

TIC JOURNAL

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TÉCNICO INVESTMENT CLUB

WHERE ENGINEERS TALK FINANCE



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SOUTHEAST ASIA: AN EMERGING MARKET IN FOCUS



By Carolina Albuquerque

Characterization of the Region

The Southeast Asia (SEA) region is made up of 11 nations, that include: Brunei, Cambodia, Indonesia, Vietnam, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor Leste, and Laos. The region is located strategically at the crossroads of the most active trade routes in the world and economically links up East Asia, South Asia and the Pacific. The area is rich in historical and cultural admixture as a result of centuries of trade, migration and colonial laws and policies. SEA's demographic evolution has also created a population that gives a wide range of ethnicity, language and religions, such as Islam, Buddhism, Christianity, and Hinduism. This diversity adds to the dynamism of the society and the economy. Furthermore, the region is also integrated by the Association of Southeast Asian Nations (ASEAN) that seeks to promote economic, political and socio-cultural. Popular megacities – in the region such as Jakarta, Bangkok and Manila are among the world’s fastest growing and serve as the centre of economic and cultural activities.



By Santiago Pinto

Investment Opportunities

Southeast Asia has established itself as a key destination for international investment, driven by dynamic economies, sectoral diversity, and strategic advantages. The region presents significant opportunities across sectors such as manufacturing, technology, agriculture, tourism, and energy, while aligning with global trends in digital transformation and energy transition.

Manufacturing remains a cornerstone of the region's economies, with countries like Vietnam, Thailand, and Indonesia playing pivotal roles in the global supply chain. High-tech companies such as Samsung and Intel have set up operations in these countries, drawn by competitive production costs and the ability to meet large-scale demands. In agriculture, Southeast Asia holds a leading position globally, excelling in the export of palm oil, rice, and coffee, supported by abundant natural resources and a tropical climate.

The technology sector is also expanding rapidly. Singapore has become a financial and innovation hub, while Vietnam and Indonesia have

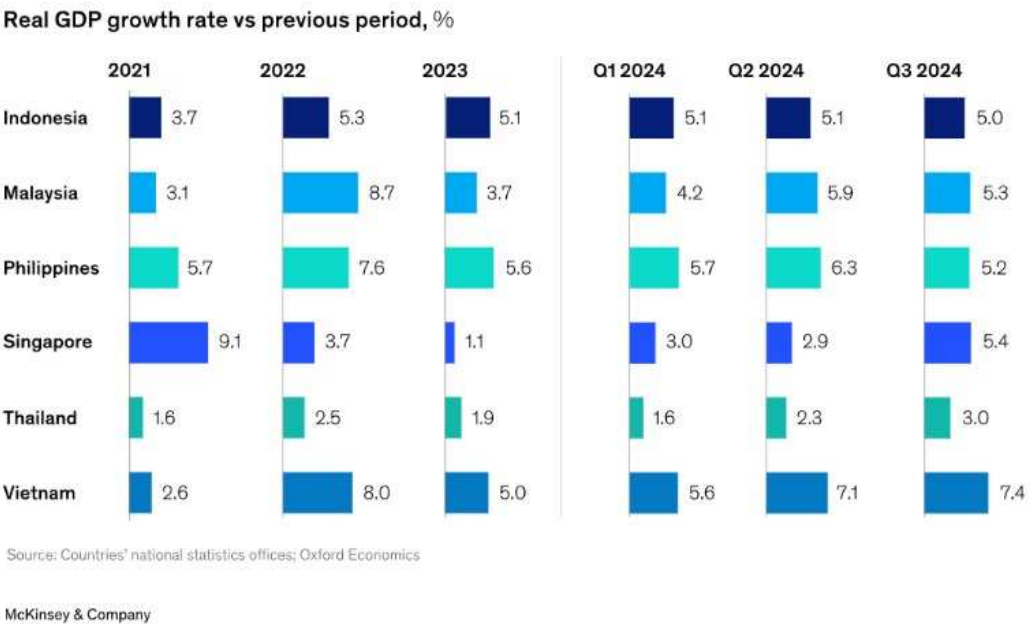
emerged as centres for startups, particularly in fintech, e-commerce, and automation. At the same time, tourism remains a vital source of revenue, with destinations such as Thailand and the Philippines attracting millions of visitors annually.

