AMATI GLOBAL INVESTORS

Newsletter

Winter 2023: Issue 25

BrightTALKs on demand

Innovation investing in the new economic reality: where do we see opportunities? Please click here to watch.

Insight into performance and portfolio activity over the past 6 months of the Amati AIM VCT. Please click here to watch.

UK AIM IHT - The Road to Recovery. Please click here to watch.

UK Smallcap - What Can Go Right? Please click here to watch.

Opportunities in commodities - from precious to battery metals. Please click here to watch.

Opinion Pieces / Videos / Podcasts

In case you missed some of our recent publications, please note a selection below:

- What's next for metals?
- Green Paradox Explained
- Fundcalibre Podcast - Navigating complexity: ESG and Human Rights with Dr Paul Jourdan
- Vox Markets Fund Manager Series: Q&A with Dr Paul Jourdan
- Amati Insights - Investing in semiconductor industry
- Amati Insights Transcript - The time to be concerned is when the conferences are packed and mood is giddy.

Please click here to visit our media section to view further content.

Amati Insights

Before we break for Christmas and New Year, Paul Jourdan and Mikhail Zverev look back on 2023, share their observations on UK and global equity markets and talk about what they have changed in their positioning and the outlook for investors in 2024.

'2023 in the UK and Global markets - a year to forget?' - Please click here to watch.

Amati Insights will return on Tuesday 16th January.

Factsheets

as at 30/11/2023

WS Amati UK Listed Smaller Companies Fund

WS Amati Global Innovation Fund

WS Amati Strategic Metals Fund

Amati AIM IHT Portfolio Service

Amati AIM VCT

WS AMATI GLOBAL INNOVATION FUND

Photonics and optical communications: the unsung heroes of the digital revolution

Written by
Mikhail Zverev

Photonics and optical communications industry are the unsung heroes of the digital revolution.

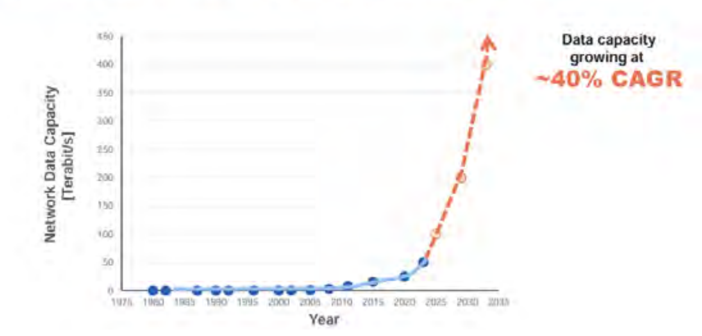
Their innovation is enabling the bandwidth and data transfer speeds that we take for granted today and will be making possible the exciting advances in communications and artificial intelligence (AI) going forward. It is a significant proportion of our Global Innovation Fund portfolio, and in this article we'll look at some of the reasons why we see potential in this area.

We are experiencing an rapid growth of data everywhere. IDC, an respected market forecaster, estimates that "datasphere" (amount of data created, captured and consumed) has been growing at 20% CAGR over the past couple of decades (2010 to 2025E), and is forecast to double again over the next 4 years, so this pace of growth is not slowing.

We are experiencing this in our daily lives and in the more specialist industrial settings: our photos increase in resolution and are becoming videos, jet engines generate gigabytes of data with every flight, industrial equipment collects vibration data to enable predictive maintenance.

Data communication sits at the core of this and benefit from this growth. We have consistently grown into the capacity that the industry built and consistently required more. In fact, the pace of network capacity is forecast to grow even faster than "datasphere" – as we create and collect data, we need to transfer it more often and at faster speed. In fact, network capacity growth required to service, transmit and receive this growing "datasphere" is forecast to be substantially higher, 40% CAGR to 2035, than the "datasphere" growth itself.

