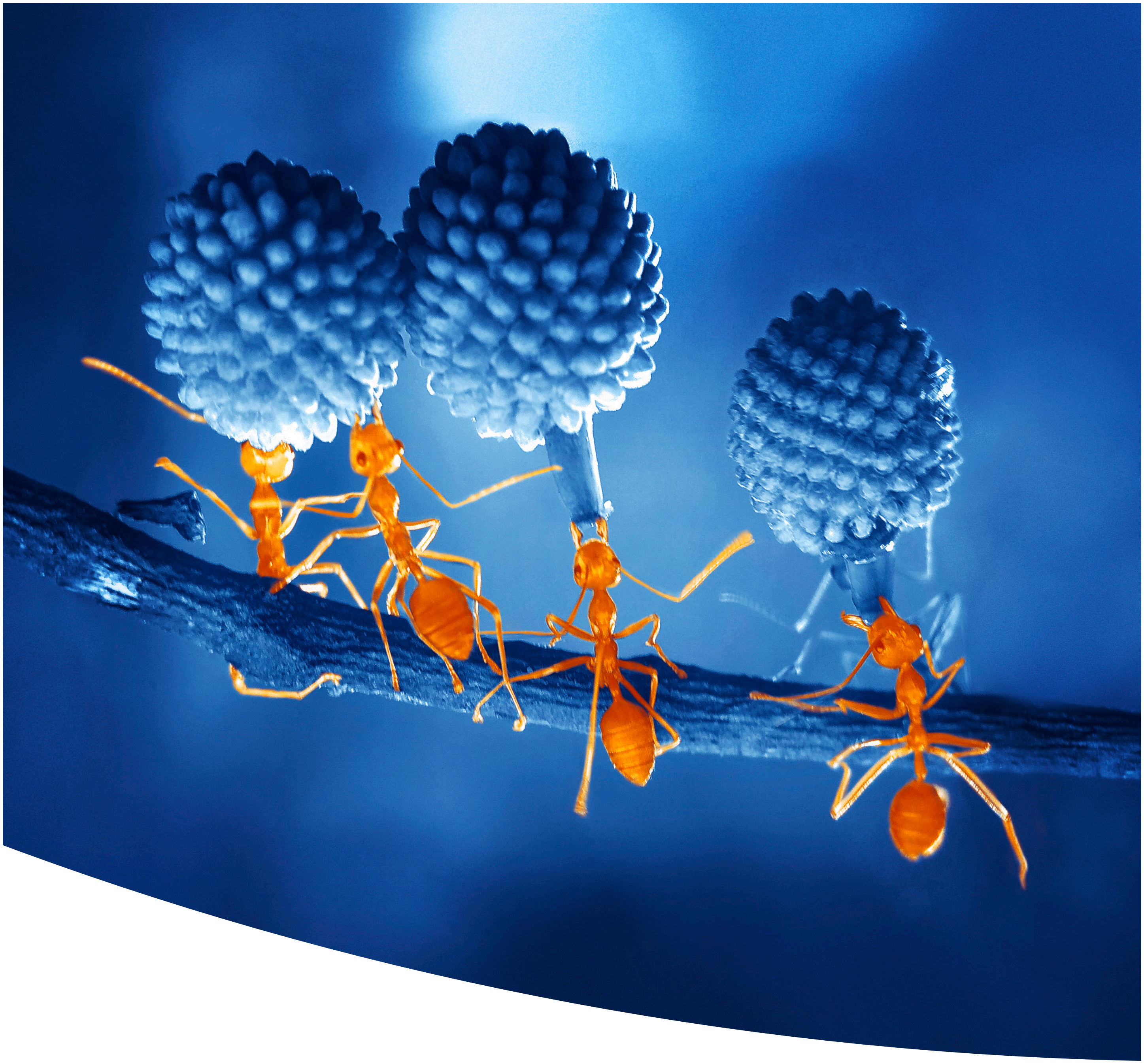


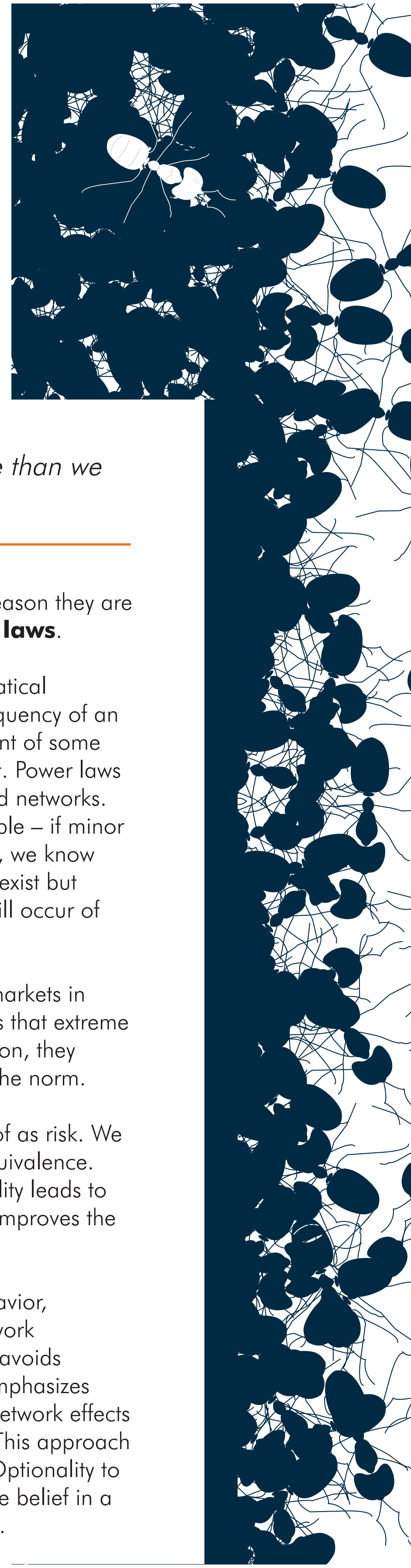
RESILIENCE + OPTIONALITY

An investment philosophy on 'complexity investing' from NZS Capital

The full version of this investment philosophy is available from nzscapital.com. NZS Capital and Jupiter Asset Management formed a strategic partnership in December 2019. Jupiter provides operations and risk management support along with exclusive global distribution.

JUPITER ASSET MANAGEMENT

EXTREME EVENTS ARE NORMAL, **SO EMBRACE THEM!**



Behavioural science tells us that humans are much worse at predicting the future than we think we are, and we're ***especially bad at forecasting extreme events.***

There are many reasons for this, one of which is that we tend to think about the future in terms of a bell curve, with over 99.7% of outcomes in a three standard deviation range of the centre.

Bell curves are great for forecasting systems in equilibrium, **but terrible for making predictions in complex adaptive systems such as the real world and financial markets.**

Complex systems exhibit emergent properties and are incredibly sensitive to small changes – for this reason they are best explained by **power laws**.

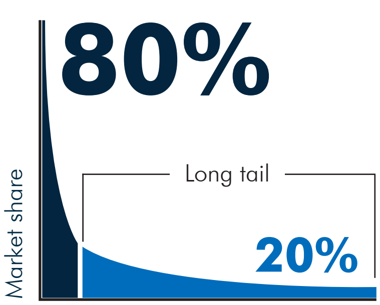
A power law is a mathematical relationship where the frequency of an event varies as an exponent of some characteristic of that event. Power laws are common in nature and networks. Earthquakes are an example – if minor earthquakes are common, we know that massive earthquakes exist but never exactly when they will occur of how big they will be.

Understanding financial markets in terms of power laws tell us that extreme events are not only common, they should be anticipated as the norm.