The region’s competitive advantages extend beyond low production costs. Its strategic location, at the crossroads of major trade routes, bolsters its global relevance. Additionally, countries such as Indonesia possess absolute advantages, including vast reserves of nickel, a critical material for electric vehicle batteries. This has attracted significant investments from global leaders in clean technology. Southeast Asia is also distinguished by its swift adaptation to global demands. The energy transition has spurred investment in renewables, such as solar and wind power, particularly in Vietnam and the Philippines. Concurrently, digital transformation is reshaping local economies, with robust initiatives in artificial intelligence and big data led by Singapore and Thailand.

GDP Q3 2024

Although the third quarter of 2024 showed a varied economic performance across Southeast Asia, the region maintained strong GDP growth overall, largely driven by robust exports and investments. Vietnam's economy expanded impressively, achieving 7.4% growth, marking its third-highest quarterly increase in five years. Singapore also demonstrated notable progress, with GDP growth reaching 5.4 percent, the highest since 2022 and a significant rise from 2.9% in the previous quarter. Thailand experienced a similar trend, with its economic growth gaining momentum. Malaysia, while growing at a slightly slower pace of 5.3%, delivered a solid performance supported by steady exports, investments, and consumption. This follows an exceptional second-quarter growth of 5.9%, one of Malaysia's best results in three years.

Conversely, Indonesia faced its second consecutive quarter of slowed growth, primarily due to stagnant consumption, a critical economic driver. Meanwhile, the Philippines saw its growth rate dip to 5.2%, the lowest in five quarters, as export activity experienced a temporary decline.



Political and Legal Context

The political environment of Southeast Asia has multiple systems, such as constitutional monarchies like Thailand and Malaysia, socialist republics such as Vietnam and Laos, and democratic systems like those of Indonesia and the Philippines. This diversity presents both opportunities and problems regarding governance in the region. The ASEAN framework is an important instrument in establishing peace, stability, and economic cooperation among member states, making it possible for them to deal with geopolitical challenges arising from this diversity. However, there are also governance issues such as corruption, inconsistencies in regulations,

and political instability within some areas that hinder such governance.

Infrastructure and International Relations

Infrastructure development plays a crucial role in Southeast Asia’s economic strategy, focusing on improving connectivity and enhancing competitiveness. There are substantial investments in transportation networks, including high-speed rail systems, upgraded airports, and expanded seaports, all of which support both domestic travel and international trade. The region is also rapidly advancing its digital infrastructure, with the rollout of 5G networks,

increased broadband access, and the creation of data centres to bolster the growing digital economy.

Conclusion

Southeast Asia's status as an emerging market is supported by dynamic economies, a strategic location, and a youthful population. While challenges exist, the region's commitment to integration, innovation, and sustainable growth positions it as a vital player in the global economy. By leveraging strengths and addressing vulnerabilities, SEA has the potential to become a leading hub of economic activity and cultural exchange in the 21st century.

TRUMP'S IMPACT ON M&A LANDSCAPE



By Vasco Filipe



By Afonso Bento

Political leadership plays a pivotal role in shaping mergers and acquisitions (M&A) by influencing regulatory frameworks, economic policies, and market conditions. The **Trump administration** will significantly impact M&A activity through corporate **tax reforms** that increased liquidity for deal-making and deregulation that eases compliance burdens, fostering a more favorable environment for transactions. However, heightened antitrust scrutiny and stricter foreign investment reviews, especially in sensitive sectors like technology and defense, will impose new challenges for many deals. Additionally, protectionist trade policies and tariff impositions may disrupt global supply chains, complicating cross-border M&A. These shifts highlight the intricate ways political decisions can reshape the incentives, risks, and strategies underlying corporate consolidation.