UNRELENTING NETWORK DATA CAPACITY GROWTH

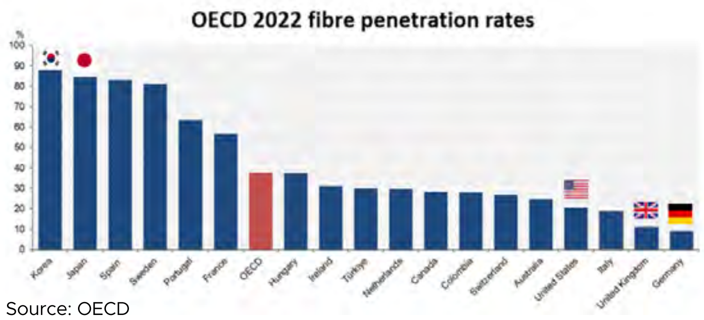


Source: LightCounting, Lumentum

Why does it benefit the optical communications industry specifically? It is to do with a concept of "attenuation" - signal loss over distance. In copper, which up until recently was the main conduit of data and signal, attenuation grows with higher frequency, and frequency is correlated with bits per second data transfer speed. So as broadband speeds increase, copper is increasingly failing to cope. As a result, it is technologically inevitable that we need to shift data transfer more and more from copper to fiber optics, which does not suffer from the same issue.

We have seen it in the consumer broadband offering. Whereas once fiber only reached telephone exchanges, it has rolled out to cabinets on street corners, and now to the consumers' homes. This "fiberisation" has further to run. As the chart shows we're not yet done with household fiber broadband penetration. Whereas highly fiberized countries like South Korea and Japan are near 90% penetrated, major economies like US, UK and Germany are lagging a long way behind.

This fiberisation is repeated across enterprise networks as well, driving demand for optical communications components and equipment.



Source: OECD

Another aspect favouring photonics is energy consumption. Optical communications consume a lot less power than copper to transmit data (70% less by some estimates). Data centres already account for 4% of global electricity consumption, and in some areas you can't build a new data centre as there is simply no electric power available. In other cases, for example in high performance AI datacentres, energy consumption is so high that the servers need to be water-cooled. So energy efficiency plays to photonics advantage, too.

Two recognised technological developments on everyone's mind, 5G and AI, also help photonics market grow.

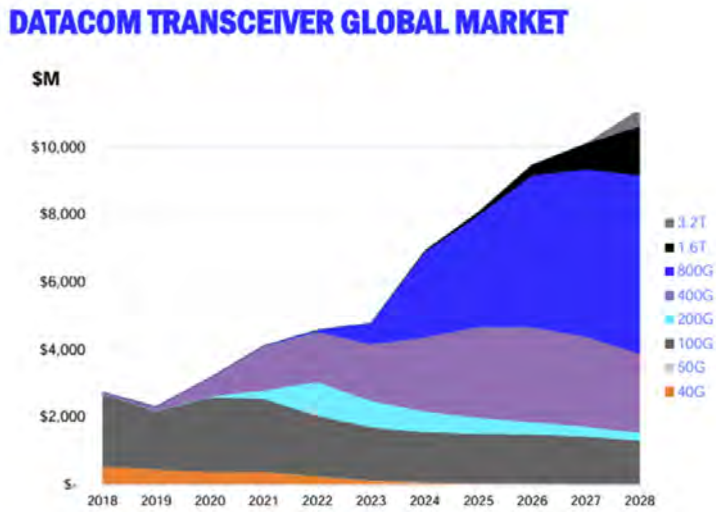
Telecom companies had rolled out their initial 5G networks, and will continue to "densify" these, making the base stations (both large cell towers and small cells in busier urban environments) more dense than the 3G or 4G networks were in their time. As those cells fill up with wireless data traffic, landing that data back into network core will require optical links - so called backhaul and fronthaul. Effectively, 5G network architecture will require more fiber everywhere.

AI is also proving to be an accelerant for optical communications. AI "clusters", super-computer installations that run the likes of ChatGPT and other LLM AI models, require a lot of data to be transmitted around the data centre. According to Arista, the networking spend per dollar of capex in such environments could be over 2x the "traditional" data centre and a lot more optics will need to be used.

The photo is the latest Google AI supercomputer, powered by its proprietary TPU chips. While chips got most of the attention, what is equally interesting is the optical connections between the elements of this structure. Google and other hyperscalers need to connect individual servers with optical communications to ensure that "interconnect" does not slow down the overall system performance and that power consumption is sustainable.

