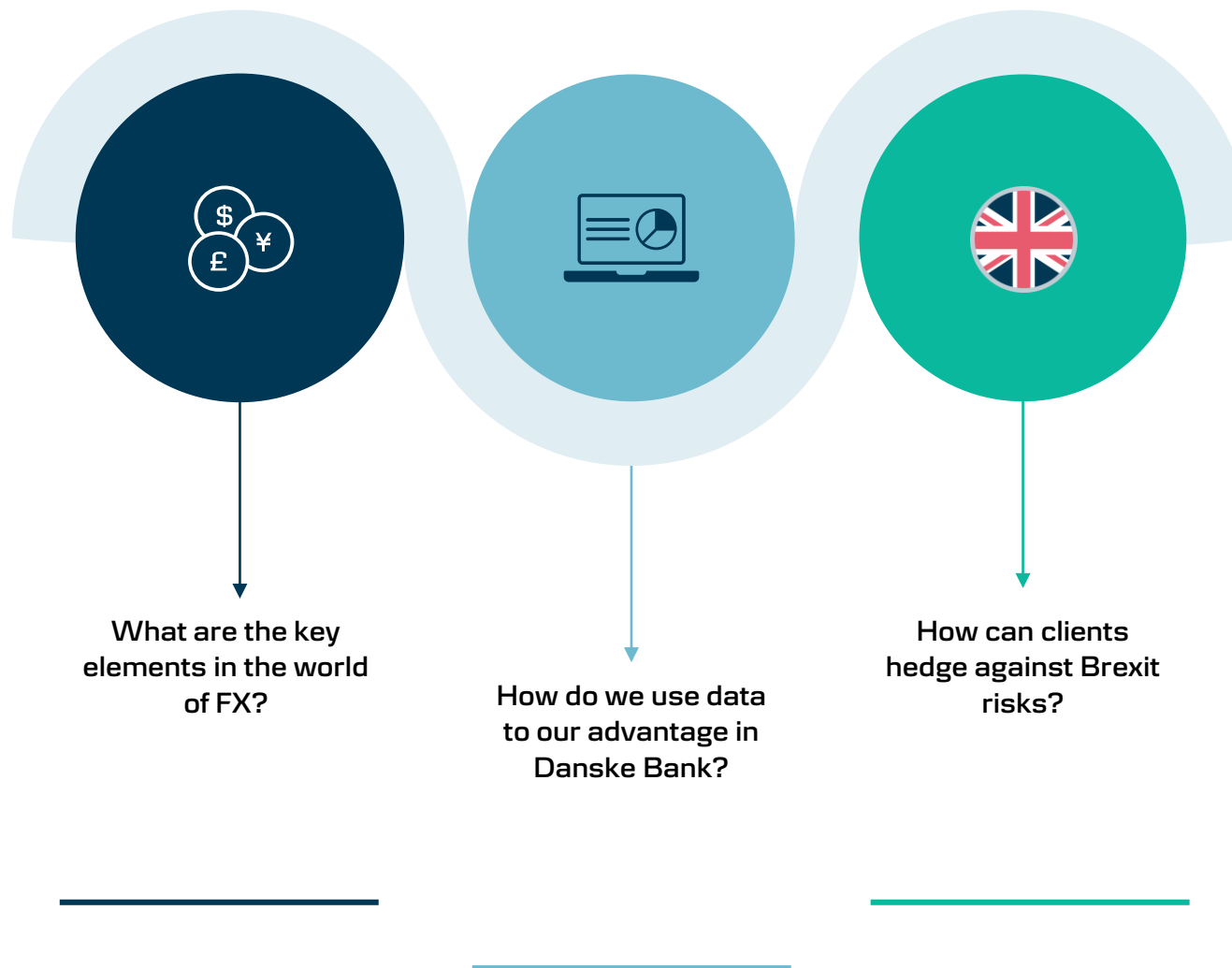
How we ended up doing FX at Danske Bank



The world of FX is littered with advanced mathematics, abbreviations, and confusing mannerisms – yet a large proportion of new hires enter with zero financial experience

Sales/Trading**Research****30th Day**

Today's objective will be to provide a simple overview of the FX market, how we visualize data at Danske Bank to derive insights, and apply these to a Brexit case



FX is the single largest financial securities market in the world, and encompasses the trading of one currency for another – it is often used to hedge business risk

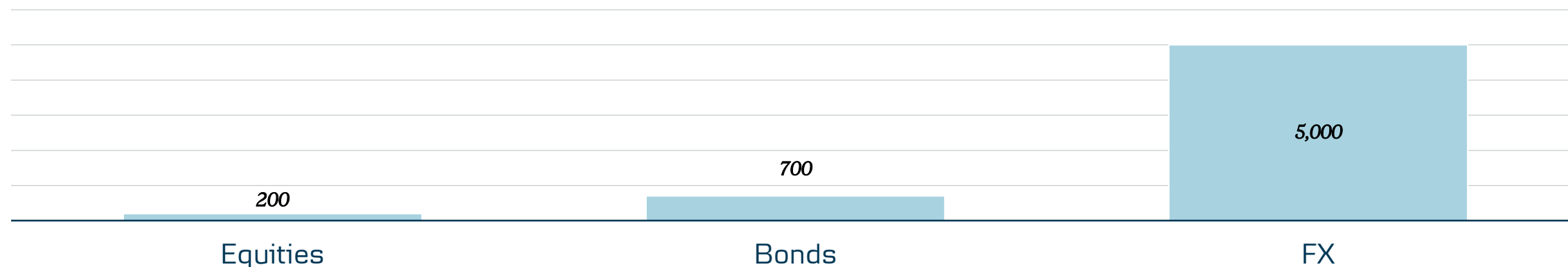
FX methodology at its core

- You always sell one currency in exchange for another
- Denoted by Main Currency / Money Currency
 - E.g. GBP/DKK
- Four main products:
 - Spot
 - Forwards
 - Swaps
 - Options

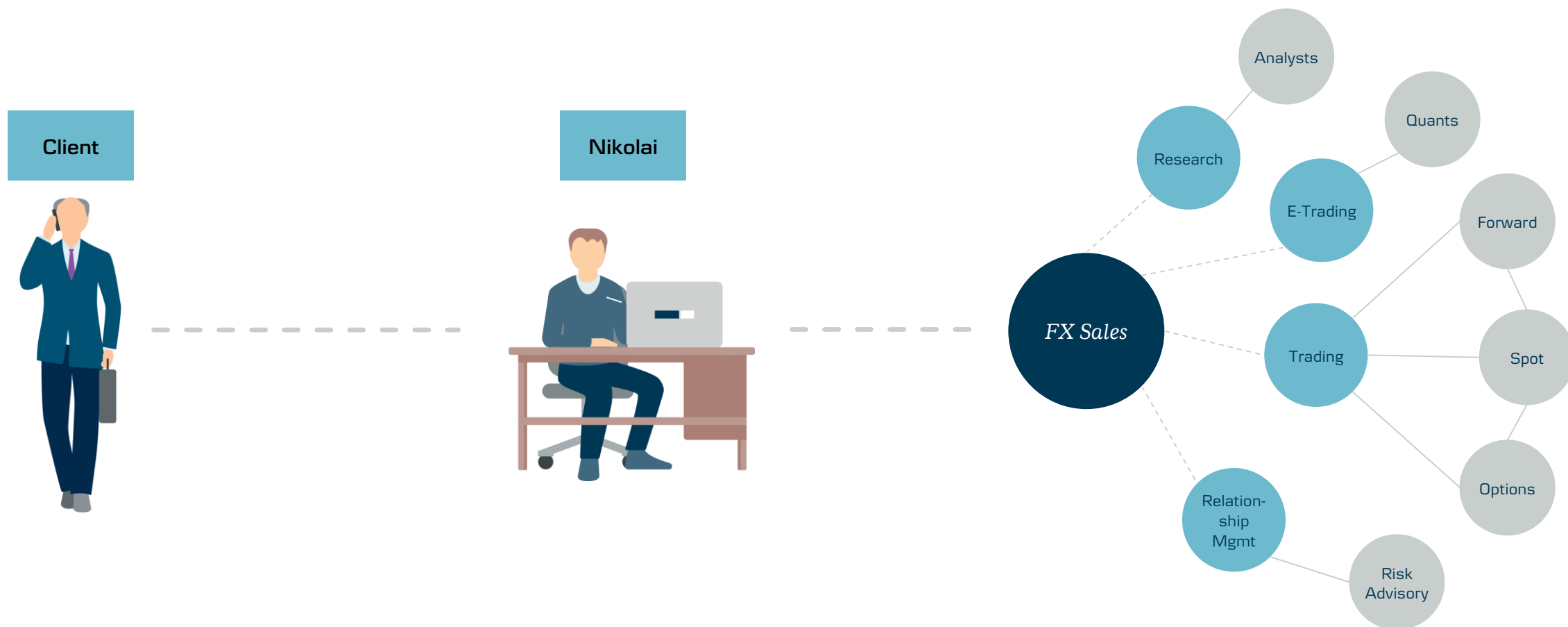
The purpose of FX trading

- Speculative bets
- Hedging risk exposure
 - Cash flows
 - Balance sheet
 - M&A transactions
- Diversification of portfolio