Past Lessons from Trump’s Last Mandate

During Donald Trump’s presidency (2017–2021), his administration exerted a nuanced and multifaceted influence on mergers and acquisitions (M&A),

characterized by the interplay of pro-business reforms and heightened regulatory oversight. The **2017 Tax Cuts and Jobs Act** served as a catalyst for M&A activity, reducing corporate tax rates and facilitating the repatriation of overseas earnings, thereby enhancing corporate liquidity and incentivizing transactions. Concurrently, deregulatory measures, particularly in sectors such as energy and financial services, reduced compliance burdens and further stimulated deal-making.

However, the administration’s protectionist trade policies, including the imposition of tariffs and the escalation of trade tensions, introduced significant uncertainty into global supply chains, complicating cross-border transactions. Stricter oversight of foreign investment through the **Committee on Foreign Investment in the United States (CFIUS)** imposed additional barriers, particularly in sensitive industries such as technology and critical infrastructure. Moreover, selective enforcement of antitrust regulations underscored an approach that, while not uniformly restrictive, demonstrated a willingness to challenge high-profile mergers deemed to pose competitive risks. These policies collectively underscore the intricate ways in which the Trump administration shaped the M&A landscape, fostering domestic activity while imposing new complexities on international transactions.

Outlook: What to expect

With the Republicans now having full control of Congress, Trump’s policies could bring back certain trends regarding deal activity, having his election win been greeted with optimism by U.S. dealmakers. **Lower corporate taxes** and potential deregulation would most likely **boost domestic consolidation**, particularly in industries like energy and manufacturing. A return to protectionist trade policies, such as tariffs and stricter scrutiny on foreign acquisitions, could dampen cross-border deal flow. Key industries to watch include Energy, where favorable policies for fossil fuels may drive upstream and midstream M&A activity, and Technology, where increased scrutiny on **Chinese investments might** reduce inbound tech deals but **encourage bets on AI businesses and digital assets**. Regarding these, Trump administration would likely give AI companies the opportunity to self-regulate themselves while at the same time controlling the

inflow of foreign big techs. Additionally, a more lenient view on monopolistic concerns could boost large-scale mergers.

About Worldwide

In response to the shifts in mergers and acquisitions dynamics influenced by Donald Trump’s presidency, global leaders have strategically adapted their policies, particularly in the areas of foreign investment, trade, and regional economic realignment. Many countries have followed the U.S. example in strengthening foreign investment review mechanisms, especially in critical sectors such as technology and defense. For instance, the European Union implemented a foreign investment screening framework in 2020, and countries like Germany, France, and Italy have introduced stricter regulations. Similarly, nations in the Asia-Pacific region, including Australia and Japan, have enhanced investment restrictions in response to growing geopolitical concerns, particularly regarding Chinese acquisitions.

In reaction to U.S. protectionist measures, China has sought to deepen regional trade relations, notably through agreements such as the **Regional Comprehensive Economic Partnership (RCEP)**, while European leaders have emphasized "strategic autonomy" by fostering intra-EU M&A activity to create stronger regional players. In emerging markets, particularly in Southeast Asia, Latin America, and Africa, governments have positioned themselves as viable alternatives to disrupted supply chains, stimulating both regional investment and M&A activity.

Furthermore, countries like India have pursued non-alignment strategies to balance relationships with major global powers, enhancing their appeal to international investors. The Middle East, through initiatives such as the **Gulf Cooperation Council (GCC)**, has leveraged sovereign wealth funds to promote M&A, particularly in energy and technology sectors. As digital sovereignty becomes increasingly important, European and Asian leaders have introduced regulations to protect critical infrastructure and emerging technologies, reshaping M&A in sectors like artificial intelligence and semiconductors.

These developments underscore a shift toward more localized regulatory

frameworks and regional economic consolidation, reflecting the increasingly complex and cautious global M&A environment. Looking to the future, the global M&A landscape is likely to continue evolving under the influence of these strategic shifts. As geopolitical tensions persist and regulatory scrutiny intensifies, companies may increasingly focus on domestic consolidation and regional deals to mitigate risks. **Cross-border M&A could become more selective, with countries adopting even stricter foreign investment reviews, particularly in high-tech and sensitive industries.** Emerging markets are expected to play an increasingly central role in global deal-making, as firms seek new growth opportunities outside traditional markets. In addition, as digital sovereignty and data security remain high priorities, we can anticipate greater regulatory oversight of M&A in technology sectors, particularly in artificial intelligence and cybersecurity. Overall, the future of global M&A will be shaped by a complex interplay of political, economic, and regulatory factors, requiring companies to navigate a more fragmented and cautious environment.