Volatility is often thought of as risk. We question that assumed equivalence. In complex systems, volatility leads to emergent behaviour that improves the system over time.

Given this power law behavior, we propose a new framework for capital allocation that avoids narrow predictions and emphasizes adaptability, innovation, network effects and duration of growth. This approach balances Resilience and Optionality to avoid pitfalls from the false belief in a normally distributed world.

FIGURE 1: POWER LAW.
In a world of disruption, only a few winners prevail.



Every sector is challenged by disruption.

Today, disruption is most often found in the technology sector. But that's just the start.

In a world of disruption, a few winners take most. Power law distributions prevail.

Investing in a world shaped by disruption requires a new approach. A new investment framework.

RESILIENCE AND **OPTIONALITY**

We embrace volatility and focus on allocating capital to companies that can thrive in a complex environment. To do so they require two characteristics which we describe as ***Resilience and Optionality.***

Balancing Resilience and Optionality allows us to remain agnostic about the various paths that the future might take.

To the extent that we make predictions about the future they are broad ("Cloud computing will be a much larger sector in five years than it is today") rather than narrow ("Company X will grow revenue by 15% in the next quarter").

Learn from ants – they're lazier than you think

The relentless pursuit of productivity at the expense of resilience has been the dominant business philosophy for decades. Consider "Just In Time" inventory when shocks disrupt the supply chain.