FX Volume (in Billion USD per day) compared to other securities



FX Sales serves as the main point of contact for our clients but a large team of experts – researchers, traders, analysts, and quants – optimize our offering behind the scenes



In Investment Banking, we generally divide responsibilities into four major roles – each of the four have distinct tasks that together form the foundation of our service



Sales



The Aggregator

- Manage and advice portfolio of clients
- Provide insights into optimal structures and timing
- Price and ultimately execute trades

Trading



The Price-Maker

- Decide the interbank prices based on liquidity
- Assume and disseminate client risk into the market
- Speculate on behalf of the bank

Research



The Eyes & Ears

- Provide official forecasts of market movements
- Analyze market events and make it actionable
- Help clients understand the market implications

Quant



The Engine

- Manage the bank's price engines
- Build analytical models for multiple stakeholders
- Quantify the bank's various risks

In Investment Banking, we generally divide responsibilities into four major roles – where each role requires unique skills and preferences in terms of tasks and responsibilities

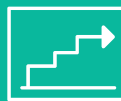
Sales



People person

- Generalist with broad interests
- Able to concise info from multiple sources to disperse stakeholders
- Capable of emphasizing with stakeholders

Trading



Risk taker

- Detail-oriented
- Ability to handle ups and downs constructively
- Need for extreme specialization
- Driven by immediate results

Research



Economist

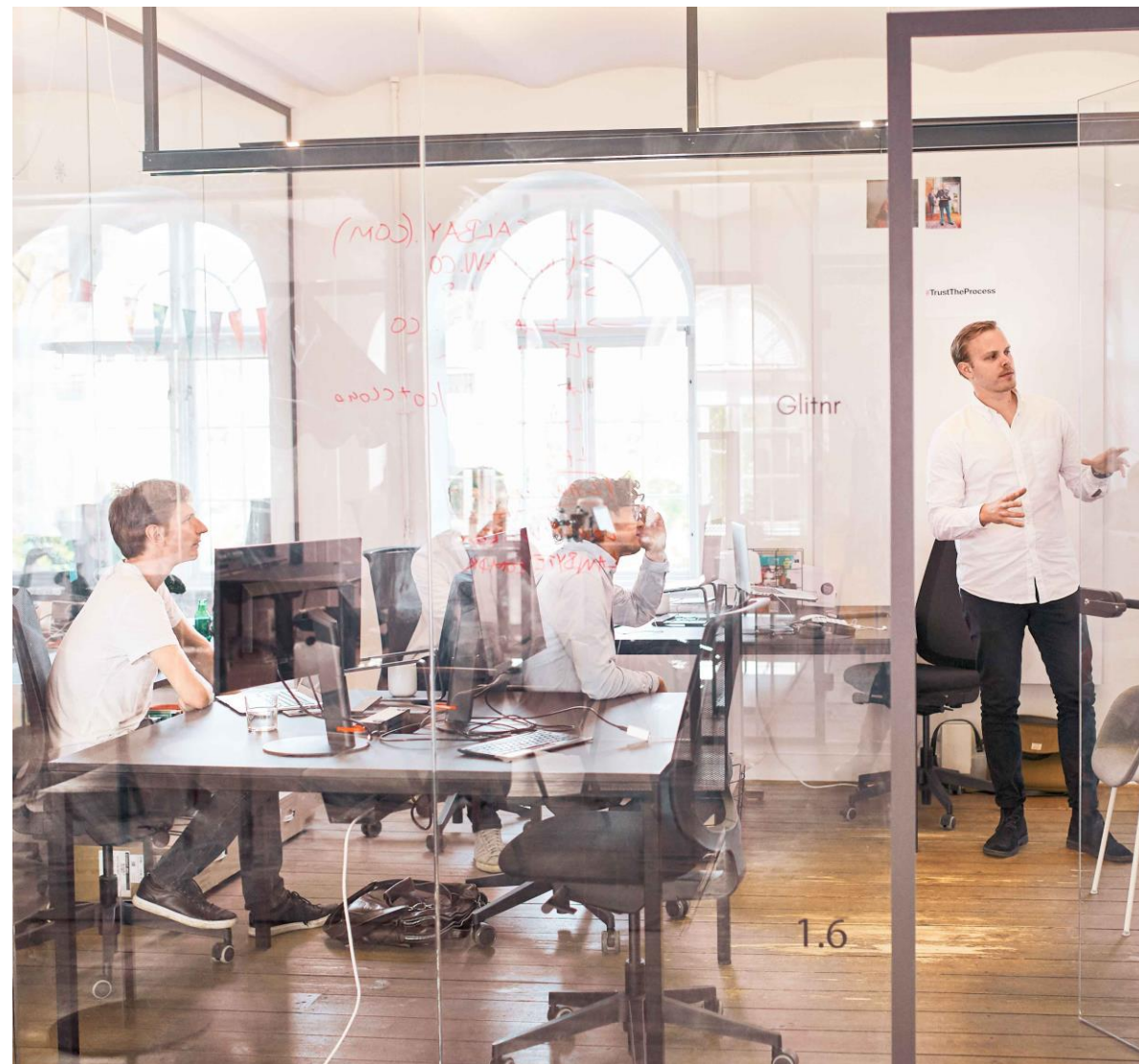
- Comfortable with presenting in front of large crowds
- Able to always monitor markets
- Interested in political causality

Quant



Mathematician

- Process-inclined
- Strong coding skills
- Software-adept and creative in use of systems
- Strong quantitative toolbox
- Long-term productivity



Despite the division of responsibility, a culture of collaboration and co-dependency limits silo creation and fosters knowledge sharing across functions and product areas



An open-minded approach makes it possible to seek help and guidance from colleagues within one of the core divisions, or even from others areas in the bank

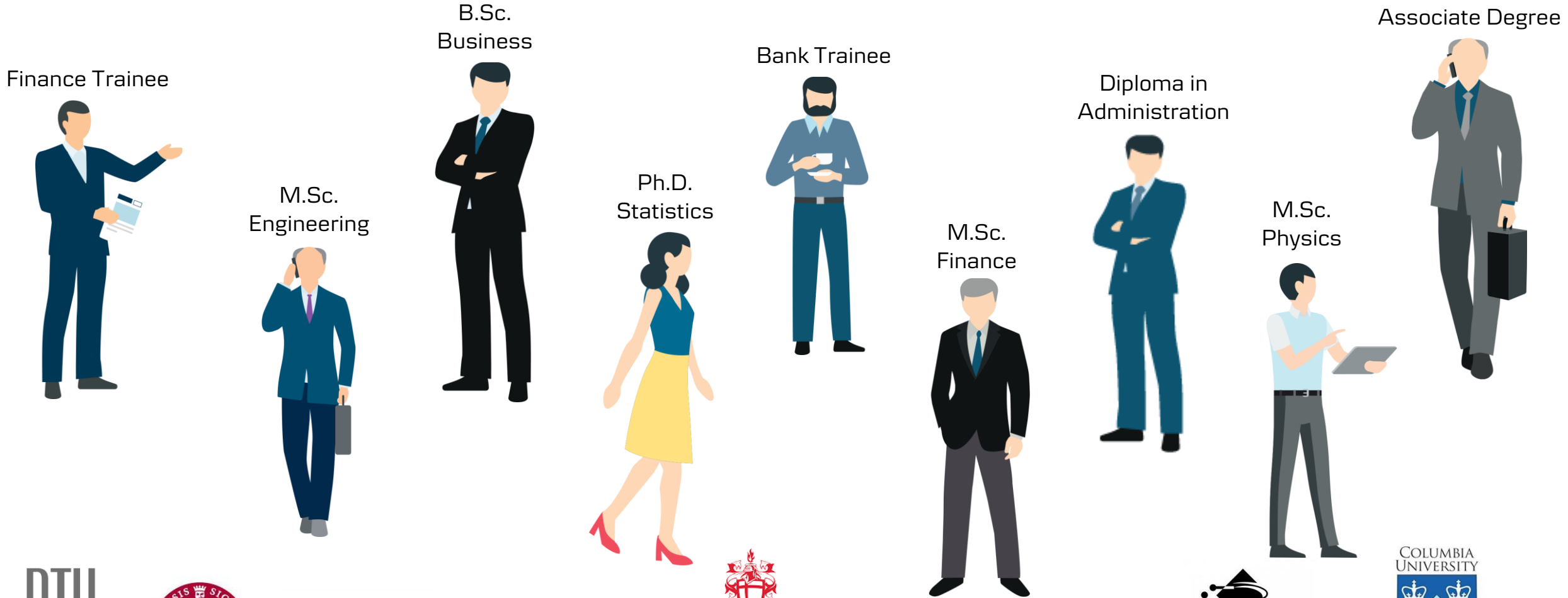


We often hold internal seminars or lectures to inform colleagues about ongoing business, changes or other cases of interest