Conclusion

Trump’s presidency reshaped the M&A landscape, fostering a more business-friendly domestic environment while complicating cross-border transactions. His policies underscored the interplay between political leadership and corporate strategy.

As we look to the future, a potential return of Trump or similar policies could bring both opportunities and risks for dealmakers. Companies must remain agile, balancing optimism from domestic incentives with caution over international complexities. Understanding these dynamics is critical for navigating the evolving M&A markets.



EU ETS WHAT IT IS AND HOW IT WORKS



By Nicolau Conim

The EU’s Emissions Trading System (ETS) is a market-based approach to reducing greenhouse gas emissions. It operates through a cap-and-trade framework, where emission caps are set for each industry, and pollution permits are allocated or sold to companies. These companies can trade permits annually to align with their actual emissions, ensuring reductions occur where costs are lowest. Complementing this, the **Carbon Border Adjustment Mechanism (CBAM)** imposes taxes on high-emission goods imported into the EU, discouraging businesses from relocating to regions with less stringent climate regulations.

emissions. Industries at risk of carbon leakage, where businesses might relocate to regions with more lenient regulation, receive a portion of their pollution permits for free. Industries at risk of carbon leakage, where businesses might relocate to regions with more lenient regulation, receive a portion of their pollution permits for free. However, most permits are auctioned, generating revenue that supports the climate transition. Throughout the year, companies can trade these permits, ensuring that emissions are reduced where costs are lowest. At the end of the year, companies must verify their emissions and surrender the corresponding permits, ensuring compliance with the system.



By Tomás Brogueira

The carbon caps are reduced annually, with restrictions progressively tightened over multi-year phases. Each phase introduces new policies, such as incorporating additional sectors into the legislation, aiming to make the carbon transition more inclusive for all industries.

Phase 4 of the ETS, currently in effect, follows an annual process designed to drive emission reductions. Each year, **the EU adjusts the emission cap for each industry, reducing it by 2.2% to progressively lower the total allowable**

Decarbonization Opportunities and Challenges in the European Automotive Sector

The European automotive sector faces significant challenges and opportunities in light of the EU’s decarbonization strategies. A McKinsey & Company study on a European automotive company found that **its profits could decline by 20% to 40% over the next decade.** Half of these losses would stem from direct costs associated with the CBAM, while the

remainder would result from reduced demand as customers shift toward lower-emission products.