Source: Google

As a result, the industry expects structural growth in demand for optical components for both telecom networks and data centres of 12-13% CAGR between 2023 - 2028, (according to LightCounting and Dell'Oro, leading industry forecasters). These two market segments are already multi-billion in market size each and are growing fast.



Source: LightCounting, Coherent

AI related optical markets are growing even faster and forecast to grow between 30% and 40% CAGR between 2023 and 2028 (according to Lumentum and Coherent, leading vendors in that segment).

Optical communications and AI capture the headlines, but the same or similar photonics components enable other game-changing functionality in areas as varied as industrial cutting and welding applications, industrial and auto sensors, 3D printing, semiconductor manufacturing and aerospace and defence. For example, anti-missile measures increasingly see flares being replaced by directed laser beams, and the uranium enrichment industry is talking about using lasers to enrich uranium. In sensors, the same technology that transmits signal in long distance optical cables is used to authenticate user's facial features in Apple's FaceID application.

The photonics industry is a set of oligopolies, concentrated small groups of companies that excel in a particular segment. Technology transitions between generations of products had winnowed out the field to a few successful, profitable leaders. The speed race in photonics (from 50 Gigabit per second to 100, 200, 400 and now 800) is similar to semiconductor industry "Moore's Law".

Western component players Coherent and Lumentum lead across several applications and are particularly strong in telecom and datacom photonics. IPG Photonics and NLight lead in industrial applications. MKS Instruments leads in specialist semiconductor and electronics photonics tools. Chinese players has been disruptive at the low end of industrial use cases, and some like Innnolight achieved strong market shares in data com, but may struggle to grow from here given geopolitical issues. US listed Fabrinet is a leading contract manufacturer in the photonics space.

As a result of this concentrated competitive set, deep technology moats and attractive long term growth most of these companies are profitable and cash generative through the cycle – an essential feature we're looking for in our investments.

Some of these markets are also cyclical, so this compelling structural growth is never a straight line upwards. In some of these markets we're experiencing these cyclical headwinds right now. Telecom capex has temporarily slowed, as the industry digests its first wave of spending on 5G networks. 3D sensing in smartphones and photonics for industrial applications are both subject to product cycles and general macroeconomic uncertainty. As a result, there are opportunities to buy into these multi-year growth runways at an attractive, temporarily depressed valuation. We are confident that these issues will prove transitory and therefore photonics is a material part of our Global Innovation Fund portfolio.

Sources: IDC, Del'Oro, LightCounting, companies data

Past performance is not a reliable indicator of future performance. The value of investments and the income from them may go down as well as up and is not guaranteed; investors may not get back the amount originally invested.

Latin Resources

Written by
Mark Smith

We attended a site visit to Latin Resources ('the company') in late September 2023.

This 'lithium valley' is located in the state of Minas Gerais in south eastern Brazil, which hosts one of the world's largest belts of granitic pegmatites hosting high quality lithium bearing spodumene and petalite. The belt covers 150,000km2, stretching from the state of Bahia through Minas Gerais to Rio de Janeiro.

After a desktop screening process, Latin Resources had investment potential. The company had already announced a resource of 45.2 million tonnes at 1.34% Lithium Oxide (Li2O) at the Colina project. However we considered the geology and structural setting of this orebody to be conducive for expansion and economic development.

While on site the company announced a preliminary economic assessment for a 3.6 million tonne per year standalone mining and processing operation.

The 2 phase development had an after-tax net present value (8%) of A$3.6 billion, from an initial mine life of 11 years, producing 405,000 t/yr concentrate (5.5% Li2O) from a dense media separation plant. Development capital estimated at US$330m.