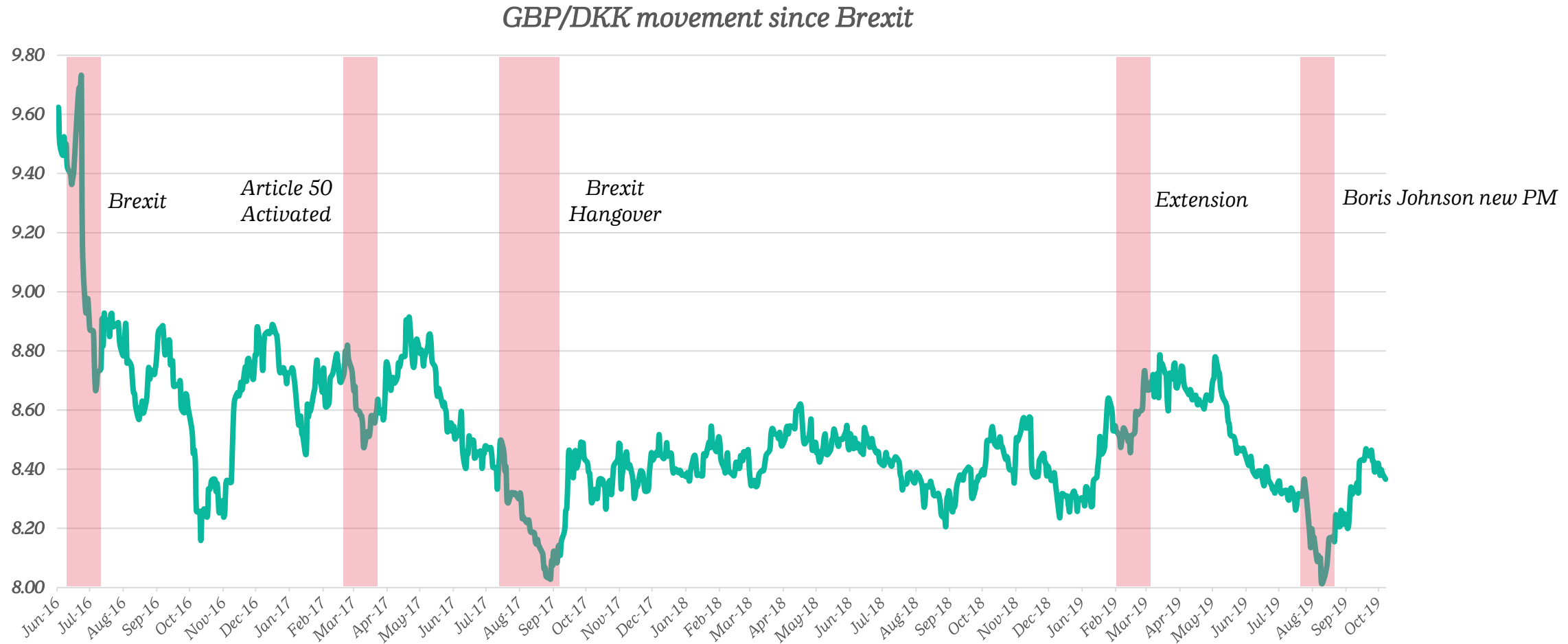


Possibility to organise days where you can observe a colleague to learn more about their job - especially early on to create a broader perspective

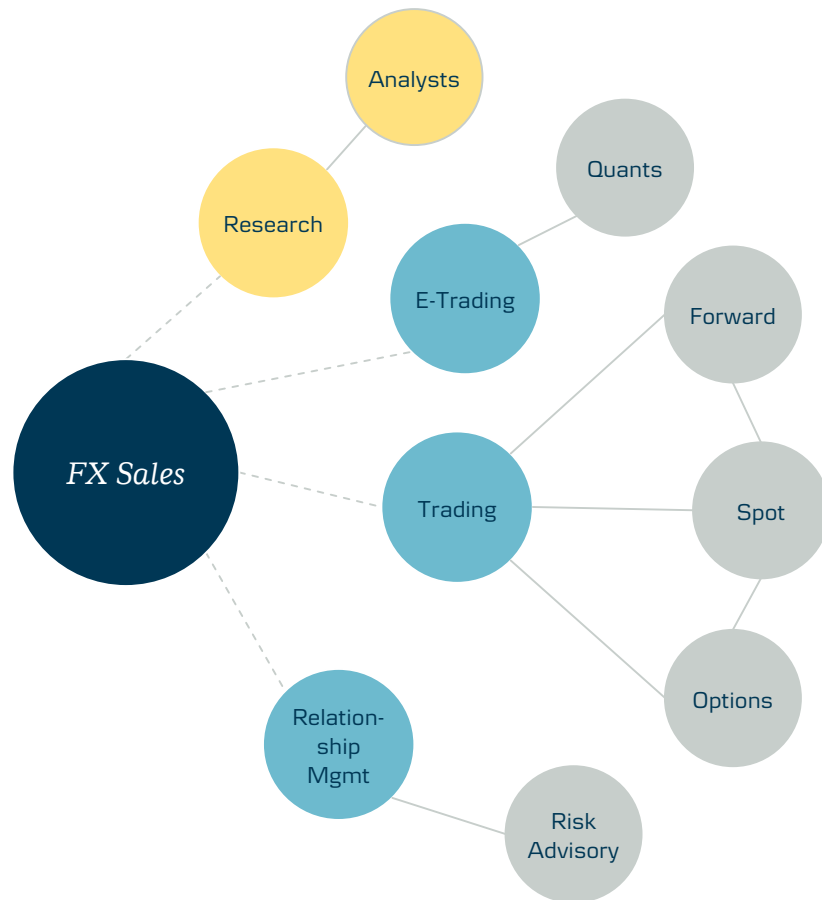
The various roles in the ecosystem require a broad shared skillset – creating an organization with diversity of thought despite limited demographic diversity



We are able to create value for our customers by consistently anticipating market movements based on a combination a deep knowledge of economic causality chains



The main responsibility of forecasting market movement falls on our Research department, who utilizes macroeconomic and statistical models to predict rates



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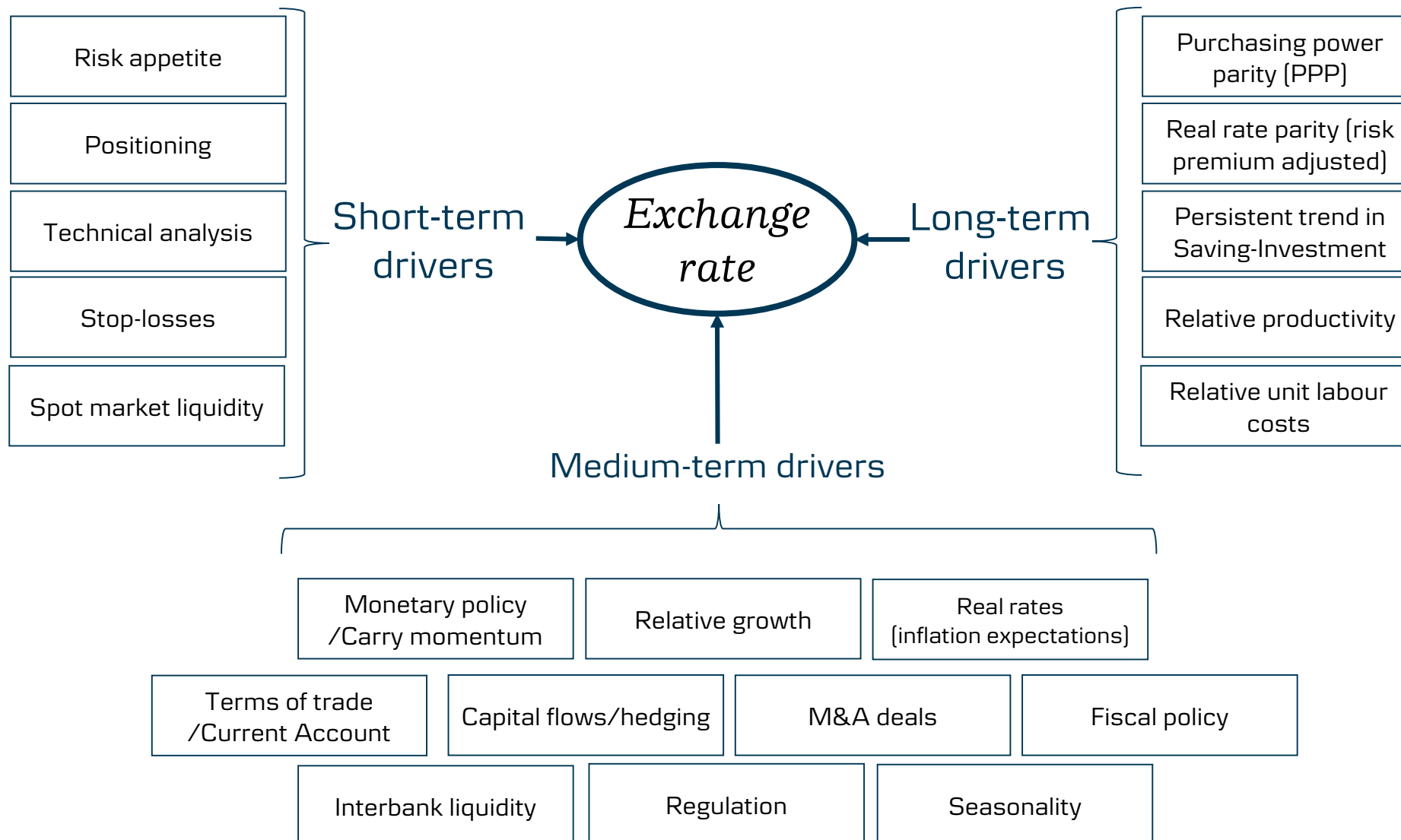
Quant