Ants are often considered the epitome of industriousness and diligence in the animal kingdom, yet the surprising truth is that most of the time half the colony is just sitting around doing nothing! A consultant would have a field day with that – isn't it a huge waste of resources? In fact, ants have adapted to be resilient to extreme events. If a flash flood kills those out harvesting, or an animal damages part of the colony, then there are plenty of ants in reserves to stage a recovery. Ants have survived millions of years by NOT sacrificing resilience in favour of productivity.

Translating that to business, resilient companies are those that are less optimised on maximising short-term returns and more focused on their ability to adapt and evolve to changing conditions, surviving and even capitalising upon extreme events.

Optionality refers to a large potential payoff resulting from a relatively small investment – it's how the power laws mentioned earlier can work in our favour. Power laws are no secret to venture capitalists, they know that many of their investments will amount to nothing and they only need a small number of winners to make the portfolio successful.

For startups and disruptive businesses, the uncertainty may be too great to feel confident about outcomes for specific investments, but holding many companies with a high degree of optionality should produce several losers and a few outsized winners.

ZEN AND THE ART OF PORTFOLIO MANAGEMENT

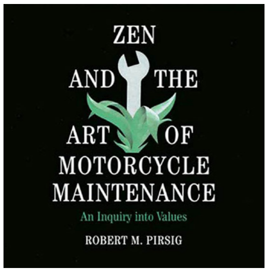
Quality, Growth and Context

We have several key tools to assess businesses and trends that are likely to survive and flourish in a complex system, so we can populate our portfolios with an optimal balance of Resilience and Optionality. These attributes are centred around three areas: ***Quality, Growth and Context****.*

QUALITY: YOU KNOW IT WHEN YOU SEE IT

"What I mean (and everybody else means) by the word 'quality' cannot be broken down into subjects and predicates. This is not because Quality is so mysterious, but because Quality is so simple, immediate and direct."

So wrote Robert M. Pirsig in *Zen and the Art of Motorcycle Maintenance*, and it's a philosophy that sums up our own view on quality when it comes to businesses. For us, the essence of a quality business comes down to its management team and structure.



Long-term thinking and adaptability are two sides of the same coin, as often a successful company will balance a focus on what will NOT change for their business with a strong ability to anticipate the evolving needs of customers. This is something the best management teams understand intuitively.

We like finding businesses that combine Resilience and Optionality. They will likely have certain products or services that can be optimised for Resilience, and these recurring revenue, high cash generative business units should be used to fund a series of Optionality investments around the business's core or adjacent competencies.

IN SEARCH OF 'NON-ZERO-SUM' GROWTH

In a complex world with increasing interdependencies, the best outcome for all players is to make decisions that create positive non-zero-sum (NZS) scenarios, win-win situations that leave both parties better off than if they had not transacted in the first place.

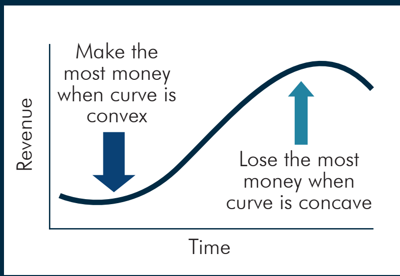
A company that operates a platform focused on creating value for all participants, including itself, is creating large amounts of NZS. The optimal win-win situation is achieved when the platform creates more value for the ecosystem than it does for the company's own treasury. Companies disrupting large established markets can do so by offering all constituents higher NZS than the incumbents and changing the rules of the game. NZS goes far beyond ESG. NZS accounts for customers, employees, society, the environment and investors.

Duration of growth

When evaluating growth, we believe duration rather than pace is the most important consideration. Fast growth is certainly sexy, but can be extremely dangerous to a company's long-term health. Rather, we argue that slow long-duration growth is what the market serially undervalues.

Also, when assessing where a company might be on its growth s-curve, we must take into

FIGURE 2: GROWTH TENDS TO FOLLOW AN S-CURVE.
In a world of disruption, only a few winners prevail.



account the market valuation and what predictions that valuation is asking us to make about the future. Importantly, we must also consider in what ways those predictions are fragile.

