BEYOND CLIMATE 1: BRINGING IT ALL BACK HOME

"Code red for humanity" screamed the headlines as CISI members gathered for our first – and spectacularly-timed – live version of this magazine's Ask the Experts column, focusing on responsible investment (see article at *cisi.org/ate-responsible*). Code red? The United Nations' Intergovernmental Panel on Climate Change (IPCC), which assesses the science related to climate change, had just published an unequivocal report, *Climate Change 2021*, its first in more than a decade, laying the fault firmly at the door of humanity. But didn't we already know that?

Since the creation of the IPCC in 1988, its volunteer scientists from around the world have been tasked with producing periodic assessments of the state of climate change. Its first *Climate Change* report in 1991 finds, in effect, that human activities are increasing greenhouse gas concentrations, and that rises in levels of these will result in greater warming of the Earth's surface. The second report, *Climate Change 1995,* linked the two by saying there is "a discernible human influence on the global climate".

The third report, *Climate Change 2001*, started shifting the blame in our direction: "There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." The fourth report, *Climate Change 2007*, firmed up on that conclusion: "Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations." By 2013, the fifth report held it "extremely likely" that humans are the main problem. By August 2021, that human-climate link is "unequivocal". Our own experts (p.61) discussed the issues this raise for clients – and thus for our sector.

This issue of *Review of Financial Markets* also dives into the lessons from the Asian financial crisis of 1995-98, confusion in money laundering risks around Europe, and more cheerily the prospects of bringing smart grids to bear on issues around power distribution – and climate change.

George Littlejohn MCSI
Senior adviser, CISI
Editor, Review of Financial Markets
george.littlejohn@cisi.org

Nigel Pantling, Chartered FCSI, our poet-in-residence opens the celebrations for the CISI's 30th anniversary in February 2022 with a peek at the past.

Lost to God and Mammon

In memory of twelve City firms and twelve City churches

St Ewin
St Messel
St Quilter
St Hambro

St Antholin
St Benet Fink
St James Capel
St Laurence Prust
St Strauss Turnbull
St James Duke's Place

St Peter Le Poer
St John Zachary
St Robert Fleming
St Bisgood Bishop
St Wedd Durlacher
St Michael Le Querne
St Laurence Pountney

St Leopold Joseph
St Nicholas Acons
St Martin Pomeroy
St Samuel Montagu
St Charterhouse Japhet
St Christopher le Stocks
St Swithin London Stone

BEYOND CLIMATE 2: SERVING GROWING CLIENT DEMAND IN CLIMATE'S OTHER CHALLENGES

ASK THE EXPERTS GOES LIVE: GETTING TO GRIPS WITH RESPONSIBLE INVESTMENT

I was privileged to sit through the panels producing the Climate Risk Certificate just launched by the CISI and our colleagues at the Chartered Banker Institute and Chartered Insurance Institute. In these, it became more apparent as the months went by that the many impacts of the climate challenge and attempts to mitigate it remain uncertain. Scientists are inevitably more conservative even than accountants or actuaries in our sector, but as so often in life, probabilities are the best way to paint true climate pictures. Despite hundreds of years of scientific work, how all of the variables that make weather patterns and ecosystems interact is simply too complex for even the most advanced model or computer to predict infallibly.

For the moment, though, the scientists have done their job, and the task at hand is for financiers to do theirs. It has become clear in recent months as the clamour for climate action has grown in the build-up to COP26 in November 2021 that investment clients – both individual and institutional – are moving ahead, and have become more attuned to impact issues, both in their home countries and globally, particularly around the other UN sustainable development goals (SDGs). These encompass areas like health, education, agriculture, renewables, transportation and others.

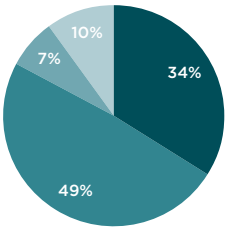
At a special 'Ask the experts goes live: Getting to grips with responsible investment' session on CISI TV in August 2021, we polled the substantial member audience on this theme, of tradeable impact vehicles, and others. The results show how SDG issues beyond climate will loom yet larger on all our agendas over the coming months and years.

On our expert team we had Kate Capocci, Chartered MCSI, investment manager and lead ESG specialist, Smith & Williamson; Will Hobbs, chief investment officer, Barclays Wealth & Investments; Abi Reilly, managing consultant, Bovill; and Nigel Sydenham, Chartered FCSI, CCL Academy, and chair, CISI Training, Competence & Culture Committee.

The programme is available on MyCISI at *cisi.org/ate-responsible*

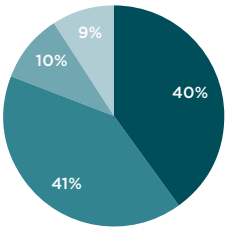
George Littlejohn

THE RESPONSIBLE INVESTMENT VIEWS OF CISI MEMBERS



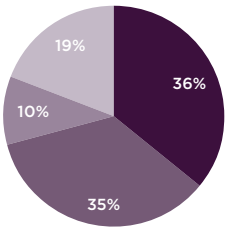
Will the recent* unequivocal UN report on the climate crisis have come as a shock to the majority of your firm's clients?

- No – they are already very aware of the crisis
- Yes – most are unaware of the scale of the crisis
- To some degree – it will have increased their awareness
- I don't know how our clients will have responded



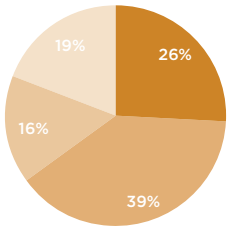
Will the report have come as a shock to colleagues in wealth management?

- No – they are already very aware of the crisis
- Yes – most are unaware of the scale of the crisis
- To some degree – it will have increased their awareness
- I don't know how wealth managers will have responded



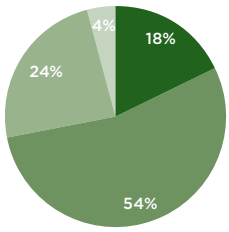
How would you describe your firm's current arrangements for training staff on ESG and related issues?

- It currently has no specific training in place for this issue
- It has a comprehensive ESG training programme in place
- Some staff have received training on ESG
- I don't know whether my firm provides any ESG training



The climate challenge is just one of the UN's sustainable development goals. There is evidence that interest is growing amongst clients for investment opportunities covering some of the other goals – such as those on health, education, agriculture and renewables. Has your firm experienced demand from clients for tradeable impact investments?