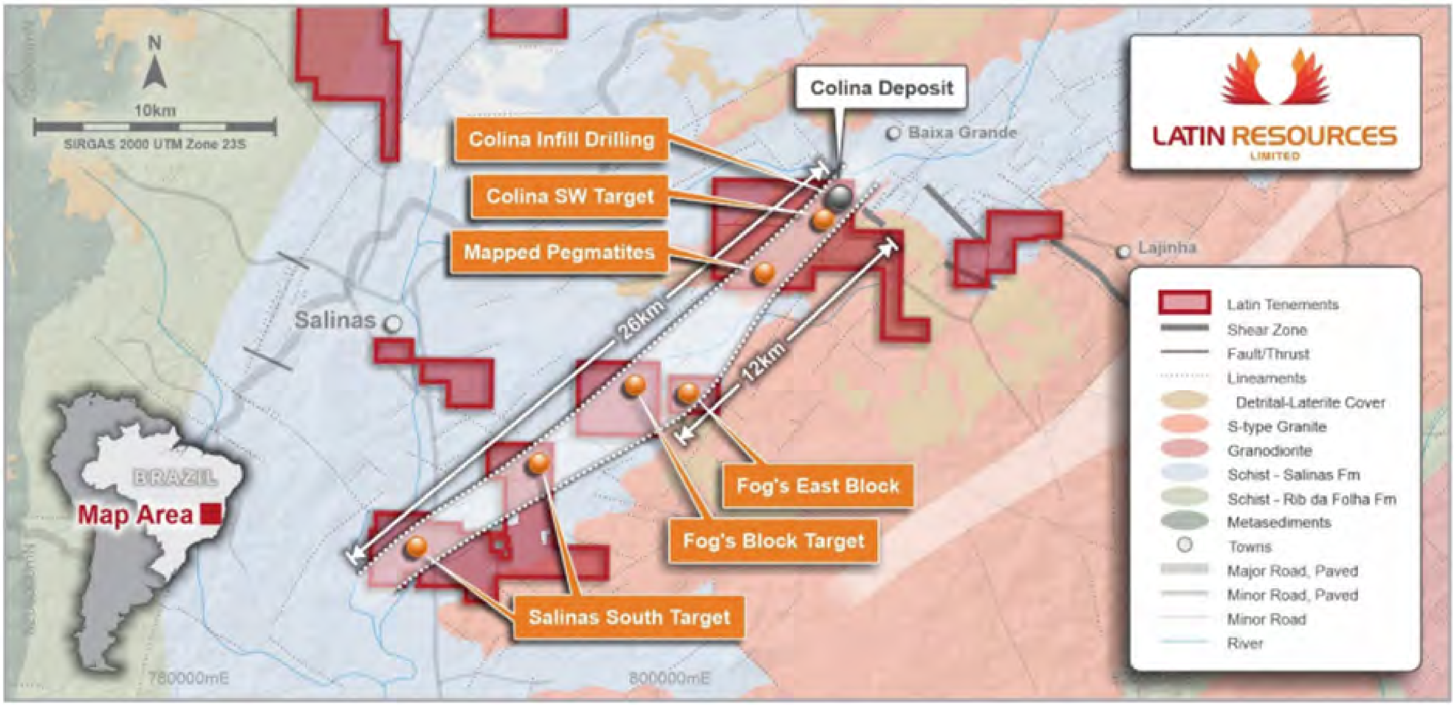
However, we considered the company's 25km lithium corridor very prospective for additional spodumene rich pegmatites. We noted 3 areas of potential:

1. Colina SW extensions – Drilling directly along strike from Colina has identified the presence of a new pegmatite system developing.

2. SW Pegmatite Outcrop – Initial drill testing beneath mapped weathered pegmatites at surface has returned fresh spodumene rich intersections.

3. Fog's Block – Drilling on several completed drill sections has confirmed continuous high - grade spodumene pegmatites.

Figure 1 - Latin Resources project area



Source: Latin Resources

The WS Amati Strategic Metals Fund invests in companies that have operations in developing markets and which therefore may be subject to higher volatility due to political, economic and currency instability.