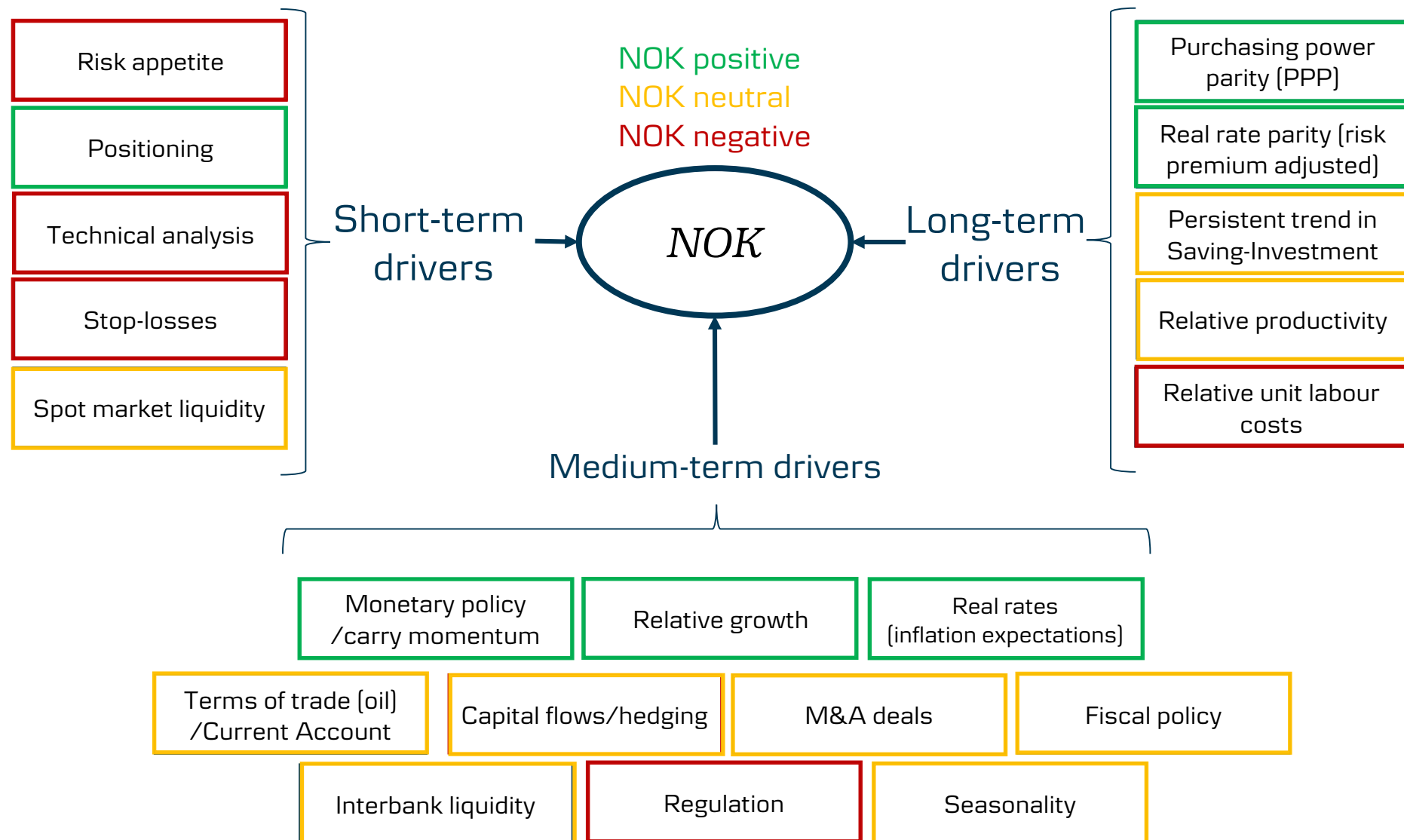
The Engine

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- Build analytical models for multiple stakeholders
- Quantify the bank's various risks

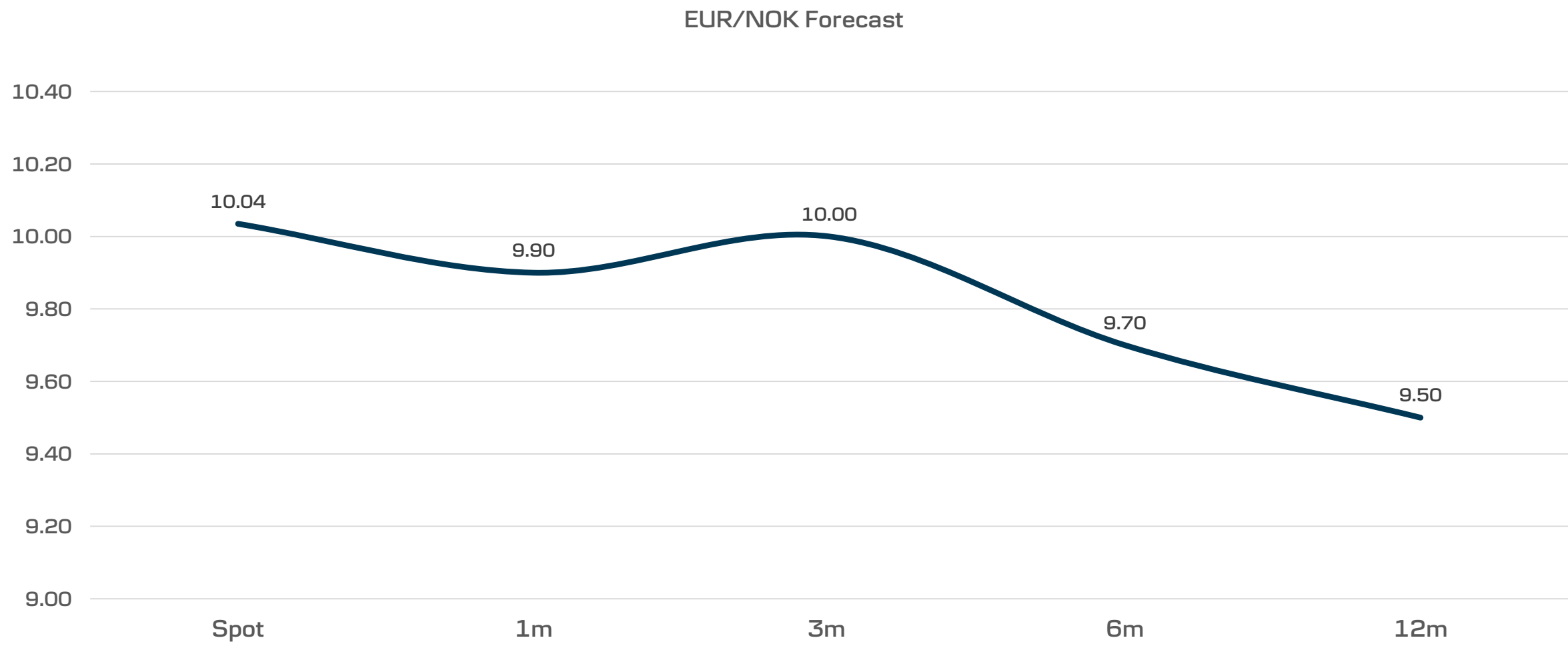
Research weighs a host of disperse economic indicators to forecast exchange rates