- Very little - client interest is rare
- Significant – many clients are interested
- Moderate – some clients are expressing interest
- I don't know



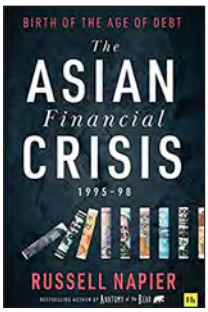
Regulation is a bigger challenge in responsible investment – ESG and the like – than many have anticipated. On a scale of 1 to 4, how would you describe your current level of knowledge of the law and regulation governing this area?

- None/very low
- Good
- Limited
- Comprehensive

*Source: CISI webcast Ask the experts live: Getting to grips with responsible investment on 11 August 2021. *Report refers to the IPCC report published on 9 August – see main text.*

THE BIRTH OF THE AGE OF DEBT

LESSONS FOR THE INVESTMENT WORLD FROM THE ASIAN FINANCIAL CRISIS OF 1995–98



Professor Russell Napier has been an adviser on asset allocation to global investment institutions for over 25 years. His latest book, *The Asian Financial Crisis 1995–98*, published in July 2021 (and from which the following two extracts are taken) on the lessons from the Asian financial crisis of the late 1990s, brings those dramatic years – and the lessons for today's generation of financiers – to vivid life. Andy Haldane, lately chief economist at the Bank of England, says of the book: "The Asian financial crises marked the dawn of a new strain of highly virulent crisis that would, in time, come to afflict every advanced economy in the world. This lucid book offers a forensic and compelling account of its source, contours and consequences."

Russell is also author of *Anatomy of the bear: Lessons from Wall Street's four great bottoms* and Keeper of the Library of Mistakes, a business and financial history library based in Edinburgh. He has founded and runs a course called 'A Practical History of Financial Markets' and an online marketplace (ERIC) for the sale of high-quality investment research to institutions. Russell is chair of the Mid Wynd International Investment Trust.

Russell is a keynote speaker at our Global Wealth Summit on Thu 11 November 2021

The end of the so-called Asian economic miracle and the events of the Asian financial crisis [of 1995-98] were about much more than money. They were about a conflict between very different societies fought on the battleground of capital markets. It was the first major battle in a war that continues to this day and will shape the rest of the 21st century. It is a war that was instigated by a Thatcher/Reagan revolution that launched a new form of capitalism that sought to change the world, armed with excessive amounts of debt, in pursuit of profit. While initially it looked like an old form of what might be called laissez-faire capitalism, it very quickly became a new form of capitalism probably best labelled financial capitalism. It was a form of capitalism that combined individualism with the aggressive use of balance sheet management for primarily personal profit. As early as 1983, Michael Milken was helping corporate America supercharge returns through the issuance of a record amount of speculative credit instruments known as junk bonds. The particular beneficiaries of this form of financial engineering were corporate management and incentives were soon put in place, primarily in the form of stock options, to incentivise such behaviour. The world has seen speculative corporate debt binges before, but this one was launched in a period when interest rates had just begun a decline that would last 40 years. The heady mix of ever cheaper debt combined with ever more stock options incentivised corporate management to export financial capitalism to the world. A simple narrative developed that it would sweep all before it.

The rise of financial capitalism occurred as the Berlin Wall fell and communism collapsed. It was widely assumed that the rest of the world would adapt to a capitalist system and the new financial capitalism found itself with a seeming myriad of opportunities for profit and, it was argued, only weak competition. The fact that many stock markets across the world, closed primarily by communist regimes, had reopened was one signal that the change to a more capitalist structure was underway. However, these were dangerous surface signals because in many societies the new form of capitalism spreading from the US was incompatible with local societal beliefs and structures. Each society in Asia was different in its own way, but in north Asia in particular there was a much more communal approach to societal organisation that could not and has not been reconciled with financial capitalism. This book charts the battle between the new financial capitalism and the various other forms of capitalism that existed then and still exist across Asia.

The Asian financial crisis was for many a victory for financial capitalism over the various forms of Asian capitalism. This book explains why in fact there was no such victory. Asian capitalism adapted but fundamentally did not change. In north Asia in particular their form of social capitalism was strengthened by the confrontation in 1998 that left them with significantly undervalued exchange rates and benefiting from the new debt-charged consumption growth of the developed world. The Asian financial crisis set the scene for an age of debt in the developed world and this brought crises that have forced developed governments to confront financial capitalism in their own backyards. The result is that the age of financial capitalism is ending and something more akin to the social capitalism of Asia is being created.

// THE ASIAN FINANCIAL CRISIS WAS FOR MANY A VICTORY FOR FINANCIAL CAPITALISM OVER THE VARIOUS FORMS OF ASIAN CAPITALISM //

The book looks at that battle fought in the capital markets in Asia in 1998 and explains how a seemingly lost battle set the scene for the dangerous overextension of financial capitalism. In that overextension, financial capitalism reached extremes that led to financial collapse and societal repercussions that were ultimately unacceptable to both peoples and their political representatives. When the history of the 21st century is written, it begins with the Asian financial crisis of 1998, which created global financial conditions that created the age of debt and triggered a structural shift to a new form of social capitalism in the developed world. The repercussions from events in Asia in 1998 have been and will be much wider than merely financial.

The Asian Financial Crisis 1995–98 is published by Harriman House. Russell Napier appears regularly on *CISI TV*.

PRAISE FOR *THE ASIAN FINANCIAL CRISIS 1995–98*

The Asian financial crises marked the dawn of a new strain of highly virulent crisis that would, in time, come to afflict every advanced economy in the world. This lucid book offers a forensic and compelling account of its source, contours and consequences.

Andy Haldane, Chief economist at the Bank of England

A combination of applied and highly practical economics that through reality bridges the gap between policy theory and actual implications and results, but more it is also a travelogue and a diary.

Richard Chenevix-Trench, Former CIO of Sloane Robinson

The Asian crisis was a remarkable learning experience for everyone in finance. This blow-by-blow account is an important reminder of what we learned and the hard way we learned it.

Lord Davies, of Abersoch Ex Standard Chartered and previously Minister for Trade and Small Business

A detailed retrospective on the development and evolution of the Asian Crisis drawn from the contemporaneous notes of a keen observer of economic and financial history … interesting food for thought for investors and policymakers alike.