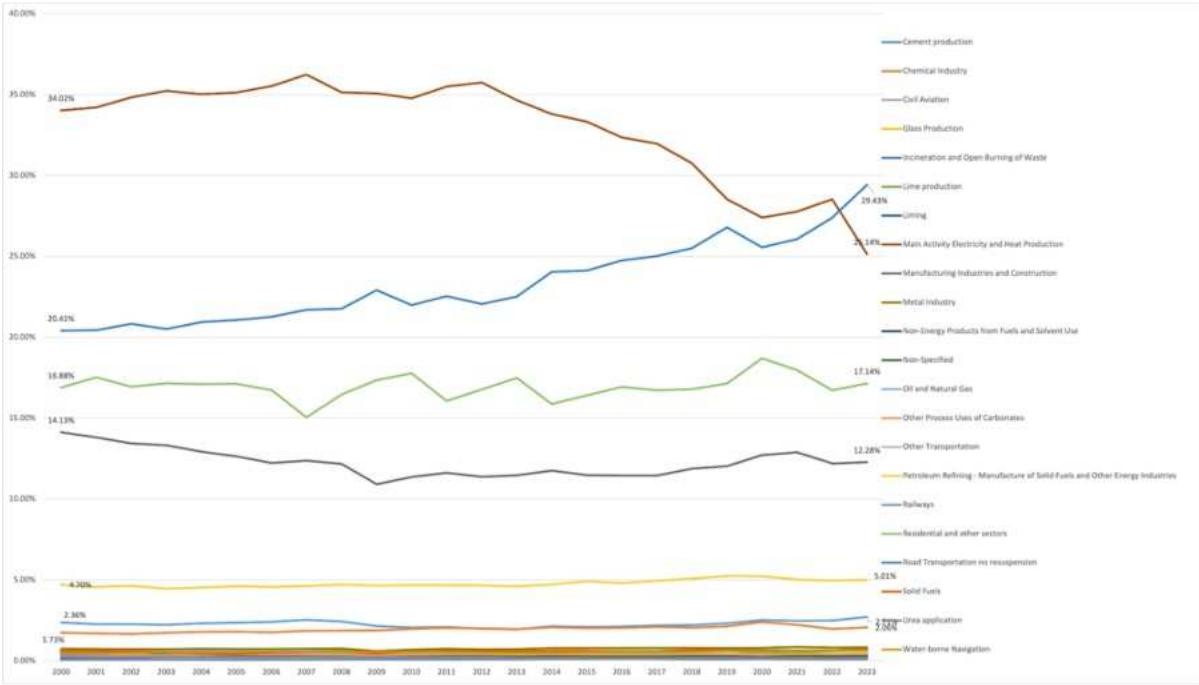
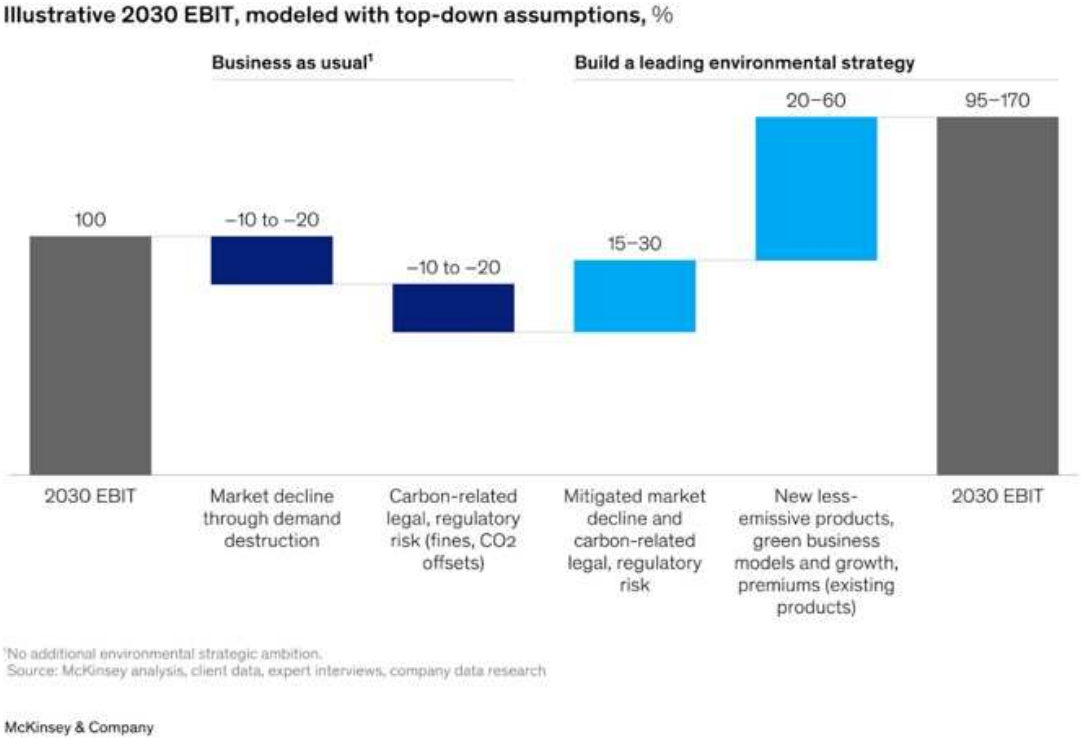
However, adopting decarbonization strategies presents significant opportunities. Companies that transition toward sustainability gain a long-term competitive edge. By reducing their carbon footprint across the supply chain, through material substitutions, waste reduction, or energy efficiency, companies can lower both the carbon taxes from the ETS and CBAM and direct costs associated with energy, water, and wasted resources. For European companies, **these strategies could increase Earnings Before Interest and Taxes (EBIT) by 15% to 50% by 2030** as evidenced by the following McKinsey study:

The CBAM plays a crucial role in this transition, aligning business operations and promoting sustainable practices. Companies that lead in transitioning their value chains to greener alternatives will not only comply with regulatory requirements but also position themselves to capture emerging opportunities.

Focus on the Transport Sector

The following graph shows the percentage of carbon emission from each sector in the EU:

As we can see the transport sector, specifically **"Energy/Transport/Road Transportation"**, is a key area poised for growth in the decarbonization transition. This broad category includes cars, light-duty trucks, heavy-duty trucks and buses, and motorcycles. With significant emissions reduction targets, this sector has **ample carbon credits available**, creating a strong financial incentive for innovation. Companies that prioritize sustainability and invest in reducing emissions across these vehicle types will be well-aligned with evolving regulations.



As a result, businesses that **invest in sustainable technologies—such as electric vehicles, hydrogen fuel alternatives, and more efficient transportation systems**—will be well-positioned to thrive. These investments not only reduce exposure to carbon taxes but also create opportunities for market leadership.

In this context, the transport sector stands out as a critical area for regulatory alignment and investment. Companies that adopt green technologies and reduce their carbon footprint will gain a competitive edge in the long term, positioning themselves as leaders in a low-carbon economy.

THE HURST EXPONENT: A GATEWAY TO UNDERSTANDING TIME SERIES DYNAMICS



By Luís Granja

Historical Context

The origins of the Hurst Exponent trace back to the work of the British hydrologist **Harold Edwin Hurst** (1880–1978). While studying 800 years of records of the Nile's flooding he noticed an intriguing pattern – a high flood year was often followed by another, and similarly, low flood years tended to occur consecutively. To investigate whether these patterns were purely random or exhibited some degree of correlation, Hurst developed **the Rescaled Range Analysis (R/S) method**. Hurst's work laid the foundation for modern fractal and long-memory analysis in time series, extending far beyond its original hydrological applications.

Understanding the Metric - Theoretical Foundations

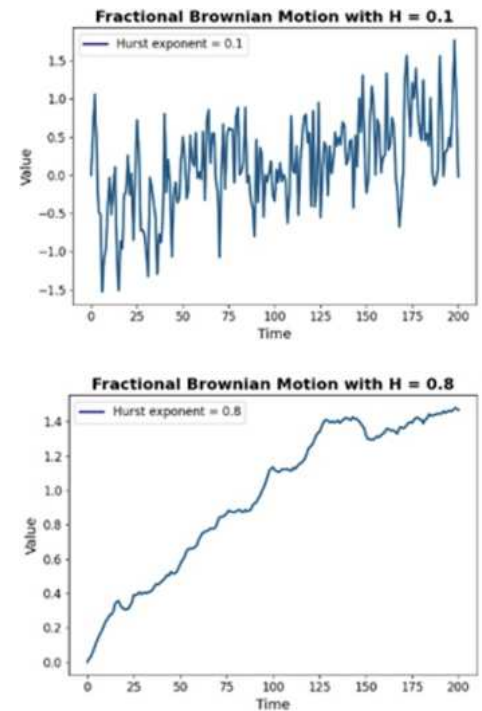
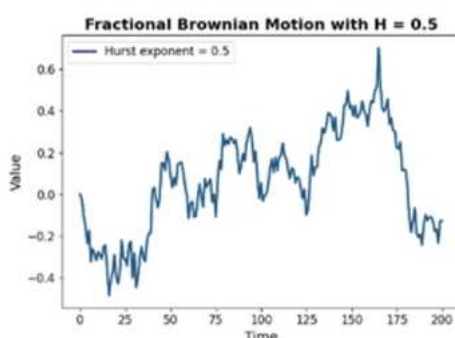
The Hurst Exponent is derived from the **scaling relationship between the rescaled range (R/S) and the time period n**:

Here, **R(n)** represents the cumulative deviation of returns from the mean, **S(n)** denotes the standard deviation of the series, **H** represents the Hurst exponent and **n** the number of data points.