Applied to the Norwegian currency (NOK)

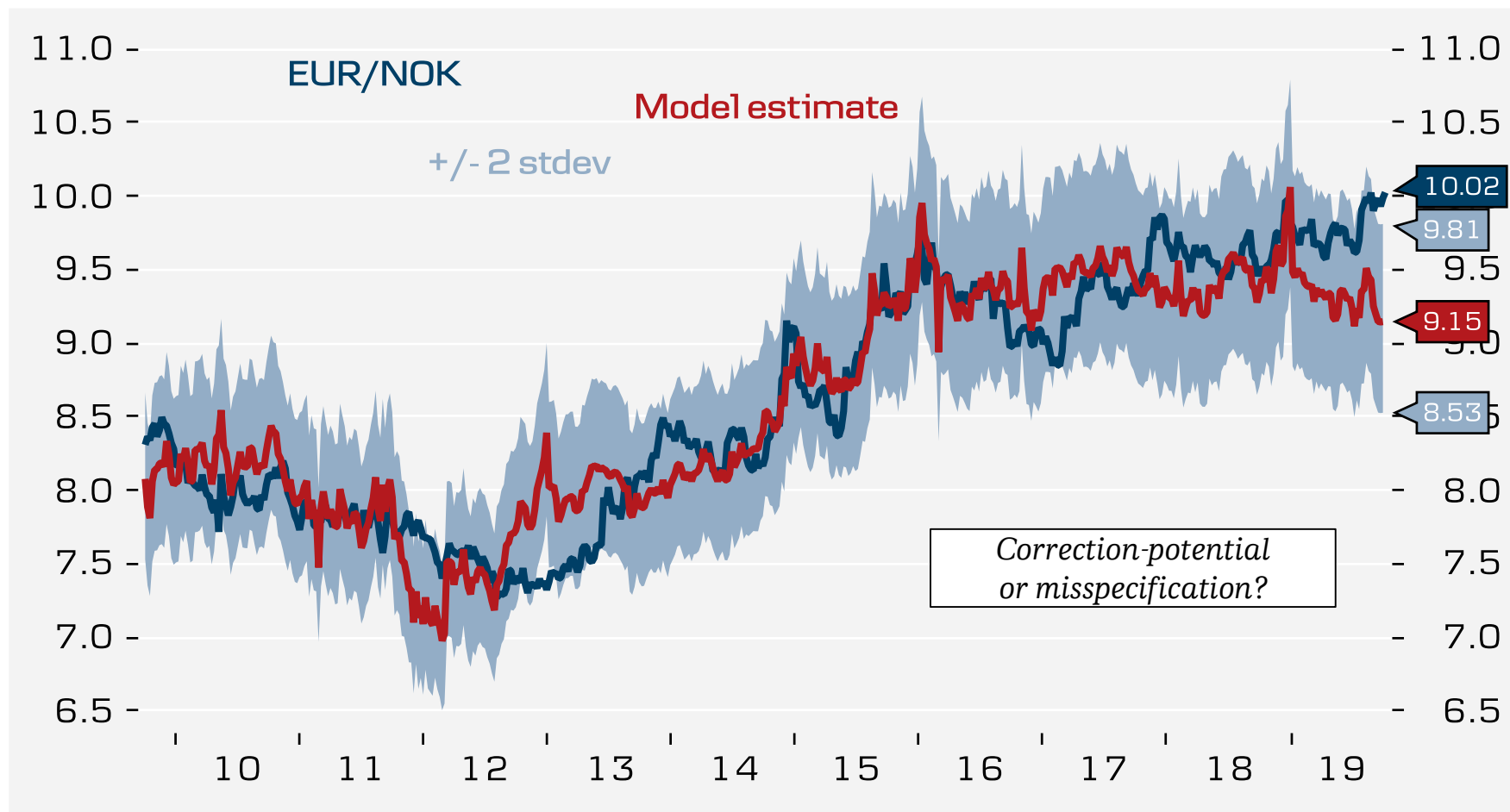


Ultimately, the impulses result in the following official forecast



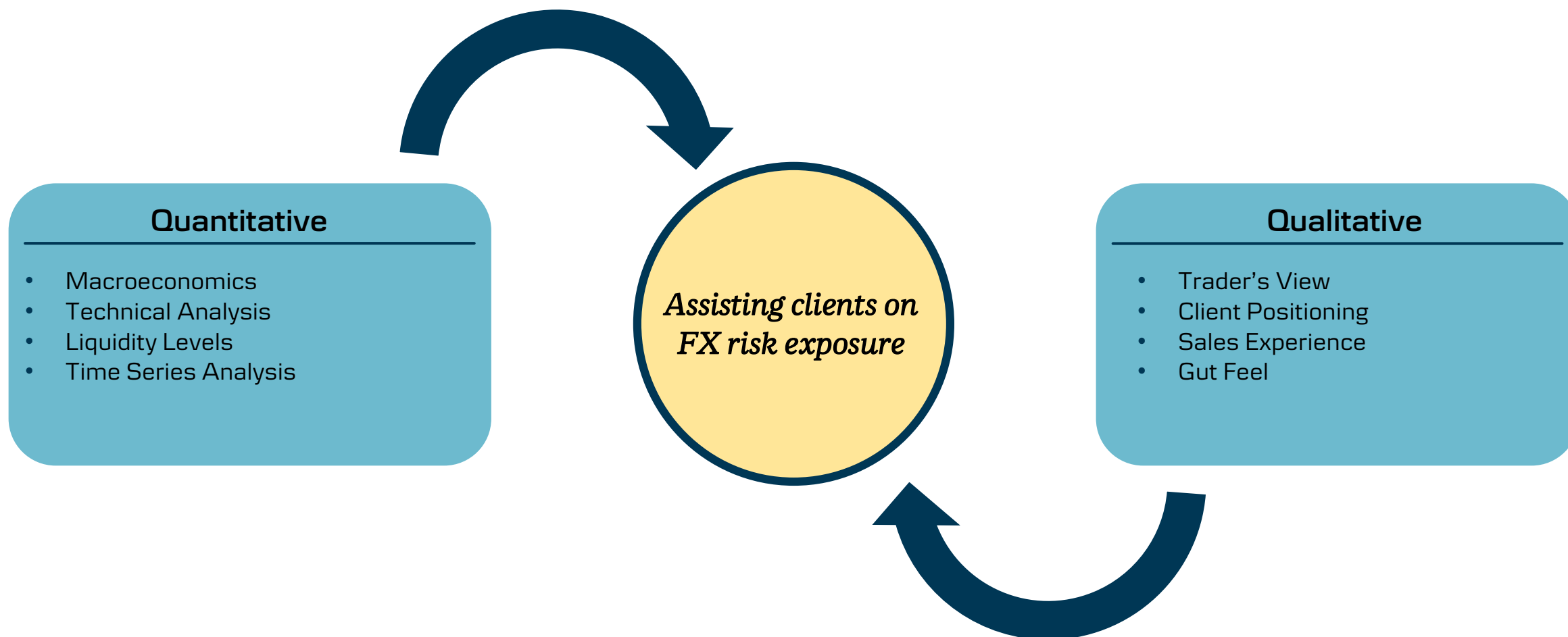
We continuously tailor our models to fit real life patterns and act on their insights

$$\ln(\text{EUR}/\text{NOK}) = \beta_0 + \beta_1 \text{FX forward yield}^{3M} + \beta_2 \text{10Y real swap rate spread} \\ + \beta_3 \ln(\text{oil}) + \beta_4 \text{VIX} + \beta_4 \text{PIGS 10Y Bund spread} + \varepsilon$$



Note: 10Y regression window, weekly observations, all variables statistically significant on 99% confidence level, $R^2=0.88$
Source: Macrobond Financial, Danske Bank Markets

The ability to – on average – anticipate market movements can be attributed to the process of accurately weighing qualitative and quantitative input from relevant parties



We are still at an infant stage in our utilization of data but the good news is that we have an abundance of databases and sources from which to create a foundation