Figure 2 - Boots on the ground process - investment process

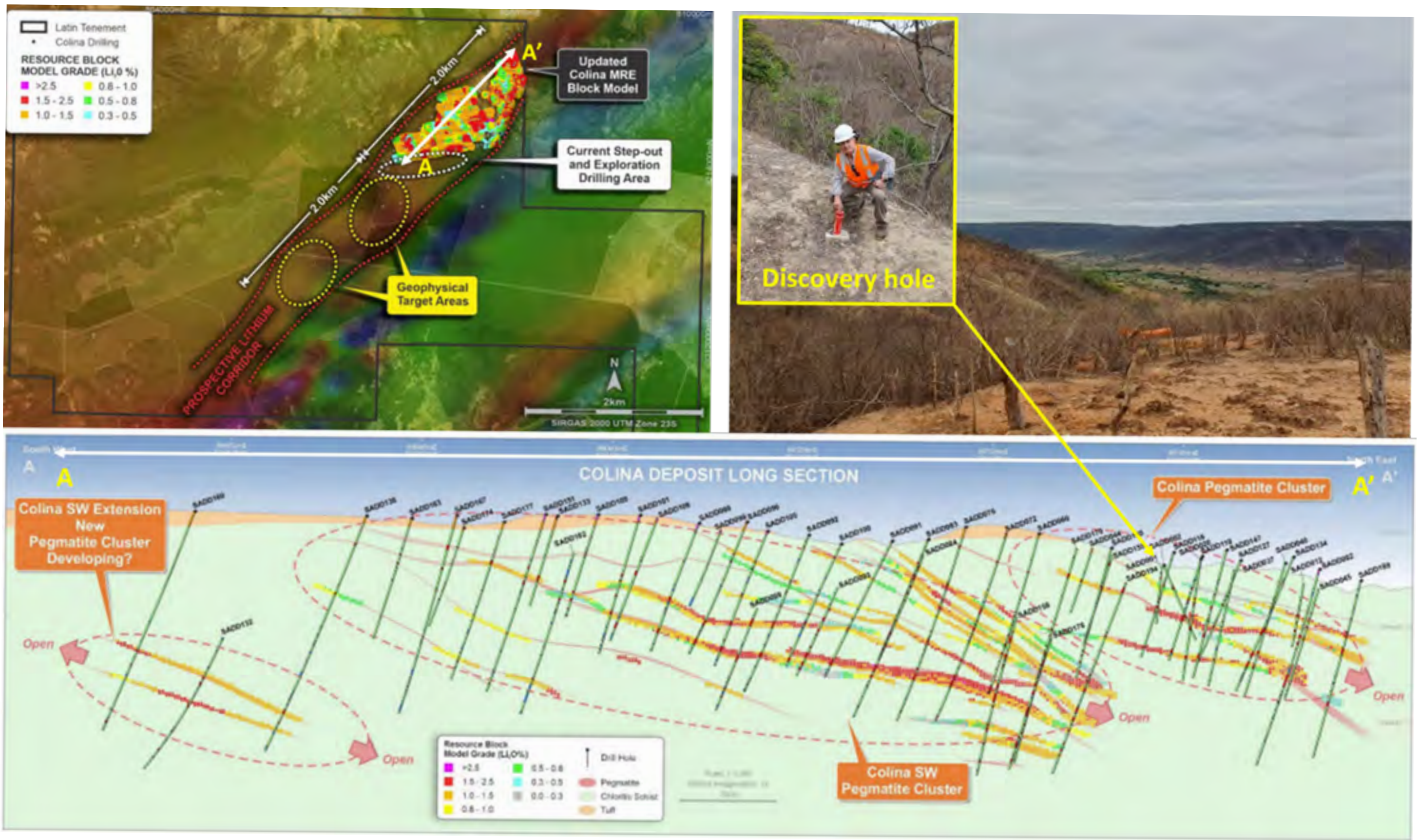
Source: Amati field trip; Sept 2023

On return from the site visit we participated in a A$35m capital raise at A$0.25 per share, to fund the project development and further resource drilling. On the 6th December 2023, the company announced a 56% increase in the project resource to 70.3 million tonnes at 1.27% Li2O, comprising of 63.5 Mt at Colina and a maiden resource of 6.8Mt at Fog's Block.

The substantial increase of the resource will have a significant positive effect on the economics within the Definitive Feasibility Study due for completion in mid-2024. We expect this investment to track the value curve of Sigma Lithium which has similar development characteristics. Also the same mining consultants that worked on Sigma project are now working on Latin Resources Salinas lithium project to take Latin to next stage of development.

'#you can't kick tyres and lick rocks from a Bloomberg screen'

Figure 3 - Further resource growth potential



Source: Latin Resources; Amati

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Past performance is not a reliable indicator of future performance.