Terrence Checki, former executive vice president and head of emerging markets and international affairs, Federal Reserve Bank of New York

THE IMPORTANCE OF FINANCIAL HISTORY

WHAT HAPPENS WHEN BOOM TURNS TO BUST? WHY THE PAST MATTERS

An understanding of financial history is … a key tool in understanding how credit cycles peak and the consequences of that peak and then decline. With degrees in law and no formal qualifications in economics, business or finance, I had found that I could learn a lot about financial markets from reading financial history.

It struck me as curious then, and still does today, that so few professional investors know how financial markets have behaved in the past when faced with some of the stimuli they expect them to be impacted by in the future. I'm not sure that it is an approach to understanding cause and effect that would be tolerated in other professions, but it is a very pervasive approach in investment.

Many investors were at sea when, boom, the only thing most had known in Asia turned to bust. There was plenty of guidance as to what would probably happen, but it was all hidden in history books and not economic textbooks. Few thought those history books could be a guide to the 'modern' investor, but they were to prove to be one of the best guides we had.

As the years progressed, I came to rely more upon financial history as a guide to the financial future and in 2004 established a course in financial history for professional investors, A Practical History of Financial Markets,[1] at the Edinburgh Business School in Scotland. Although this book covers the period from 1995 to 1998, you will find many references to periods in financial history before then that I believe proved useful in assessing the financial future. This book now serves as another guide on how to spot an over-exuberant credit cycle, how to work out when it is ending, and what to do when it does.

Investment is not a physical science, but a pursuit to establish price by human beings who bring key psychological biases to the endeavour. The importance of those biases waxes and wanes, but at some although not all times, they become overwhelmingly important. The history of those periods, when these psychological biases overwhelm the rational mind, are essential reading for any investor and the story of the boom and bust in Asia, from 1995 to 1998, is one of those periods. …

The prices of financial assets are replete with opinions about the future, and historians looking from "the other side of the hill" often miss the key determinants of price for those guessing what they don't know based on what they do know. For the financial market historian, there is thus great value in the study of the contemporaneous opinion of those pricing financial assets. Like the Iron Duke, they sought "to endeavour to find out what you don't know by what you do", and in that pursuit they regularly failed. The common failures in such pursuits are worthy of study and this book attempts to study such failure – in this case largely my own.

[1] *This course qualifies for some 27 hours of CISI CPD. See CISI events pages for details.*

THE VIEW FROM THE REAR OF THE KOALA

THERE'S NO MONEY LEFT ... THE CONSEQUENCES OF RUNNING OUT OF MONEY

In developments strongly echoed in Asia in the summer of 2021, the final quarter of 1997 brought a severe cash crunch. In the words of the book, "not a penny was to be found". The story opens on 8 October 1997, when the Ministry of Finance of the government of Indonesia called the International Monetary Fund. This country of almost 200 million people had run out of money. "It was not the only country in Asia that was suddenly on the verge of bankruptcy. A financial feast had turned to famine in just a few months."

The consequences of running out of money transcended finance and economics. By May 1998 in Indonesia, over 1,000 people had been killed in riots and President Suharto's 31-year tenure was over.

It was no ordinary recession that brought such chaos to Asia. In the Asian financial crisis the decline in gross domestic product (GDP) per capita, measured in US dollar terms, was of a huge magnitude: Indonesia -56%, South Korea -34%, Malaysia -30% and Thailand -27%. Investors who sold billions of US dollars and other currencies to buy Indonesian equities lost 90% of the value of their investment, in US dollar terms, in little over a year. Losses in other regional stock markets may not have been as bad, but they were still eye-watering declines in the US dollar value of investments: Hong Kong -58%, Malaysia -87%, the Philippines -78%, Singapore -59%, South Korea -71%, Taiwan -36% and Thailand -89%.

Savers had invested to benefit from the famed Asian economic miracle. They got the notorious Asian financial crisis. This is the story of that crisis, but not a history of it. It is told primarily through the writings of someone who was there at the time and who was trying to assess the economic and financial outlook both before and then through the chaos. It is a story of what it is like, as an investor, to live through one of the largest ever financial crises without the benefit of knowing where and when it will end.

In learning the investment lessons from that crisis, the mistakes in forecasting the future you will find in this story are probably more important than the successes. They are my mistakes – your author.

THE SO-CALLED ASIAN ECONOMIC MIRACLE TURNED CRISIS

I was enfranchised to make these mistakes as I was, at the age of 30, hired to advise global equity investors on where and where not to invest in Asia. As the Asian Equity Strategist for one of Asia's largest stockbroking companies, I lived through and chronicled this economic miracle that became a crisis.

I landed in Hong Kong in May 1995 to join the wild party in financial markets that was a key part of the so-called Asian economic miracle, but by the time I left in September 1998, much of the region was on financial life support provided by the IMF and the crisis looked like it could trigger a global depression. In just over two years, what was widely admired and praised as an economic miracle had turned into what is now widely known as the Asian financial crisis. Portfolio investors and commercial bankers lost hundreds of billions of US dollars in little more than a year.

The collapse threatened the solvency of the global financial system, bankrupted Russia and brought devaluation and economic chaos to Brazil. It also did something that was to prove even more destructive, as it created, in its aftermath, the conditions that were to fuel one of the biggest debt booms in global history – a debt boom that in 2021 continues on its destructive course.

It all began in the rear end of a koala. For three and a half years I chronicled the end of a boom and then the storm of the Asian financial crisis from the 33rd floor of what was then called the Lippo Centre in Admiralty, Hong Kong. The two-towered building had been built by Australian entrepreneur Alan Bond. The Bond Centre, as it was originally called, was completed in 1988 when Alan Bond was at the zenith of his success. Bond was a proud Australian, though born in England, and he had the two towers designed in the shape of trees, each complete with a series of climbing koalas. My office was in the rear end of one of those koalas hanging out over Admiralty with a view across Hong Kong harbour to Tsim Sha Tsui. On a clear day, of which there were increasingly few, you could see the hills of the New Territories. China was not visible but, because of the pollution, you could often smell it.

// THE MISTAKES IN FORECASTING THE FUTURE IN THIS STORY ARE PROBABLY MORE IMPORTANT THAN THE SUCCESSES //

The rear of this particular koala had its own warning about the perils of assuming that enterprise funded with excessive debt is an enterprise built upon firm foundations. Alan Bond went

spectacularly bankrupt just a few years after the Bond Centre was completed. This was not the only casualty associated with the Bond Centre. After Bond's demise, the building became the Lippo Centre and the Lippo Group of Indonesia was almost mortally wounded in the Asian financial crisis.