The probability theorist **William Feller** proved that if a series of random variables has finite standard deviation and is independent, then the (R/S) would increase proportionally to :

$$\frac{R(n)}{S(n)} \sim k * n^{0.5}$$

As described previously, if the (R/S) statistic increases proportionally to with **H>0.5**, this indicates signs of persistent behavior, meaning that **a positive return is more likely to be followed by another positive return**. In contrast, if **H<0.5** it suggests anti-persistent behavior, where a **positive return is more likely to be followed by a negative return**. These findings get more evident when analyzing the following three plots:



The first one, characterized by a Hurst exponent of 0.5, represents a random walk. This is evidenced by its **irregular pattern and the absence of a discernible trend**, indicating a lack of autocorrelation.

Conversely, the second graph, with a Hurst exponent of 0.1, manifests **anti-persistent or mean-reverting behavior**, where increases are typically followed by decreases.

In contrast, the third graph, with a Hurst exponent of 0.8, displays persistent behavior, suggesting, as stated before, that **an increase in one period is likely to be followed by further increases in subsequent periods**.

Estimating the Hurst Exponent

The process begins by dividing the time series into smaller segments of varying lengths. For each segment, the cumulative deviation from the mean is computed, representing the **aggregate fluctuations of the data**. This cumulative deviation is then rescaled by dividing it by the standard deviation of the segment, producing the **rescaled range (R/S)**.

After calculating the rescaled range for all segment lengths, the relationship between the rescaled range and the segment length is analyzed on a logarithmic scale. Specifically, a log-log plot is created, with the logarithm of the rescaled range plotted against the logarithm of the segment length. Linear regression is then applied to determine the slope of the resulting line, which corresponds to the Hurst exponent.

All things considered, the Hurst exponent offers a **robust quantitative**

The **Hurst Exponent (H)** is a powerful statistical metric used to evaluate the nature of time series data. Originally developed to analyze the Nile's floods level, it has since become increasingly important in fields such as finance and physics for identifying patterns in data. The Hurst Exponent **quantifies the persistence or anti-persistence of a series** by examining its autocorrelation structure, determining whether the series is:

- **Trending** ($H > 0.5$) - Indicative of momentum;
- **Random walk-like** ($H=0.5$) - Brownian Motion;
- **Mean-reverting** ($H<0.5$) – Anti-persistent Behavior.

The **Portfolio Optimization team** uses the Hurst Exponent to extract valuable insights for strategy development. Specifically, it is applied in the design of trend-following and mean-reverting investment strategies, as it will be discussed further.



By Guilherme Oliveira

framework for analyzing the memory and scaling properties of time series, providing valuable tools for enhancing portfolio optimization strategies. Moreover, this analysis directly relates to the **Efficient Market Hypothesis (EMH)**, which suggests that asset prices follow a random walk and lack memory.

However, some evidence often contradicts the weak-form of the EMH. When the Hurst exponent deviates significantly from the 0.5 mark, it can reveal two distinct market regimes, trending or mean-reverting, as shown previously. These deviations challenge the assumptions of the weak-form EMH, highlighting the opportunities to explore patterns in financial markets.

Even though identifying these distinct market regimes establishes a foundation for further signal generation, this alone is not sufficient to execute trading strategies. Hence, to refine signal generation, complementary indicators must be employed.

Hurst in Portfolio Management

One such indicator is the **Bollinger Bands**, a widely used tool for assessing short-term price movements and potential entry and exit points. The Bollinger Bands consist of three lines: **a moving average in the middle and two outer bands representing multiples of the standard deviation from the average**. These dynamic thresholds **reflect the asset's recent price range** and act as indicators of whether the asset is overbought or oversold.