WS AMATI UK LISTED SMALLER COMPANIES FUND

Tickets Please

Written by
Scott McKenzie

Having endured some near-death experiences during the COVID lockdowns the rail industry globally has got back on it's feet and is now entering a period of significant transformation. This is driven both by the recent lessons learned and by the escalation of some key longer term trends.

These structural drivers include:
· Digitalisation of the customer experience
· Significant investments planned in high speed networks
· Technology-led efficiencies in operating systems
· The decarbonisation of mass transportation on the road to Net Zero.

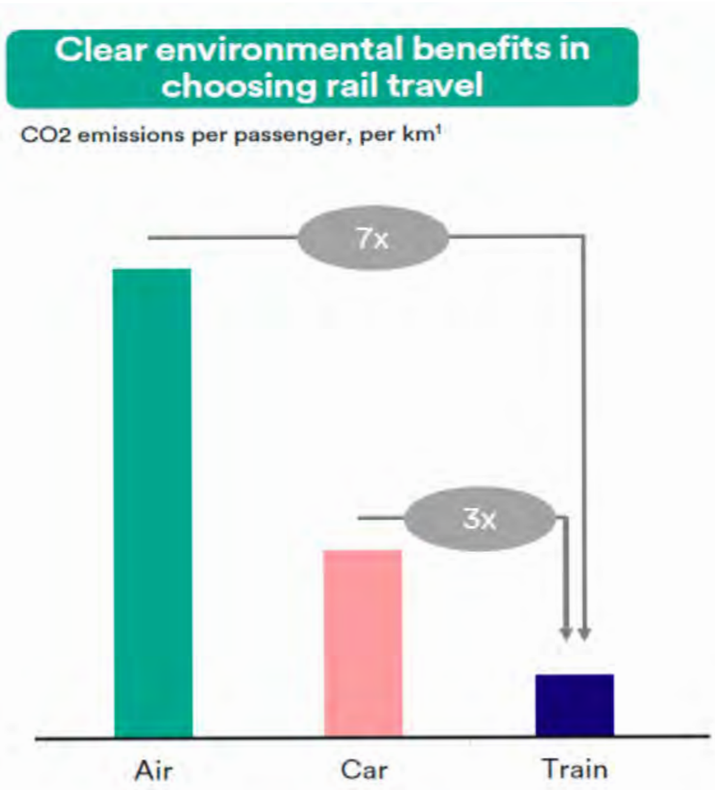
The road to recovery post Covid for the railways has been a painful one, with the trend towards working from home in particular having become embedded in the working lives of many and office attendance still well below pre-pandemic levels. In the UK we have endured the additional trauma of frequent strike action as the various transport unions have sought improved packages for their members in response to the rising cost of living. However, during this period of upheaval some positive developments have emerged.

The process of digitalisation of the customer journey has changed beyond recognition with the use of e-tickets having doubled in the UK over the past three years, from 21% to 43% of all tickets sold. All of the indicators are that this penetration will increase further as the rail network looks to become more efficient and have less physical ticketing outlets going forward. Digital transport ticketing has become a part of our daily lives and is here to stay.

Source: Trainline

This ongoing drive for efficiency is not just at the customer level. Despite government budgets becoming increasingly restrictive the need to invest in capacity and network efficiency has become all the more urgent across the UK and Europe as governments are under pressure to meet their Net Zero commitments and accelerate the drive towards a greener transport system. The rail industry is ideally positioned to meet this challenge of transition if the appropriate investments can be made.

The UK Government estimates that travel by air has 7x the CO2 emissions per passenger that rail has. The prize is therefore a large one if we can achieve this modal shift, especially in shorter-haul routes.



[1]Emissions per passenger/KM as per https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021

None of this will come cheap and huge investment is required not only to maintain and upgrade existing networks but also to expand the high speed routes needed to displace air travel. In the UK alone Network Rail has now agreed a £44bn spending plan for 2024-29 under it's CP7 framework which covers all aspects of future growth and maintenance.

The same plan also outlines an additional £18-26bn estimated cost of decarbonisation in the rail network out to 2040.

Europe finds itself at the early stages of a deregulation phase with countries such as Italy and Spain already opening up to competition on key domestic connections and displacing airlines on routes such as Barcelona to Madrid. Progress in France and Germany is somewhat slower so far but change is inevitable. The European rail market is estimated to be worth e60bn already with the EU having a target to double the length of the high-speed network by 2030 and triple it by 2050.