Of the two towers of the building, one was named the Peregrine Tower after the stockbroking company that was to be one of the more high-profile casualties of the Asian financial crisis. Local Feng Shui experts suggested that it was the shape of the glass koala that brought such bad luck to those that were associated with this building. Perhaps they were right, but during the time I occupied the rear of the koala, there was little good luck to be had anywhere in Asia.

My job in Hong Kong was to write papers advising professional investors on which of the many Asian equity markets to invest in and which to avoid. The View from the Rear of the Koala would have been a striking title for these writings, but perhaps too outrageous even for my famously irreverent employer, CLSA. Instead, I settled on something much more prosaic for these musings with two words from a song called 'Northern Muse' written by Van Morrison. The writings you will find reproduced in the book, mainly written in the low light of an early Hong Kong morning, are as they hit the press from 1995 to 1998, published under the banner of The Solid Ground. From the outset, I saw the irony in that title as there is no such thing as anything solid in forecasting the future – financial future or otherwise. That is both the curse of those who try to forecast and also the appeal of the pursuit to the enquiring mind.

Fortunately, the job of an investor or their adviser is not to accurately forecast the future, but to forecast it more accurately than the consensus. These writings attempted that task without of course knowing anything about the future.

MISTAKES AND MISCONCEPTIONS IN THE FOG OF WAR

Historians know what happened next and this informs, often wrongly, their interpretation of events and decisions at the time. Misconceptions and mistakes are analysed without any understanding of how reasonable they seemed to those wrapped in their own fog of war. What follows here is a story of those mistakes made in the fog of war and of the major, then prevalent, misconceptions and their role in creating one of the world's worst financial crises.

The content published [in the book] was written from 1995 to 1998 and cannot be described as history because it was written in an attempt to forecast the future. Now that we know that future, we can assess what advice, whether right or wrong, proved of value to those trying to secure positive real returns from their investments in the teeth of one of the world's greatest financial crises. Your author believes that it will be advice that will be helpful for investors still involved in the battle for investment survival.

// IT WAS NO ORDINARY RECESSION THAT BROUGHT SUCH CHAOS TO ASIA //

It was perhaps John Kenneth Galbraith who best described why memories, even perhaps if they are someone else's, are "utilitarian" and can protect us all, at least somewhat, from the "luminous insanity" that sometimes pervades markets:

> The story of the boom and crash of 1929 is worth telling for its own sake. Great drama joined in those months with a luminous insanity. But there is the more sombre purpose. As protection against financial illusion or insanity, memory is far better than law. When memory of the 1929 disaster failed, law and regulation no longer sufficed. For protecting people from the cupidity of others and their own, history is highly utilitarian.
>
> *John Kenneth Galbraith, The Great Crash 1929, Preface to the 1975 edition*

Demonstrators protesting against the government in the financial district of Bangkok after the economic crash of 1997

A CONFUSED AML RISK MANAGEMENT FRAMEWORK HAUNTS EUROPEAN INSTITUTIONS

KAREL LANNOO AND **RICHARD PARLOUR** CONTINUE THEIR ANALYSIS OF THE FAULT LINES IN EUROPEAN ANTI-MONEY LAUNDERING (AML) WORK WITH A PEEK INTO RISK MANAGEMENT WEAKNESSES

Karel Lannoo, CEO of the Centre for European Policy Studies (CEPS), and his co-rapporteur Richard Parlour of Financial Markets Law International, a regular contributor to CISI on financial crime, continue their series on anti-money laundering, drawing on their January 2021 report *Anti-money laundering in the EU: time to get serious*, by CEPS, one of the world's leading think tanks.

Richard Parlour: rp@fmli.co.uk

European Union rules require credit institutions to have governance arrangements in place to ensure sound and effective risk management. Internal control mechanisms should prevent failures, such as money laundering, in the compliance framework. But [in many recent cases there have been] huge deficiencies in putting these frameworks into place. This was analysed in a 2019 European Commission report. It sees weaknesses in the different lines of defence that a bank is recommended by regulators to have in place to counter money laundering. These lines of defence consist of:

1. **The front office:** recognising or reporting suspicious customers and types of transactions.

2. **Risk management and compliance:** ensuring that the front office, at all levels, is duly informed and clear procedures are in place; that units are properly staffed to respond and comply with the rules; that they follow the procedure of submitting suspicious transaction reports to the local financial intelligence units (FIUs); and that senior management is informed and acts in cases of failure.

3. **Internal risk audit:** a unit that controls (1) and (2) independently from management, with a direct reporting line to the audit committee and executives. The internal audit should allow for the raising of a case by a whistleblower, who should be protected in so doing.

For large banking groups, which are thought to be the primary targets for money laundering, though no proper research has been conducted on this, the challenge is to have policies consistently applied at corporate level, in the EU and third countries, in branches and subsidiaries, and in correspondent banking relationships. The variety of organisational models of banks, the degree of integration of control systems in often merged cross-border entities, and diverse administrative requirements and languages, make this problematic for compliance departments. Indeed, large banks are often collections of smaller entities that have been bought out or merged, with little attempt to create a truly single identity or culture, and often with a plethora of legacy systems.

To improve the organisational strength of such entities, regulators need to be more assiduous in ensuring there is a plan, resources, and the will to consummate bank mergers so that they can operate more efficiently and protect themselves better against financial crime. Sadly, this need is usually overlooked. Such policies often clash with commercial and customer onboarding objectives, or create conflict among bank staff. In the case of Danske Bank, for example [see June 2021 issue of Review of Financial Markets (cisi.org/rofmjun21) for a detailed analysis], the laundering happened at the Estonian branch, where employees actively covered up violations, which were insufficiently held in check by headquarters. The information technology system of the branch was not integrated with the rest of the group. The branch fell under the watch of the Danish FSA for prudential matters, but under the Estonian authorities for AML. It seems that the lessons from earlier egregious collapses resulting from unrestrained nefarious and speculative activity, the BCCI and Barings Bank cases of the 1990s, were forgotten.