Individual drives



Shared datasets



CRM portals



Legal documentation



Trading systems

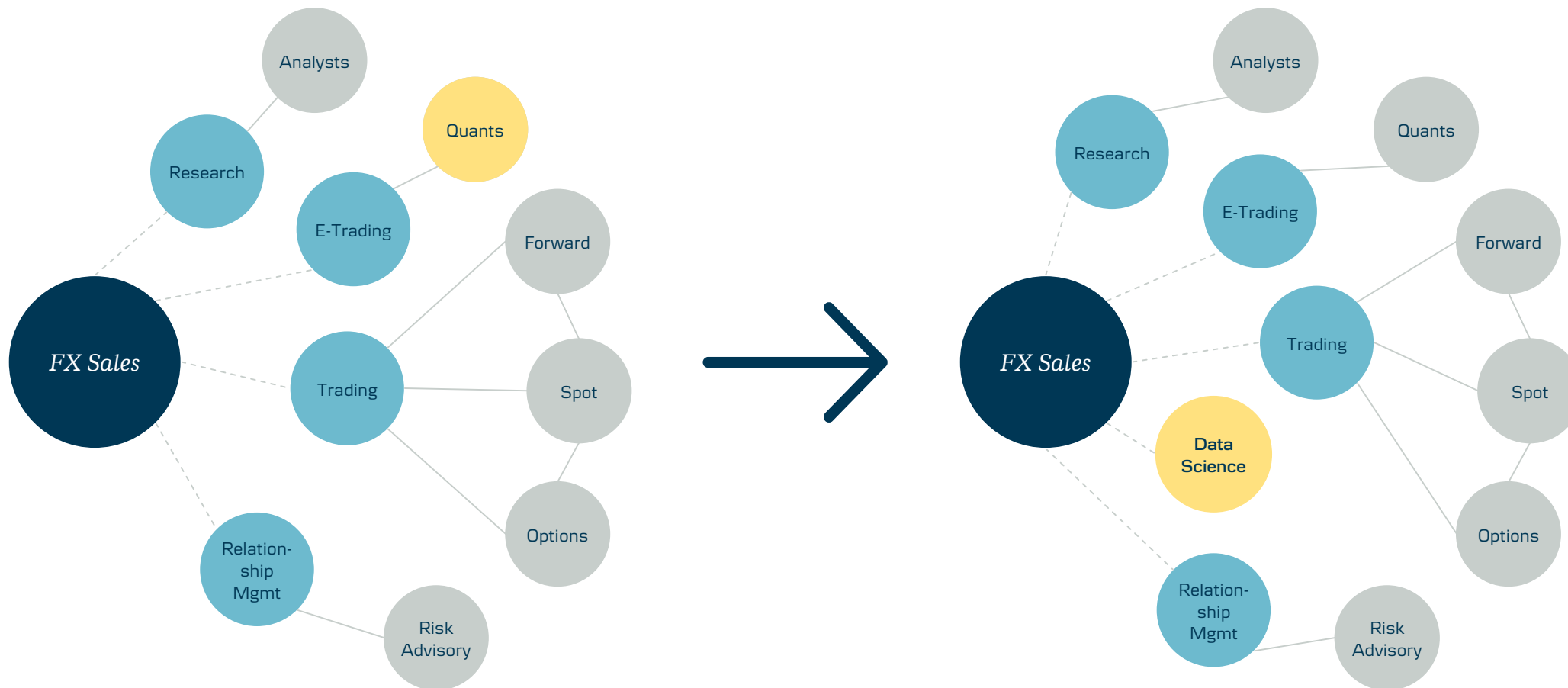


Performance archives



Economic research

Now, we are attempting to further encourage collaboration across roles to further break down the old school silos that still persist from when investment banking took off



In order to successfully integrate data science into our general decision making, we need the right competencies and that's why we are currently looking for a data science profile



First Year Analyst in Data Science, Investment Banking

First Year Analyst Programme

- 18 months (possible to do rotations)
- Develop with other new hires to build a strong network within the bank
- Learning modules with senior management
- Opportunity to stay with same team upon completion of the programme

The Role

- Responsible for building a decision sciences foundation for our trading floor
- Work autonomously on data science project, often of own choosing
- A unique opportunity to work with data science in a front office role where you will also learn the dynamics of the largest securities market in the world

Qualifications

- M.Sc. in relevant field
- Entrepreneurial mind-set and an ability to drive change
- Self-driven and able to execute on projects and communicate findings
- Strong analytical skill set
- Fluent in a program language (which one is not relevant)
- Proficient in English and a Scandinavian language is a +