CONTEXT: UNDERSTANDING CHANGE

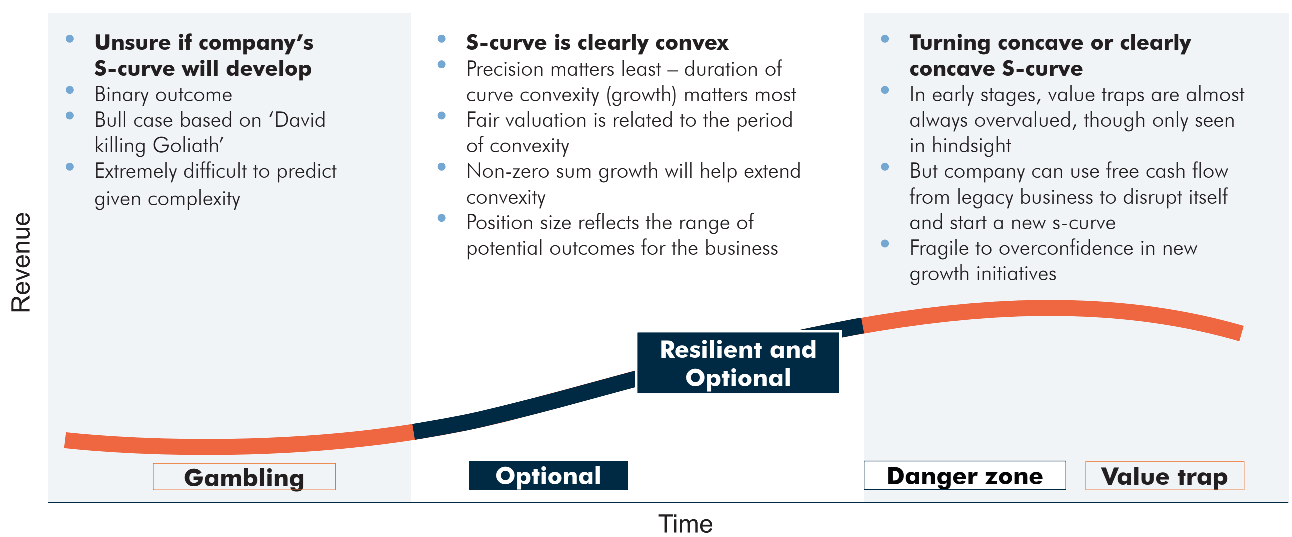
When selecting investments, we do not want the overall portfolio to be fragile to a particular view of the future. This context is key, since even the best management teams can't sell more buggy whips in a world being overtaken by engines.

As such, much of our research is directed toward understanding what is going on within the ecosystems we invest in. Like Amazon, we focus on determining what will change and what will NOT change.

These are the sort of broad predictions we mentioned in an earlier section. Yet the rest of the market is making predictions all the time, and that is reflected in stock valuations. Higher valuations require more narrow predictions and offer multiple ways to lose, and only a narrow path to win. In such cases, even if the company itself is a resilient underlying business, its stock price could be highly fragile to disappointing Wall Street.

Amazon is the poster child for long-term thinking and adaptability. It's a highly experimental company that reacts quickly to changing trends, but its business model is founded on a consistent long-term truth: that whatever else changes in the world, people will always want cheaper products, more selection and faster delivery.

FIGURE 3: S-CURVE.



A NEW FRAMEWORK FOR COMPETITIVE ADVANTAGE

An important aspect of Resilience and Optionality business characteristics is ***a new way of thinking about competitive advantage****. Traditionally, this has been defined in terms of structural barriers to entry or "moats", but in the modern world we view these as an anachronism, a legacy of a world in which information did not flow freely.*

Within a few years, most of the world's population will have access to a smart phone and access to the world's information in their pockets. In an age of instant and complete information, artificial "moats" as described by frameworks such as **Porter's Five Forces become crippling vulnerabilities and, as such, are being destroyed one by one**. Companies that are overconfident in their own competitive advantage are most at risk from disruption, failing to see that the needs of their market are evolving. The antidote to this is innovation, and the entire focus of a company should be on constant innovation and adaptation, disrupting their own core products and not just sustaining them.

Classically, high switching costs are viewed as a barrier to disruption from substitute services, but today, as almost every product or service is increasingly dependent on information, ***switching costs are largely in decline****. Instead, a successful modern business should assume low or zero switching costs and make up for it in providing increasing amounts of value to customers.*

PORTFOLIO CONSTRUCTION FOR THE COMPLEX WORLD

The previous pages outline what we believe are the winning characteristics of companies navigating the disruptive shift from analog to digital. Identifying such companies is only part of the story, of course, and our goal is to thoughtfully construct an adaptable portfolio of companies. In a complex world, basing investment decisions around a narrow prediction of future events is dangerous. Instead we focus capital allocation decisions on balancing Resilience and Optionality.