Auditors: An external audit must ensure that accounts reflect a fair and proper view of the company. Auditors need to check that internal controls are taking place, i.e. that the know your customer (KYC) rules are applied, and that the business is a going concern. Irregularities need to be reported to the authorities. The complexities described above, with different legal frameworks and responsible authorities, render the task of auditors more difficult. EU law harmonised the conditions for statutory audit (regulation EU 537/2014) but left many options to the member states, such as for the provision of non-audit services by auditors. The regulation created a thin structure for EU-wide cooperation, the Committee of European Auditing Oversight Bodies (CEAOB), which is managed by the European Commission. This confusing picture has received scant attention, but further harmonisation will be required to help prevent more cases of money laundering.

At the next stage, there is the role of the government authorities: the supervisory and law enforcement authorities, and the FIUs and tax authorities.

Prudential and conduct supervisory authorities: AML supervision is a task for prudential authorities in most member states, as it is part of the core risk management tasks of a financial institution. Moreover, it can have financial stability implications. Some countries have a specially dedicated entity. The newly formed European Banking Authority (EBA) AML Standing Committee brings together these different bodies, 57 in total, including those of the EEA countries.

The FIUs process suspicious transaction and suspicious activity reports, as well as cash transaction reports in certain countries, and pass these on to law enforcement for action. - Tax authorities can act to pursue tax evasion and counter tax avoidance.

Law enforcement authorities are charged with assimilating the intelligence, assembling evidence and prosecuting cases.

Each of these lines is organised differently across the EU, let alone in the rest of the world, which makes consistent application of AML/CFT (combating financing of terrorism) challenging. Cross-border cases demand strong cooperation among these entities, which is time-consuming, but no AML supervisor appears until recently in charge of supervising groups (although it is explicitly mentioned in the Fourth AML Directive, and now the task of the EBA). Certain international networks, such as the Egmont Group and Moneyval, have come to support these needs to some degree, but this has yet to translate into any significant impact on underlying criminality.

The European Commission detected unease among prudential supervision authorities in using their far-reaching powers against money laundering, "as the prudential framework only exceptionally refers explicitly to such concerns" (EC 2019 report, p. 11). The Single Supervisory Mechanism (SSM) is seen as an additional layer for coordination, but not considered an AML/CFT authority, according to recital 28 of the SSM regulation. The first head of the SSM executive board, Danielle Nouy, often reiterated that AML/CFT supervision is not the SSM's business.

An additional problem is that home-country control, the basis of prudential supervision in the EU, does not apply in relation to AML, where the host country is in charge, as was clear in the Danske Bank case. AML issues were not consistently factored into the review of the credit institutions' prudential framework, it appears, while they may have far-reaching consequences. This also applies at corporate headquarters, where AML/CFT issues are not prominent, according to the EU Commission's 2019 report. The differences in the supervisory architecture for prudential and AML purposes renders cooperation more difficult. The same applies with regard to law enforcement authorities. Hence, the EU is faced with an AML governance spaghetti, in the context of growing cross-border activity and more centralised prudential supervision.

Concerning enforcement, judicial systems and penalties differ widely in the EU, a situation that will not change soon since member states zealously guard these powers.

NEW TECHNOLOGIES AND AML

Over the past five to ten years there has been a drive to create uniformity in vendor systems utilised by the financial sector, with consistent standards, scenario planning and functions. In the same period, there have also been significant developments through enhanced computer power and artificial intelligence, use of blockchain and other technologies, which create opportunities to streamline analysis and reporting, and target risk resources, moving away from traditional, rules-based monitoring to identifying behaviours, network analysis and clustering of risk attributes. As such, there is opportunity for EU financial institutions and non-financial firms to enhance their surveillance mechanisms and focus on effectiveness.

// THERE IS OPPORTUNITY FOR EU FINANCIAL INSTITUTIONS AND NON-FINANCIAL FIRMS TO ENHANCE THEIR SURVEILLANCE MECHANISMS AND FOCUS ON EFFECTIVENESS //

In certain respects, technology has improved both the identification of financial crime and delivery of more actionable information.[1] Data collection and analytical tools have become more powerful, and technology is advancing. The application of blockchain technology to transactions, for example, could allow for better control of them. There is a need for progress across three key dimensions, however:

1. **Data:** The issue is not so much the lack of data (certain databases for use in AML are in bad shape, however) but whether the right data are collected, their quality, the processing power and analytical capability, in order to assess it and use it more effectively. There is a need for more in-depth and relevant data that can be updated dynamically.

2. **Analytics:** With better data, AI and machine learning could be used to develop better models of analysis that allow the carrying out of more complete risk assessments. This will have to be an iterative process, rolling out the best analytical models that provide a view spanning a number of different risks and combining and aggregating data across all sectors and regions. There are many data analysis techniques, though, and the end result will only be as good as the algorithm concerned.

3. **Communication:** The crux of the matter is understanding how to get the right information in a timely manner to the appropriate people to get the correct decision, including providing insight, data and intelligence to law enforcement. That would require an operating model and a framework that are more agile and complex than the ones in use today.

One of the problems with technology is that once a good system is up and running, it may hinder effectiveness or reduce the attractiveness of developing further advanced technology to manage financial crime risks. New technologies may, for example, result in a reduction in the number of suspicious activity reports (SARs) being filed, appearing to present a decline in potential suspicious activity and raw data that will need to be explained to the authorities. AI systems could effectively lock large numbers of innocent people out of financial markets if not implemented and executed correctly. It could also act as a brake on innovation, not just of financial products but of law enforcement and supervision techniques.

[1] *This section is based on a contribution by HSBC to the task force and on the response of a task force member.*

THE FOURTH INDUSTRIAL REVOLUTION: INCUBATE AND BRANCH OUT

PROFESSOR **ALEXANDER VAN DE PUTTE** INTRODUCES OUR LATEST ADDITION TO *LEAPFROGGING SUSTAINABILITY*, TAKING RESPONSIBLE FINANCE (AND THE CLIMATE CHALLENGE) A BIG STEP FORWARD

In March 2021, the CISI published, alongside our friends at the Astana International Financial Centre (AIFC), a free volume for members titled *Leapfrogging sustainability*, which gazes beyond the pandemic and the climate threat. Distinguished contributors - from AIFC itself, the European Bank for Reconstruction and Development, IE Business School in Madrid, and the University of Cambridge, amongst others – probed the frontiers of finance. The book was accompanied by a series of webinars available now on MyCISI:

1. Leapfrogging sustainability: Seven megatrends that are shaping sustainable economic development (May 2021)
2. The circular economy: Extending the competitive advantage period of natural resource-rich countries (May 2021)
3. Financing the sustainable energy transition: The role of financial centres (June 2021)
4. The ultimate endgame: The Eurasia renewable energy internet (June 2021)
5. Leapfrogging sustainability: The role of financial centres to de-risk FDI projects (July 2021)

For more information on the book, please contact george.littlejohn@cisi.org

NOT ALL COUNTRIES ARE EQUALLY ENDOWED WITH RENEWABLE ENERGY RESOURCES

Based on ten billion people, the world's energy capacity (all forms of energy) needs are in the range of 30 to 45 TW or 30,000 to 45,000 large-scale conventional power plants. Without considering that wind and solar are intermittent resources, this would translate into about 10 to 15 million 3 MW windmills or 100 to 150 million 300 W solar panels. Given that the wind does not always blow and that the sun does not always shine, a significantly larger number of intermittent power sources are required. In addition, as will be seen later, efficient electricity storage solutions and smart grids are needed to aggregate the electricity from these intermittent energy resources and ensure that electricity is available when and where it is needed.

The absolute availability of wind and solar resources on earth is not the issue. In fact, there are plenty of renewable energy resources. According to Sandia National Laboratories, wind and solar stand out in particular with 1,000 TW and 89,000 TW of theoretical potential. Even when only the technical potential of wind and solar are considered, they can meet the world energy needs: 14 TW for wind and 7,500 TW for solar.

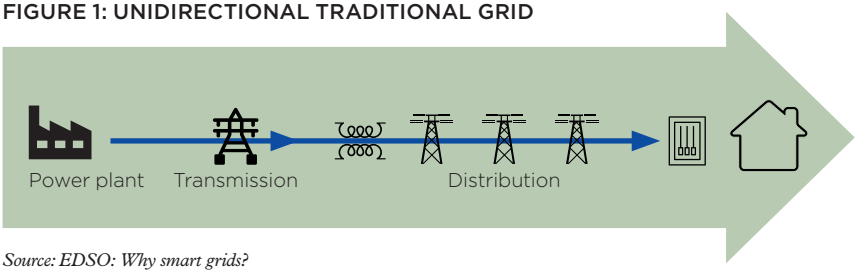
However, not all countries are equally endowed with renewable energy resources. The northern part of Western Europe, Russia, north Kazakhstan, North Africa, Argentina, Australia, China and the central part of North America are good locations for onshore wind. The same countries plus Brazil and most of Western Europe are good locations for offshore wind. Sunbelt countries (most of Africa, the Middle East, India, south Kazakhstan, Australia, parts of the US and Latin America) are suitable for solar. Kazakhstan has some of the largest renewable resources in the world, with enormous potential for wind in the north and solar in the south.

ENERGY GRIDS ARE TOO LOCAL TO ADDRESS THE INTERMITTENCY OF ELECTRIC RENEWABLES

In Europe and the United States, electricity grids have been developed by country, state or at best regions, with limited interconnectivity between them. In a typical centralised power generation environment, large-scale fossil fuel power or nuclear power plants generate electricity, which is transmitted to various substations. A network of lower-voltage transmission lines transmits electricity from the substations to its final point of consumption (Figure 1).

Consider the US electricity grid, for instance. It comprises three regional grids: 1) the Eastern Interconnection, which connects states east of the Rocky Mountains, 2) the Western Interconnection, which connects states west of and including the Rocky Mountains, and 3) the Texas Interconnection, which covers Texas only. The Eastern Interconnection is tied to the Western Interconnection with six high-voltage direct current power transmission lines, and with the Texas Interconnection using two high-voltage direct current transmission lines. Although the three interconnections are tied together with high-voltage direct current power transmission lines, they were really designed as three independent regional grids, and may be unstable when a high degree of intermittent renewable energy comes online. Plans have been made to connect the three regional grids with three 5 GW superconductor high-voltage direct current power transmission lines over the planned Tres Amigas SuperStation. In an electric grid with a high portion of wind and solar, this kind of efficient and fast infrastructure is needed to balance load across the countries.

FIGURE 1: UNIDIRECTIONAL TRADITIONAL GRID



Source: EDSO: Why smart grids?

In June 2020, China's State Grid Corporation announced that it had completed a 1,000-mile (1,587 km) ultra-high voltage (UHV) line to transmit electricity between Qinghai and Gansu provinces to Hehan. The new direct-current UHV line transports electricity at 1,100 kV, with minimal transmission losses, and is part of China's strategy to develop a nation-wide grid as part of its renewable energy internet, which thus-far covers 19 UHV lines covering more than 17,000 miles (27,570 km). China, however, has insufficient indigenous renewable energy potential given population density and its geographic location and would thus benefit from being part of the Eurasia Renewable Energy Internet (EREI), with Kazakhstan as the buckle.

The German Energiewende is a brave but incomplete and expensive way to start moving the country away from fossil fuels. Depending on the weather conditions, wind and solar currently supply between 30% and 90% of Germany's electricity needs. Wind generation in Germany varies widely over both short and longer time periods, and in 2015 varied between 1.5 GW and 35 GW depending on the wind conditions. Germany's strategy to reduce the variability of wind generation is to invest in offshore wind[1] and to use taller windmills with longer blades. However, the challenge of variability is difficult to mitigate and even in Denmark, wind generation falls below 10% of the rated capacity of its total windmill park about 5% of the time.

Germany and Denmark have the highest installed capacity of wind and solar in Europe, but they also tend to have the highest residential electricity prices (about €30 cents/KWh or about 50% higher than the European average). To help address variability and cost issues, a European super grid has been envisioned for many years and would even include North Africa and the Middle East. Northern Europe and the Atlantic coastlines of Europe and North Africa are ideal for wind, Southern Europe for solar photovoltaic and North Africa and the Middle East for concentrated solar power (CSP). Integrated in a smart super grid, Europe, North Africa and the Middle East could theoretically be almost entirely powered using renewable energy sources. Unfortunately, geopolitics and security issues with the 'war on terror' very often hamper creative and sustainable business ideas.

