

# Decoding the Impact of Institutional Investors on Market Supply and Demand

Using artificial intelligence to expose patterns in the allocation behaviours of institutional investors

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## Introduction

At the most intuitive level, we understand markets in terms of price. Investors, financial journalists, board rooms and investor relations teams often use stock price as a proxy for investor sentiment, views and expectations. The association between price and investors' views exists because of the laws of supply and demand: we interpret rising prices as indicative of increased investor demand for a company's stock and vice versa. Supply and demand arise as different investment strategies respond to changing market opportunities and risks, as investors' views and expectations develop, evolve and influence their decisions to allocate capital and risk within portfolios.

Irithmics' AI learns to recognise and classify patterns in how institutional investors manage their portfolios and exposures towards different companies. Identifying these patterns allows Irithmics to describe and anticipate the allocation behaviour of investors. Three main components of Irithmics' AI make this possible: firstly, a set of deep neural networks evaluate and model the views and expectations behind institutional portfolios and allocations; secondly, reinforcement learning models learn how investors' views and behaviours combine to form viable investment strategies; and thirdly, agent based modelling and generative adversarial networks anticipate how investment strategies, views and markets interact, thereby affecting the allocation of capital and risk by institutional portfolios. Observing the activity of institutional investors

in this way provides an enhanced understanding of market behaviour and dynamics.

The allocations and reallocations of portfolio capital by institutional investment strategies generates market demand and supply respectively for a company's stock. As institutional investors face similar constraints and attempt to address these in similar ways, there is a tendency for these investment strategies to show some degree of isomorphism which increases the probability of seemingly coordinated allocation and reallocation behaviour. This phenomenon is commonly exploited and leveraged by corporate investor relations teams to target investors and for capital access campaigns: "Investors like this also invested in companies like this."

However, when sufficiently acute, it has been suggested by Nobel laureate, Robert Shiller, and numerous other scholars that homogeneity of views and behaviour amongst market participants can contribute to price shocks, market bubbles and crashes.

## Views, expectations and strategy isomorphism

While often convenient to describe investors' views as 'bullish' or 'bearish', such classifications oversimplify and obscure the diversity and dynamics behind investors' decisions to allocate and reallocate capital. The heterogeneity of investors' views, beliefs

and outlooks help explain volatility and liquidity.

The first component of Irithmics' AI, a family of deep neural networks, analyse available public data including regulatory and voluntary disclosures by corporates and asset managers. The AI learns to encode position, exposure and holdings data to different views and confidences of absolute or relative performance of a security.

Figure 1 shows the heterogeneity of views towards Tesla recognised and classified by Irithmics' AI on Jan 11, 2021. The transparency provided by deep neural networks into the views and expectations on Tesla's institutional investors can help explain the change in the company's stock rally from Nov 2020 to Jan 2021.

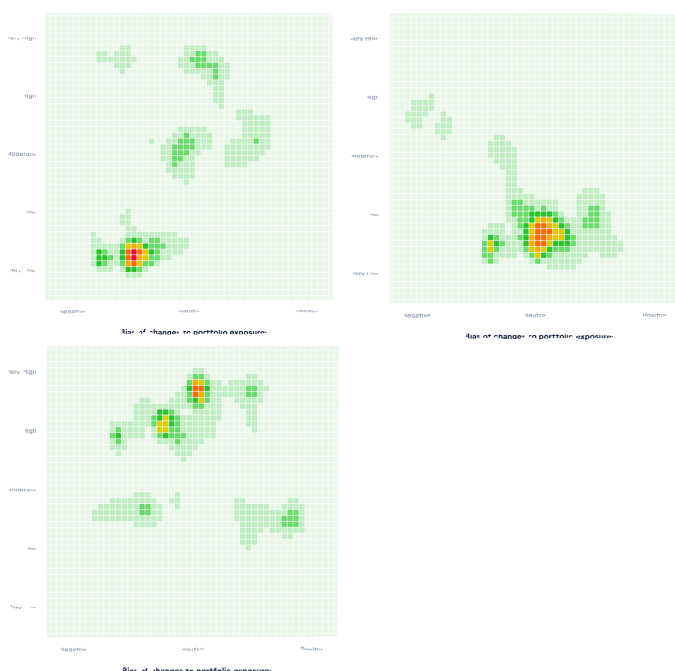


Figure 1: Heterogeneity of Strategic, Tactical and Speculative views towards Tesla on Jan 11, 2021