Investing in rail will always be accompanied by large amounts of political risk, with the majority of the industry across Europe still in public ownership and the core of the railway workforces remaining highly unionised. However the need for modernisation, efficiency and decarbonisation is there for all to see.

At Amati we have identified a number of small and midcap companies which we believe are well placed to benefit from these major transformations taking place. These range from earlier stage businesses held in our VCT to those which have already made the transition into our main UK Listed Smaller Companies Fund. We currently have three important holdings in this sector and we summarise their investment cases below.

Cordel

Cordel provides engineering surveying services using specialised LiDAR sensors. These digital devices record large datasets from transport corridors, such as rail networks, for analysis on an AI software platform. This "intelligent infrastructure" solution allows the network owner to automate inspections, predict failures and dramatically improve asset management. Specifically for railways, it surveys track infringements (vegetation growth), clearances (overhead and adjacent infrastructure), crossing points, defects, drainage and ballast (sleepers plus hardcore) - all from the standpoint of derailment risk. The LIDAR sensors are positioned either on the front or rear of the train, and capture a 360 degree mix of high resolution images and data. This data-gathering is both an accident prevention and a regulatory requirement. It replaces current low-tech manual and video practices, involving diesel-polluting, slow-moving inspection trains, and paper records.

Commercial progress has been relatively recent, but significant. In 2021, Cordel partnered with a leading US rail services company, Holland, whereby their inspection vehicles carry Cordel sensors and then it was awarded a six year £3.2m contract with Network Rail to provide a SaaS platform for the storage and processing of gauge and clearance data for the entire UK rail network.In 2022 it was awarded a five year contract with Angel Trains, the UK's leading ROSCO, to install its solution onto in-service passenger trains. In 2023 it has been awarded a six year $6.7m contract with Amtrak, the main provider of intercity passenger rail services in the US, to deliver an automated clearance management solution. This was won against larger competitors, including Balfour Beatty and Deutsche Bahn, despite Cordel being more expensive.

The Amati AIM VCT invested in early 2023, when the company raised qualifying funding for working capital in the UK and US. This is still an early stage company, emerging from trading losses, but the contract success suggests a high degree of commercial verification - train operators don't generally allow third party access to their mission critical network assets.

TRACSIS

Tracsis plc is a provider of software, hardware, data analytics/ geographical information system (GIS) and services for the rail, traffic data and transport industries. The Company operates through two segments: Rail Technology & Services (65% of ebitda, 46% of revenues) and Data Analytics, Consultancy & Events (35% of ebitda , 54% of revenues). The Rail Technology & Services segment provides a range of products and services for the rail industry, and it's customer base includes train operating companies and infrastructure providers, with Network Rail being c.10% of group sales. The DACE division includes traffic data collection ,event planning ,traffic management, data analytics and consultancy offerings.

Since 2019 the current management have worked hard to simplify the business and introduce a 'One Tracis' culture, doing away with silos and encouraging much stronger cross-selling . More recently they have been moving towards a repeat revenue/SSAS model, which is now 60% of the Rail Tech division's sales. In addition they have entered the vast North American market and this now accounts for more than 10% of group sales, with scope for this to rise significantly. Other exciting initiatives include a unique pay-as-you-go ticketing technology about to be launched.

We have known the business well since its IPO on AIM in 2007. More recently Tracsis has been added to our UK Listed Smaller Companies Fund and is also held by clients in our AIM IHT service.

trainline

Trainline is the dominant online rail ticketing platform in the UK with around a 33% market share of total net ticket sales in the UK rail network and more than 70% share of e-tickets. The e-ticket market is now almost half of total rail network sales and Trainline has grown rapidly , investing heavily during the COVID lockdowns such that it's revenues are now 25% ahead of pre COVID levels despite the rail network still being well below the traffic levels seen prior to the pandemic.