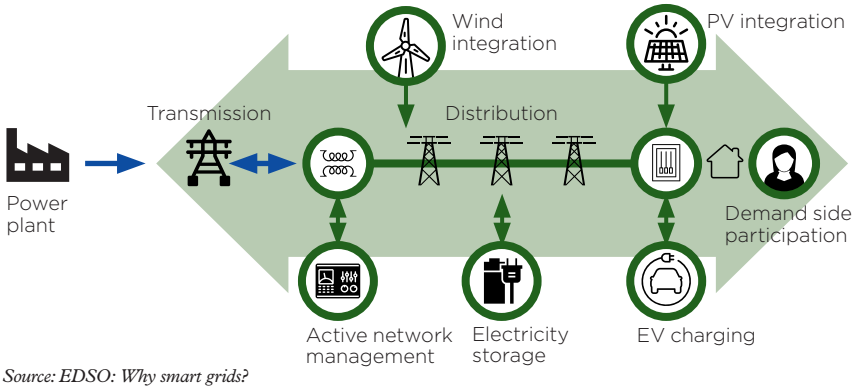
Now that the world is increasingly moving away from fossil fuels towards renewable electricity for heating, cooling, transportation, lighting etc, several regional smart super grids are needed. These smart super grids could be further integrated into a global, largely renewable, energy internet, effectively providing affordable and clean energy where and when it's needed.

// SMART GRIDS SHARE CRITICAL DATA SELECTIVELY WITH OTHER PARTS OF THE GRID //

The only long-term sustainable solution to global energy is to rapidly scale wind and solar in locations where they make most sense from a weather perspective. When evolving from a decentralised to a distributed electricity system, this also implies evolving from a unidirectional traditional grid to a multidirectional smart grid where every node in the grid can become both a consumer and producer of electricity (Figure 2).

To fully appreciate what is needed, let us contrast the conventional electricity grid with the smart electricity grid along the dimensions of a simplified electricity value chain (Table 1, p.70).

FIGURE 2: MULTIDIRECTIONAL SMART GRID



Source: EDSO: Why smart grids?

Smart grids also capture critical data at each part of the value chain and share this data selectively with other parts of the grid. Omnidirectional energy flows in a smart grid require sophisticated balancing software to help balance the electricity supply and demand along the grid, smooth load distribution and maintain grid stability. Smart grids have several advantages over conventional grids. For example, because of the decentralised nature of power generation, electricity bills tend to be lower because consumers sell any unconsumed electricity to the grid. Additionally, smart grids tend to be more robust and more efficient. Thus, if a part of the grid fails then electricity will find another route to supply electricity where it is needed, and disruptions are automatically detected for repair. Finally, smarter homes and real-time information of electricity consumption also tends to increase awareness about energy wastage and has proven to result in lower electricity consumption.

In summary, a smart grid is a network of local, national, regional and global smart grids that connects sources to consumers and includes smart metering, advanced storage (for instance, even an electric car could function as an energy internet storage device for use at night), and software to ensure that energy is available where it is needed.

FROM SMART GRIDS TO SUPER GRIDS THAT TRANSCEND BORDERS

The idea of a Eurasia renewable energy internet where several super grids

[1] *Although the LCOE (levelised cost of electricity) of offshore wind is significantly higher than of onshore wind, offshore wind tends to blow harder and more constantly than onshore wind.*

TABLE 1: CONTRASTING CONVENTIONAL AND SMART GRIDS

Grid type	Electricity production	Electricity transmission & distribution	Electricity consumption
Conventional grid	•Base load power plants (coal-fired, combined cycle gas turbine (CCGT), and nuclear power plants)	• High voltage lines between power plants and grid transformers • Lower voltage lines for local electricity distribution	• Domestic homes • Business offices and commercial centres • Factories • Electric trains
	Unidirectional electricity flow		
Smart grid	• Mix of base load power plants and intermittent renewables • Electric storage complements intermittent renewables	• High voltage lines between power plants and grid transformers • Lower voltage lines for local electricity distribution	• Production of electricity distributed across the grid • Consumers become both producers and consumers
	Multidirectional electricity flow		

Source: Leapfrogging sustainability

would be connected using ultra-high voltage transmission lines, is emerging, and its concept is based on the 'traditional' internet – a network of globally interconnected computer networks that can effectively communicate via an internet protocol. Its origins date back to research conducted by the US government in the 1960s, and in 1989 British computer scientist Tim Berners-Lee invented the world wide web, a standardised system of accessing information via the internet, while working at CERN in Switzerland. With more than 4.5 billion people connected to the internet, it has dramatically changed the way we communicate, the way we access data, and it also affects global trade flows.

Internet connectivity distribution across various networks is provided by internet service providers (ISPs) through a hierarchy of tiers: 1) Tier 1 networks: large telecommunication companies that exchange data traffic with each other based on peering arrangements (e.g. Tata Communications or AT&T), 2) Tier 2 networks: purchase internet access from tier 1 networks (e.g. British Telecom or China Telecom), and 3) Tier 3 networks: internet service providers (e.g. Virgin Mobile). Academic institutions, multinational enterprises and government entities often function as ISPs to offer the same functionality as Tier 1 networks, albeit at a local level.

Internet connectivity distribution also includes internet exchange points (IXPs). These exchanges are used by internet service providers (ISPs) and content delivery networks (CDNs) to exchange traffic. The major IXPs are either at country or at regional level depending on traffic. For example, the Montreal Internet Exchange (QIX) in Canada is the country's major internet traffic exchange node, while Neutral Internet Exchange (NL-ix), located in various European cities, is a major set of internet traffic exchange nodes to serve 13 European countries. IXPs effectively connect the various network tiers together into a single global network, called the internet. A key benefit of the internet is that it is fault-tolerant. In other words, in case one of the nodes or connections malfunctions, then data will find an alternative way to reach its destination.

// A RENEWABLE ENERGY INTERNET IS BASED ON A SIMILAR CONCEPT TO THE 'TRADITIONAL' INTERNET //

The global renewable energy internet is based on a similar concept and consists of five layers: distributed renewable electricity resources, networking infrastructure layer, energy router, active network management, and sensors and smart terminals. They can be described as follows:

Layer 1 – Distributed renewable energy resources
Largely decentralised renewable energy sources installed in locations based on optimal weather conditions, complemented with new nuclear (new nuclear is TC), to create a sustainable electricity supply infrastructure.

Layer 2 – Physical networking
The infrastructure of transmission and distribution lines, storage solutions, and transformers to connect the various distributed renewable energy resources and consumers.