Successful investing, according to economist John Maynard Keynes is “anticipating the anticipations of others.” The patterns of capital and risk allocation recognised and classified by Irithmics' AI highlight how the “anticipations of others” evolve in response to changing market environments.

These patterns are subsequently used to model the degree of isomorphism across institutional investment strategies and views, enabling Irithmics to describe and anticipate future collective allocations and reallocations and consequently future supply and demand pressure. However, while strategy isomorphism increases the probability of seemingly coordinated, homogeneous behaviour amongst investors, it does not provide deterministic certainty such behaviour will occur. This is similar to how doctors understand that certain genetic variants, environmental and lifestyle factors increase the probability of different diseases occurring, but they do not mean the disease will occur, simply that it is more likely.

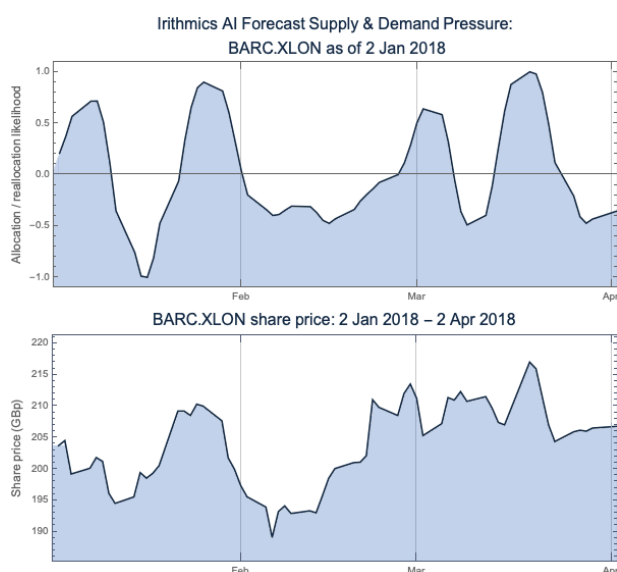
The ability to anticipate market supply and demand caused by isomorphic strategies allocating and reallocating capital in response to evolving market environments provides corporates, asset managers, stock exchanges and regulators with powerful insights into market dynamics.

To illustrate the relevance of AI-forecasted supply and demand pressure, we will consider the following illustrative examples.

### Example 1: Barclays

Irithmics AI assessment of the institutional strategies as of Jan 2, 2018 anticipates supply and demand pressure for Barclays for the subsequent 90 days to Apr 2, 2018. Just for clarity, Irithmics computed the full 90 day period to Apr 2, on Jan 2 (before the corresponding price data was observed). This is similar to how meteorological services forecast weather, providing a forecast for every day.

Figure 1a shows the forecasted supply and demand pressure for Barclays from Jan 2, 2018 to Apr 2, 2018. Demand is considered to be associated with an increased probability of institutional capital being allocated to Barclays, while supply is associated with reallocation of capital from Barclays to other securities.



Figures 1a and 1b: Irithmics AI Supply and Demand Pressure for Barclays on 1 Jul 2020

These forecasts show anticipated increase in demand associated with isomorphic institutional strategy allocation of capital:

- towards the end of Jan 2018
- late Feb and early Mar 2018, and
- mid-Mar 2018.

Similarly, the forecasts anticipate reduced demand and increased supply:

- mid-Jan 2018
- from late Jan to early Mar 2018
- early Mar 2018, and
- late Mar 2018.