As well as dominating the UK market Trainline is growing rapidly across Europe as deregulation is fuelling major network growth, allowing Trainline to penetrate markets previously dominated by state-owned carriers. It now has fast growing operations in Spain and Italy and has a presence in France too, although the latter has been far slower to open up. Spain grew 4x last year and Italy 3x so these are becoming material. At the moment International operates at a loss and is only 35% of the size of the UK but strong profits in the UK can help fund the expansion plans in Europe going forward. The total European rail ticket market is worth e60bn and Trainline currently have just under e1bn of ticket sales.

At it's core Trainline is a technology business, with its Solutions division dealing with B2B licensing of its technology, including the white labelling of apps for over 270 carriers. This is in addition to its dominant Trainline brand which is much-loved by passengers. They have around 500 employees in data and software which provides a key competitive advantage and moat for the business. Whilst political risk will always be a feature here we believe that it's market position will be almost impossible for others to replicate.

As the UK business matures and the exciting growth plans in Europe come to the fore Trainline should be a highly cash generative, high return investment and it is already a core holding in our UK Listed Smaller Companies Fund

Investment in smaller companies can be higher risk than Investment in well-established blue chip companies. Funds investing significantly in smaller companies can be subject to more volatility due to the limited marketability of the underlying asset.

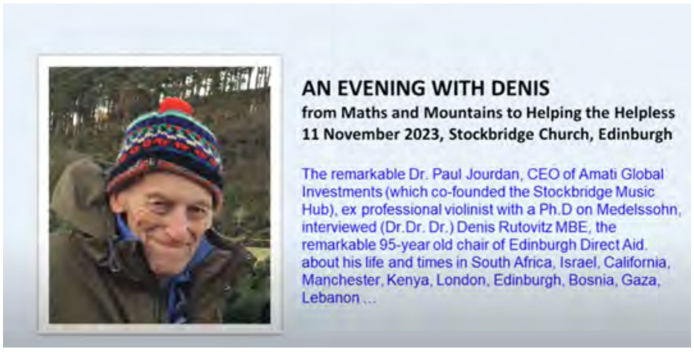
Charitable Engagement

Amati Global Investors gives 10% of its net profits to UK registered charities. These are chosen by Amati's shareholders in proportion to the percentage that they own. Since inception Amati shareholders have donated £1,281,238 to a number of worthy causes.

Edinburgh Direct Aid

Paul Jourdan interviewed the 95 year old founder of Edinburgh Direct Aid (EDA), Denis Rutovitz recently (a charity that Amati supports). You can listen in to the recording of his incredible life in South Africa, Israel, California, Manchester, Kenya, London, Edinburgh, Bosnia, Gaza, Lebanon and how he came to found this Scottish charity whose mission is to Help the Helpless.

Please **click here** to listen.



Future Asset

We are a member firm of Future Asset which is a charitable organisation set up to inspire young women to consider career opportunities in investment management. As well as being a charitable donation, being a Future Asset Member firm is a public demonstration of our commitment to increasing diversity in investment management, and a practical way to develop and engage future talent and promote name recognition with students, teachers, careers advisers and parents.

Merry Christmas!

We would like to thank all of our investors for their continued support and wish everyone a Merry Christmas and Prosperous New Year from all the team at Amati!

We welcome regular feedback, thoughts or comments so please do get in touch via email at info@amatiglobal.com or call us on 0131 503 9115.

Our virtual Christmas card can be accessed here.

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Risk Warning

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These investment products place your capital at risk and you may not get back the full amount invested, even allowing for any tax breaks. The value of your investment may go down as well as up. Past performance is not a reliable indicator of future performance. Investors should be aware that any investment in equities is subject to risk, and that investment in smaller companies, in particular unquoted companies and those quoted on the Alternative Investment Market (AIM), carries an even higher risk than that of larger companies listed on the main market of the London Stock Exchange. This is due to the higher volatility and lack of liquidity often found in smaller company shares, as well as typically higher levels of business specific risks. Illiquidity means that buying and selling portfolio holdings may take some time, and in a worst case scenario portfolio companies could be delisted from AIM, making them very difficult to buy or sell, which in turn could affect the value of your investment. Current tax rules and the available tax reliefs offered on investments into AIM-quoted stocks may change at any time, and there is a considerable risk that if the legislation changed in respect of these tax reliefs, then those portfolio companies that no longer qualified for such reliefs would be subject to heavy selling pressure, potentially leading to significant investment losses.