Layer 3 – Dynamic energy router
A set of intelligent energy management devices that are used to proportionally direct electricity to where it is being consumed. Energy routers are needed at various levels: global, regional, national, local and even within buildings and homes. Energy routers are critical for peak load shifting across the global energy internet.

Layer 4 – Active network management
The software that controls the energy routers and other parts of the smart grid based on production, storage, and demand data captured using smart sensors.

Layer 5 – Ubiquitous terminals
With about 3.5 billion mobile broadband users, smartphones and other connected devices continuously sense for critical data, which is aggregated into big data and analysed and used by the active network management software to ensure that energy is available where needed.

As initially envisioned, smart grids function at the city or local level and can be further connected into national and regional super grids, or even into a global energy internet. To make these effective, ultra-fast transmission lines between the super grids are needed. Several super grids are being envisioned in Europe and MENA, North America, and Asia Pacific. The key benefit is that at a local, regional and global level, interconnected grids can aggregate various renewable sources of energy,

located in situationally relevant parts of the world, based on different weather conditions, thus smoothing out the variability of renewable energy generation.

But as Jeffrey Sachs put it in an op-ed in the Boston Globe, "Big innovations need big investments."
The same holds true for the Eurasia renewable energy internet (EREI). Currently, no precise estimates are available, but the total investment required could amount to US$100 trillion globally until 2050 or close to US$3tn per year. There are many benefits to this type of investment because it will create advanced jobs and provide clean energy for all at an affordable cost, especially when the health and climate change externalities are internalised.

Similar to the traditional Internet, the digital Belt and Road Initiative (BRI) and an EREI will be affordable, reliable, environmentally sound and resilient, while driving sustainable economic growth.

INCUBATE AND BRANCH OUT TO OTHER SECTORS OF THE ECONOMY

Kazakhstan for instance is incubating its Astana International Financial Centre (AIFC) ecosystem and branching out to other sectors of the economy to achieve sustainable, inclusive and more resilient economic growth. The 4IR's underlying philosophy and technologies can be applied to virtually any sector of the economy. Given Kazakhstan's location and sustainable natural endowment, the AIFC could incubate 4IR technologies and branch out to five or six other sectors where they could be applied and scaled to make a lasting contribution to the economy. These sectors include: 1) oil and gas plus renewable energy, 2) mining and metallurgy, 3) agriculture, 4) transport and logistics, 5) education, and 6) government services (Figure 3).

The AIFC's role will be to provide financing, access to 4IR innovation models and concepts, and human capital development. The other sector ecosystems would then apply 4IR concepts to their own circumstances.

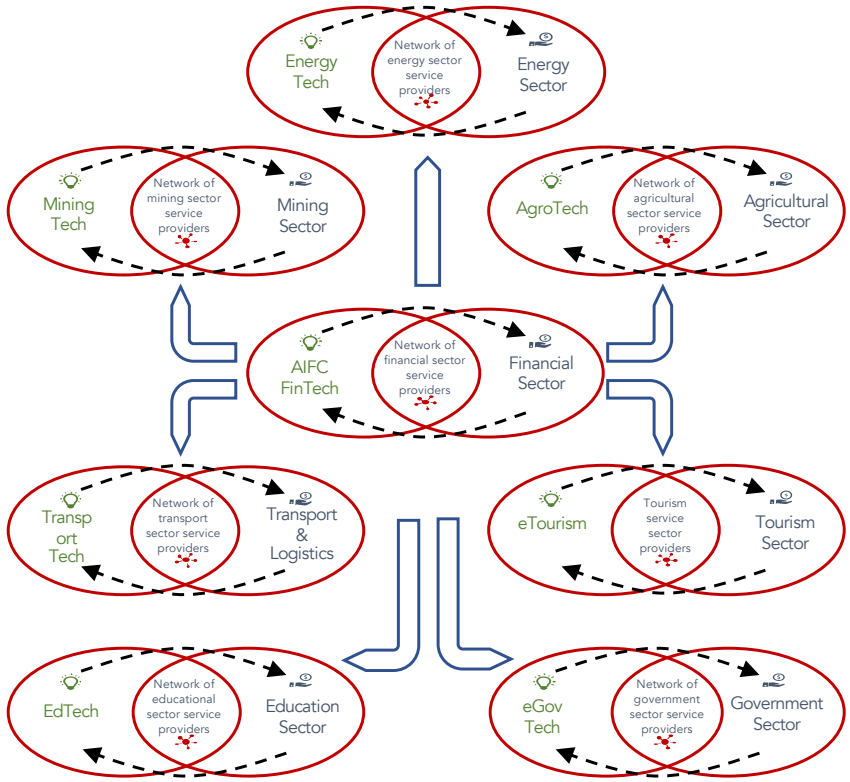
In his 2016 book, *The Fourth Industrial Revolution*, Klaus Schwab argues that: "In the future, technological innovation will also lead to a supply-side miracle, with long-term gains in efficiency and productivity. Transportation and communication costs will drop, logistics and global supply chains will become more effective, and the cost of trade will diminish, all of which will open new markets and drive economic growth."

// IT COULD REQUIRE UP TO US$3tn INVESTMENT PER YEAR UNTIL 2050 //

The AIFC is partnering with the World Economic Forum Centre for the Fourth Industrial revolution in areas such as: 1) blockchain and distributed ledger technologies, 2) artificial intelligence and machine learning, 3) the Internet of Things and connected devices, 4) digital trade, and 5) cyber securities. Through AIFC fintech, we are incubating the application of these technologies to serve the wider Kazakh and regional economies.

In terms of widespread digital connectivity in a 4IR world, two countries have a nationwide IoT network, the Netherlands and South Korea. The IoT, combined with connected devices (e.g. robots), has the potential to provide seamless automation to otherwise mundane manual tasks, such the automation of forex and stock trading.[2] For example, robots connected through an IoT network and enabled by artificial intelligence (AI) could autonomously improve agricultural development from seed dispersal to weed removal and harvesting, thus improving crop yields and virtually eliminating the need for pesticides and thereby resulting in healthier crops.

FIGURE 3. INCUBATE AND BRANCH OUT TO OTHER SECTORS IN THE ECONOMY



Source: AIFC

[2] *A forex or stock trading robot is a computer program based on a set of forex or stock trading signals that helps determine whether to buy or sell a currency pair or stock at a given point in time. Forex or stock trading robots are designed to remove the psychological element of trading and improve the efficiency of digital trading.*