Figure 1b shows Barclays share price over the same period.

## Example 2: IAG

Irithmics AI assessment of the institutional strategies as of Jul 1, 2020 anticipates supply and demand pressure for IAG for the subsequent 90 days to Sep 29, 2020. Just for clarity, Irithmics computed the full 90 day period to Sep 29, on Jul 1 (before the corresponding price data was observed). This is similar to how meteorological services forecast weather, providing a forecast for every day.

Figure 2a shows the forecasted supply and demand pressure for IAG from Jul 1, 2020 to Sep 29, 2020. Demand is considered to be associated with an increased probability of institutional capital being allocated to IAG, while supply is associated with reallocation of capital from IAG to other securities.

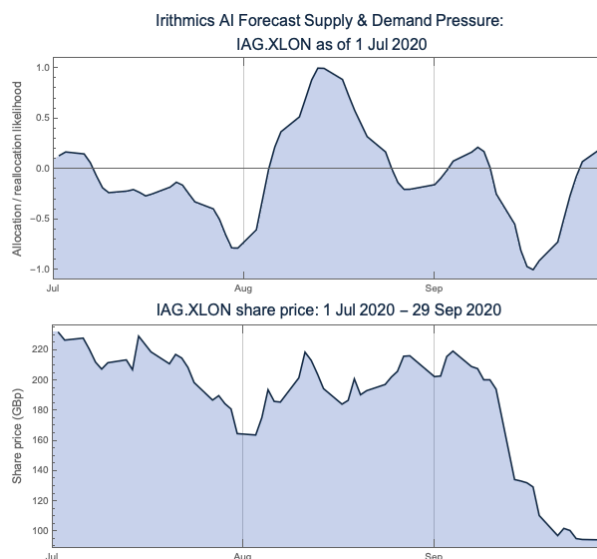
These forecasts show anticipated reduced demand associated with isomorphic institutional strategy reallocation of capital:

- throughout Jul 2020
- briefly towards the end of Aug 2020, and
- from early Sep 2020.

Similarly, the forecasts anticipate increased demand and reduced supply:

- early Aug 2020
- briefly in early Sept 2020, and
- late Sept 2020.

Figure 2b shows IAG share price over the same period.



Figures 2a and 2b: Irithmics AI Supply and Demand Pressure for IAG on 1 Jul 2020

## Summary

The Barclays and IAG case studies are useful, illustrative examples of Irithmics' deep neural network's ability to decode institutional investment strategies and anticipate how these might affect future investor demand. Both examples illustrate how ex-ante supply and demand forecasts reveal informative synergies with subsequently observed market activity, providing ex-ante analysis into market fluctuations arising from institutional strategy isomorphism. However, there are a number of more subtle features which not only suggest how corporates can enhance the allocations they're likely to receive from investors, but also how activists are more likely to leverage shareholder support and initiate a change in institutional strategies towards companies. This latter point has significant implications for activist investors, environmental and social movement campaigners.

Anticipating future supply and demand pressure has numerous tangible benefits, facilitating:

- investors and corporates to better understand institutional investment strategies
- investors and corporates to evaluate the impact and disruption of salient extrinsic factors on institutional investors (e.g., Covid-19 pandemic)
- risk managers to quantify portfolio risk arising from the market behaviour of other investors
- regulators and stock exchanges to monitor market activity and volatility, detecting anomalies in behaviour and allocation patterns.

## About Irithmics

Irithmics' award-winning artificial intelligence technology provides listed corporates, asset managers, stock exchanges and regulators with analytics and insights into global capital markets. Irithmics' AI enhances effective measurement, monitoring and anticipation of investor behaviours and dynamics.

Visit [www.irithmics.com](http://www.irithmics.com) to learn more about Irithmics AI's supply and demand pressure analytics, data and our data feeds.

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