In this sense, one of the ways to generate buy and sell signals for mean-reverting assets is based on the **price interaction with these thresholds**, so buy signals are triggered when the price lies below the lower Bollinger band, and sell signals occur when the price exceeds the upper band. For example, an asset with $H < 0.45$, indicating anti-persistent behaviour, presents a long opportunity when its price falls below the lower band, as it is expected to revert toward the mean.

Conversely, trending assets can be approached using a variety of strategies, ranging from the crossover between long and short-moving averages to methodologies based on momentum. By leveraging the momentum-based strategy, buy signals are triggered when the momentum is positive and above a certain threshold, while sell signals are generated when the momentum is negative and below the threshold.

Once signals are generated, their strength — determined by the magnitude of the momentum or the degree of deviation from the Bollinger Bands — guides the allocation process, defining the target weights for each asset.

Building on this foundation, the next step involves optimizing the effective weights for each asset. This optimization process considers the **transaction costs and rebalancing constraints**, aiming to achieve the optimal allocation that aligns with the target weights while ensuring that the rebalancing process becomes economically efficient, avoiding excessive

trading that could compromise returns.

Associating the Hurst exponent with portfolio management highlights one of its broader applications in finance. By leveraging the market regimes classification derived from the Hurst exponent for each asset, it **becomes possible to automate the rebalancing of the assets' contribution within a portfolio**.

Conclusion

Based on this analysis, the **Portfolio Optimization team** is well-positioned to leverage the insights gained from the Hurst exponent and complementary indicators. By integrating these tools, the team can effectively classify market regimes, refine signal generation, and implement dynamic asset allocation strategies. This approach not only **enhances the adaptability of portfolios to varying market conditions but also ensures more informed decision-making**, aligning with the ultimate goal of maximizing returns while managing risks efficiently.



CHAMPIONS OF THE 5² CHALLENGE 2024



By Tiago Portugal

This November, our team had the incredible privilege of participating in the 5² Challenge, organized by BNP Paribas Portugal’s Global Markets Front Office. Competing against finance clubs from Portugal's top universities – NOVA SBE, ISCTE, ISEG, FEP, and our own TIC representing Instituto Superior Técnico – we proudly secured first place, a remarkable achievement in this prestigious competition!

As students from an engineering university, this competition was a unique and invaluable opportunity to step into the world of finance. Over five days, our team – Tiago Portugal, Luís Granja, João Martins, Tomás Juhos, and Filipe Carneiro – faced dynamic challenges that ranged from designing structured financial products to simulating the fast-paced operations of a trading floor. These tasks pushed us to showcase our technical expertise, analytical abilities, and exceptional teamwork under pressure.

We are deeply grateful to BNP Paribas for organizing this enriching competition, which allowed us to test our skills, expand our knowledge of finance, and connect with industry leaders.

This outstanding achievement not only highlights the dedication and excellence of our team but also showcases the potential of Técnico students to thrive in interdisciplinary fields like finance.



A Letter from the President and Vice-President

Dear **TIC** and **IST Community**,

As we conclude this semester, we are proud to reflect on an incredible period of growth, achievement, and transformation for Técnico Investment Club. Hence, we wanted to take a moment to express our gratitude for your continued trust and support in the board's leadership.

One of the highlights of this semester was winning 1st place in the 5² BNP Paribas Finance Club Competition. Competing against some of the brightest teams in the country, our members demonstrated exceptional work and expertise that defines TIC. This victory not only underscores the caliber of talent but also raises the profile of Técnico Investment Club.

Additionally, we marked a historic milestone by transitioning from a club to an independent association. This change reflects our growth over the years, granting us more autonomy, resources, and opportunities to expand our impact within IST and beyond. It is a step that positions TIC for continued success, enabling us to serve our members better and pursue even more ambitious goals in the future.

As we celebrate these accomplishments, we look forward to fostering excellence, creating new opportunities for learning and growth this next semester, and keeping the spirit that defines TIC. Thank you for being an integral part of this journey and for contributing to the success of the community that we continue to build together.

Thank you to all the members of the TIC community for reaching this far. We look forward to meeting you soon.

Sincerely,

João Le Coroller, **President**

João Filipe, **Vice-President**



Thank you