1. Plotting future
Brexit cash flows



2. Finding a pattern
in GBP/DKK returns



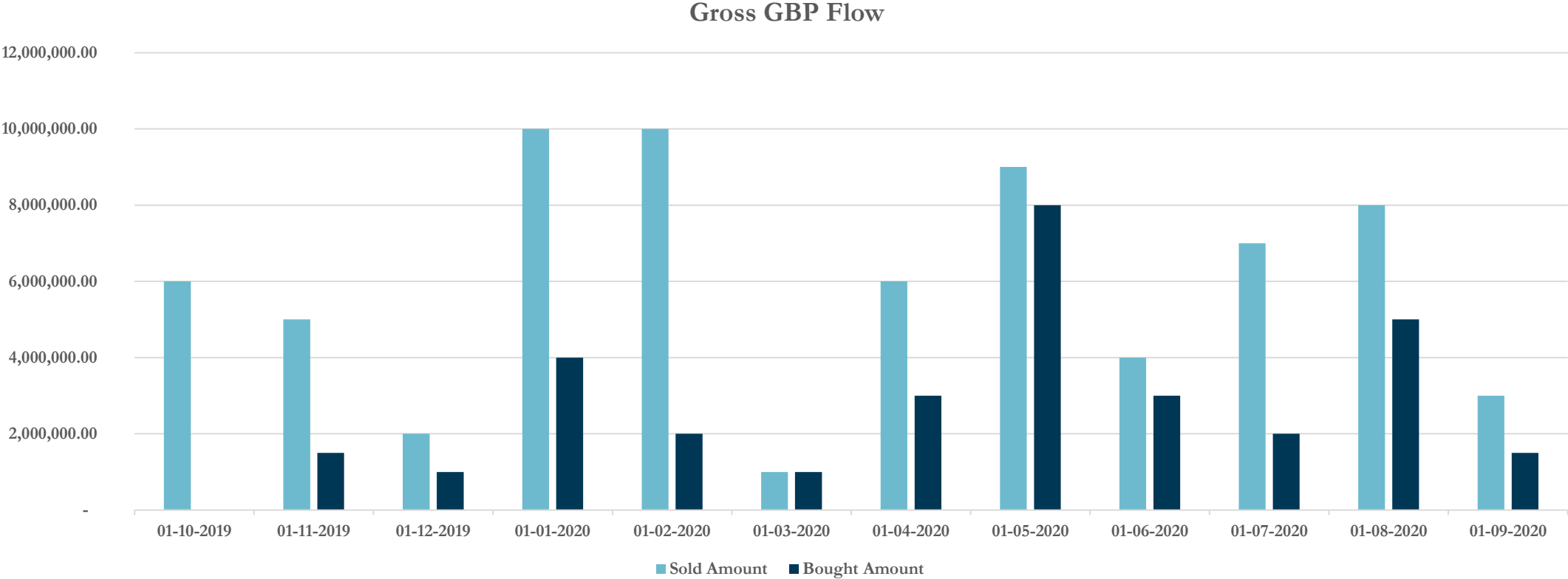
3. Mix-and-match
events and returns



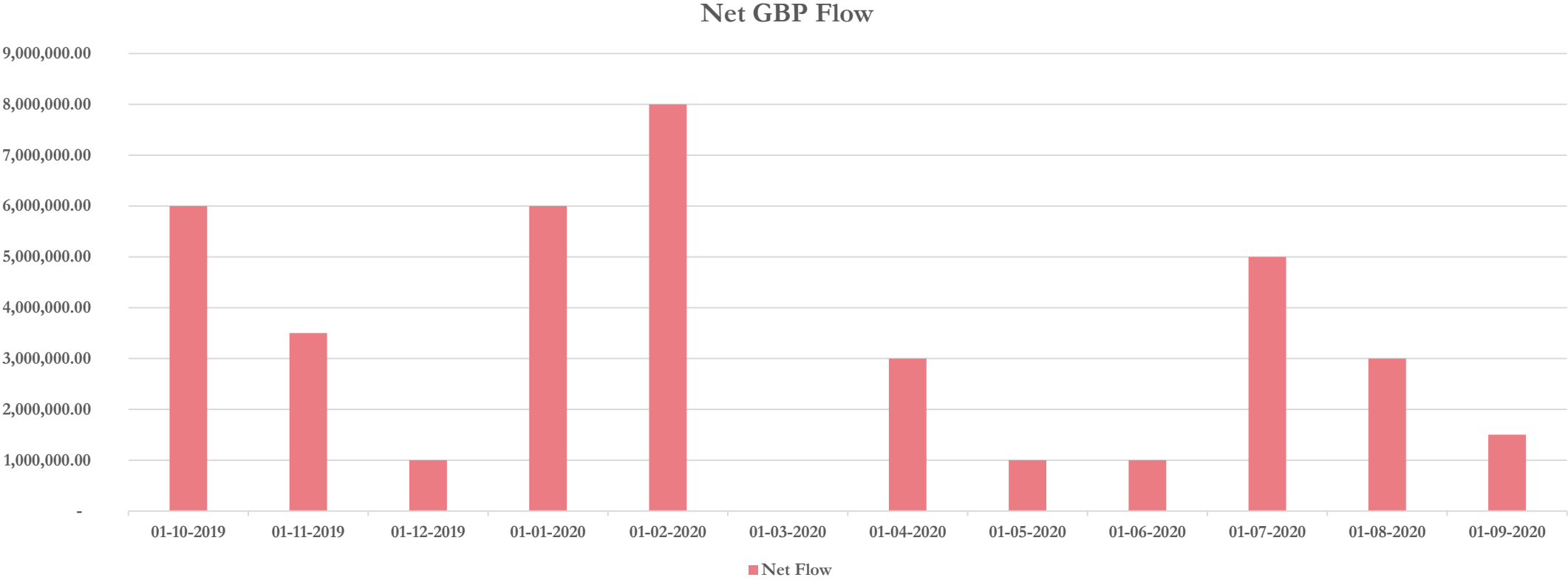
4. Choosing the
hedging product

Brexit Case

Case Solution 1a

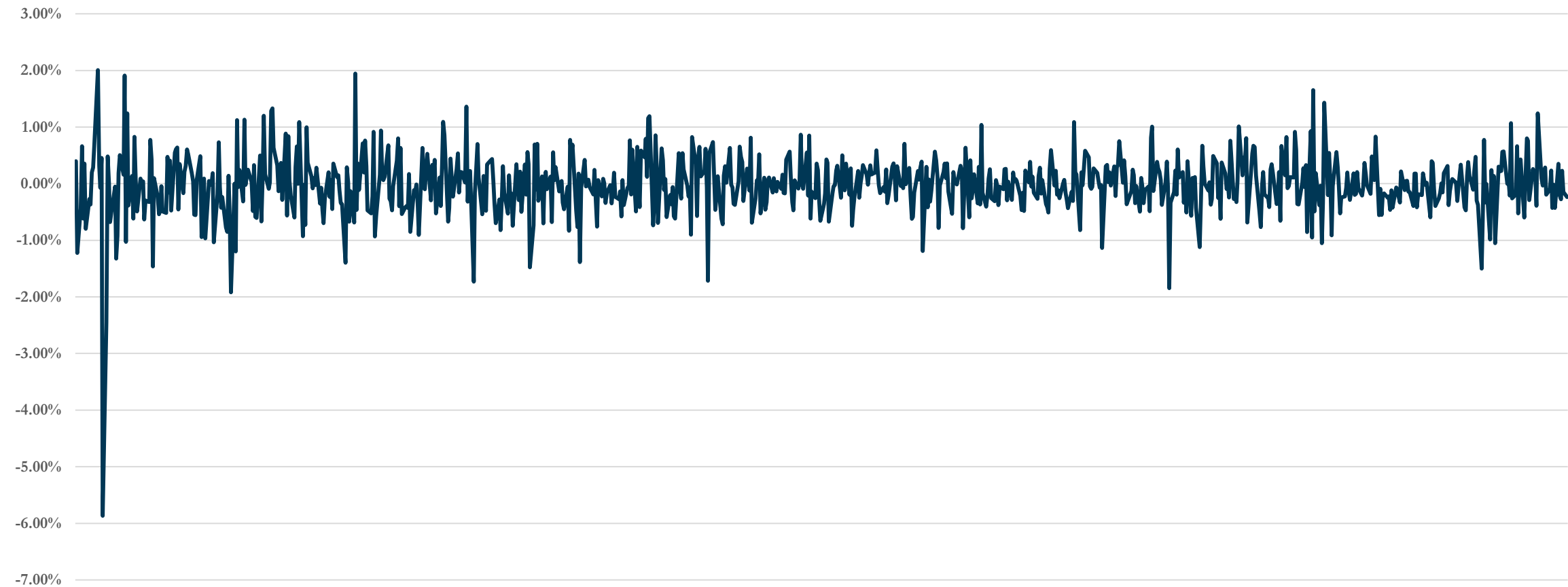


Case Solution 1b

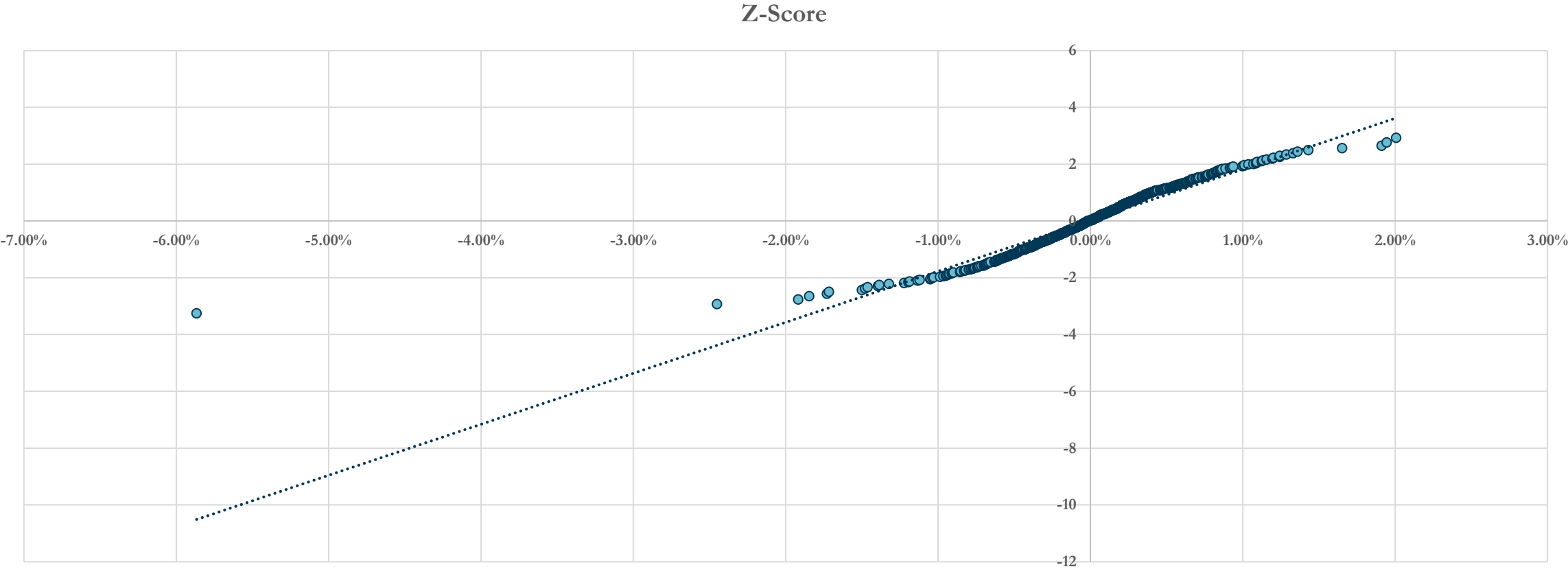