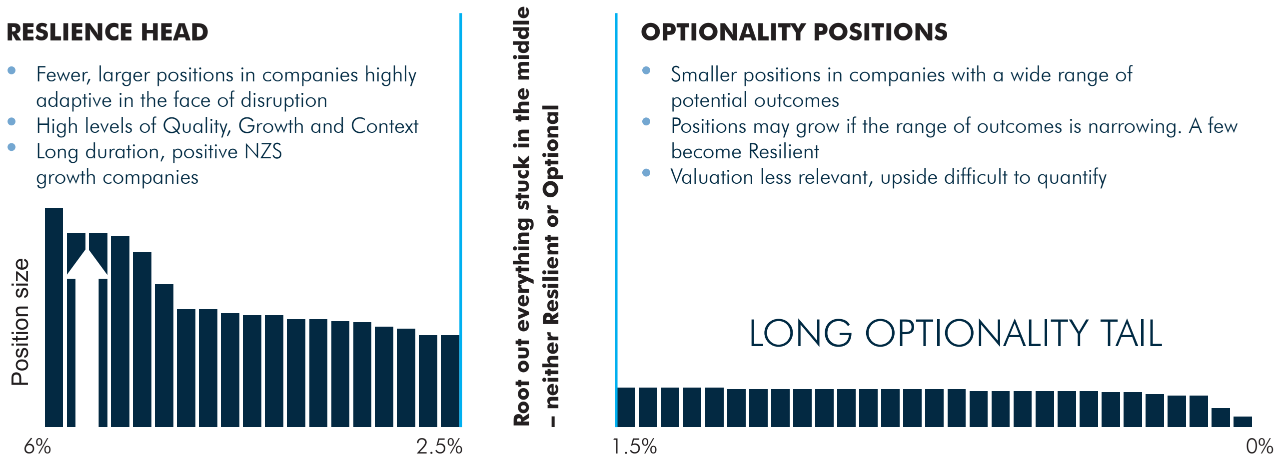
USING A BARBELL TO SQUEEZE THE MIDDLE

A portfolio that balances Resilience and Optionality is a barbell, with the majority of weight in companies that combine both Resilience and Optionality, and the remainder in a diversified selection of small investments that maximise Optionality.

An important part of this strategy is to squeeze out the "middle" position sizes, which in our experience are more likely to be market performers and take away from potential long-term alpha.

Because this strategy does not attempt to optimize risk/reward, it allows us to not be victims of cognitive bias that proves so erosive to long-term performance.

FIGURE 4: PORTFOLIO CONSTRUCTION. Creating a bifurcated portfolio of Resilience and Optionality.



MITIGATING BEHAVIOURAL MISTAKES

Lengthening the tail of the portfolio: The 'endowment effect' is people's flawed subconscious belief that something they own is worth more than something they don't. We minimize this error by extending the number of positions in the tail of the portfolio.

Trimming back optional names: We keep pure Optionality positions below a maximum weighting threshold and harvest excess returns as they appreciate. Because of their sizable upside potential, Optionality positions often drift to the top of a portfolio. If the manager's view of the future is not correct, this may turn into a fatal mistake. Position size is always matched to the range of outcomes.

Vigilant assessment of business risk: By maintaining an open, honest discussion on the business risk of Resilient names, it becomes easier for us to challenge stocks that could be Value traps. Along these lines, perhaps the most dangerous investor behavior is mistaking 'commitment' for 'conviction', which can lead to behavioral mistakes such as confirmation bias, or doubling down on an investment when what you should really do is walk away.

DON'T JUST DO SOMETHING...SIT THERE!

Mindfulness is the disciplined act of paying attention. Just paying attention sounds simple, but millions of years of evolution have wired human brains to work against us in this high-stakes fast-paced modern world that bombards us with stimuli.

We think the framework of seeking Resilience and Optionality through Quality, Growth and Context can help inoculate us against dangerous biases. We allocate our time – our mental energy – like we allocate capital, allowing space to connect dots without distractions.

Complex systems should teach us to stop trying to predict narrow outcomes, to expect extreme events and focus solely on what is either Resilient or Optional. Starting points matter! If we acknowledge Complexity Investing, we end up with a very different way to allocate capital. We believe this framework is well-suited to helping clients meet investment objectives across a wide range of future outcomes in a world with increasing disruption.

If you would like to know more about Complexity Investing, we encourage you to download the paper from www.nzscapital.com/news/complexity. **The team at NZS Capital would welcome an opportunity to share further thoughts and ideas with like-minded investors.**

NZS Capital, LLC

JUPITER
ASSET MANAGEMENT