Case Solution 2a

GBP/DKK Returns

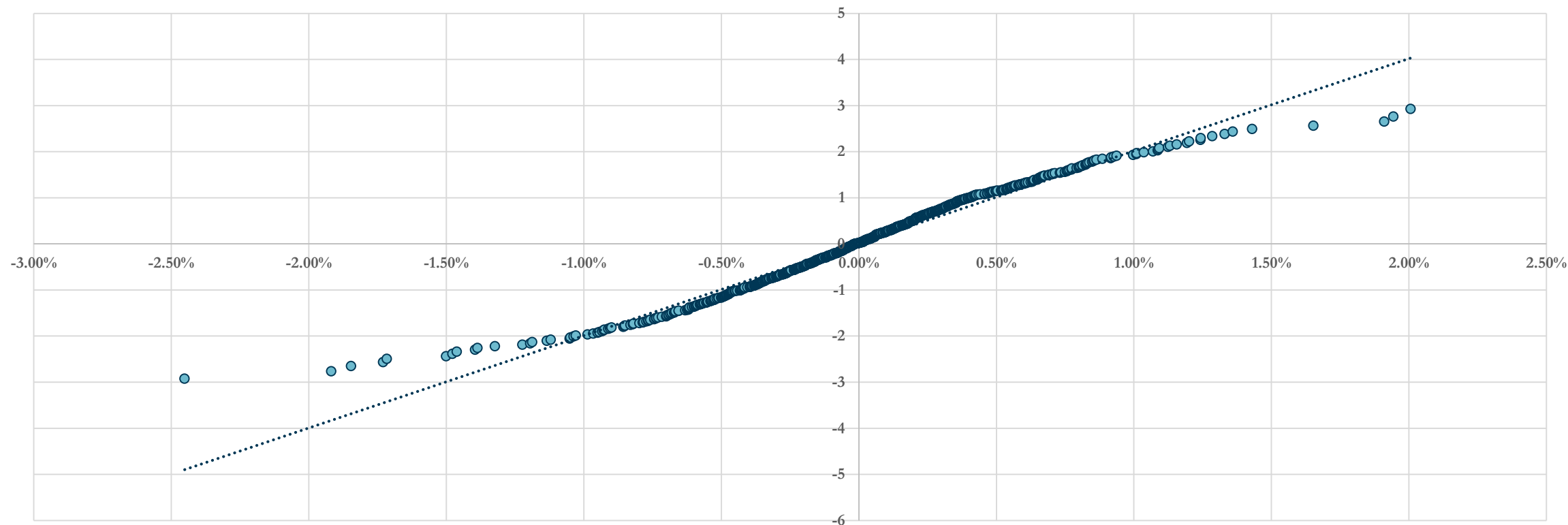


Case Solution 2b



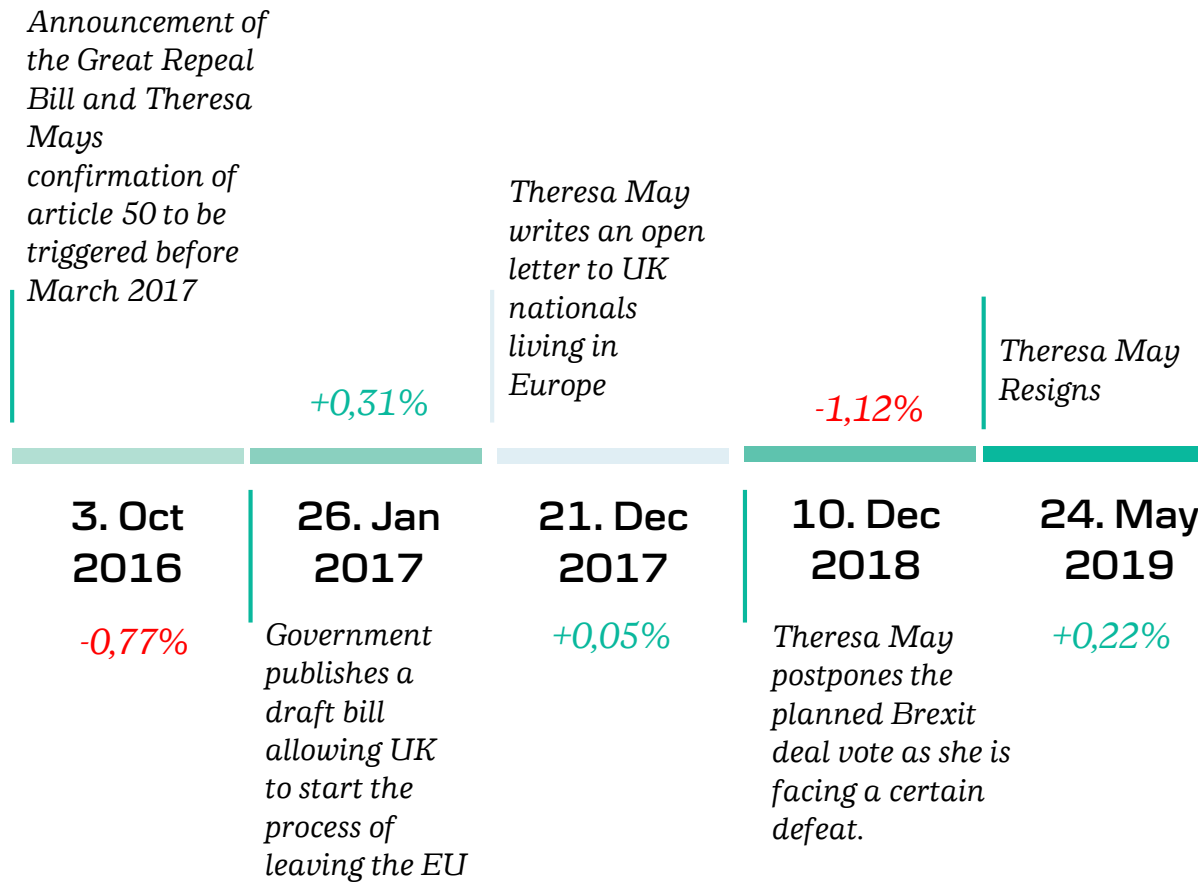
Case Solution 2b

Z-Score (Outlier-Adjusted)

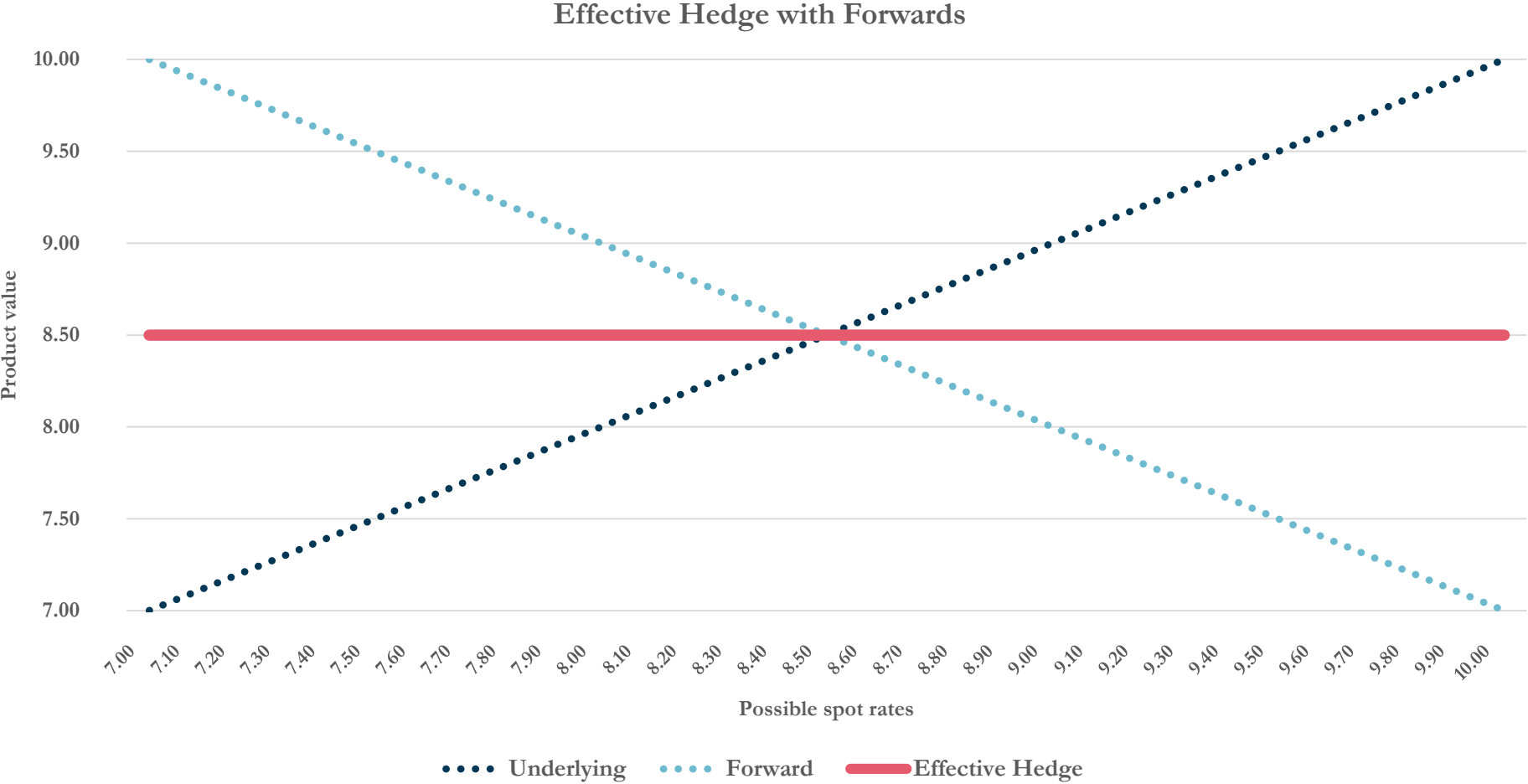


$JB = 0,00005 \rightarrow \text{Reject Null Hypothesis}$

Case Solution 3



Case Solution 4



Case Solution 4

