



IXICO: Profit from artificial intelligence in neuroscience

The world's largest biopharmaceutical companies are investing huge sums of money in the field of neurology. This has created a surge in demand for the services of companies that use proprietary artificial intelligence (AI) software algorithms to analyse brain scans'

IXICO (IXI)

Ticker	IXI
Current price (p)	33p
Target price (p)	55p
Market cap (£m)	£15.4m
52-week high (p)	43p
52-week low (p)	18.78p
Net cash (£m)	£7.5m (reported at 31 March 2019)
Shares in issue (m)	46.78m
Financial year-end	30 September
Next event	Pre-close trading update mid-October 2019
Company website	ixico.com

Simon Thompson's view:

IXICO may be a small-cap London-based company well under the radar of investors, but it is highly regarded by pharmaceutical and biotechnology companies and huge corporations are increasingly awarding the company new contracts. In fact, IXICO has booked over £20m worth of new orders since the start of last year, a revenue stream that underpins a move to operating profitability. Once that inflexion point is passed, the high gross margin earned from its cutting-edge data analytics activities means operating profits are set to move sharply higher in the years ahead, a point that is not factored into a valuation of little over one times the company's enterprise value to forecast sales in the 2021 financial year.

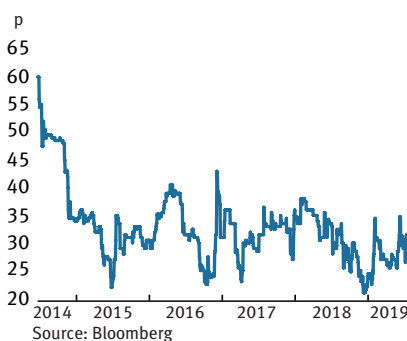
Bull points

- High and rising gross margins from proprietary software.
- Blue-chip client base.
- Contracted revenue stream covers all of 2019 and two-thirds of 2020 forecasts.
- Strong and fast-growing order book.
- Over 90 per cent of revenues derived from overseas, so hedge against further sterling weakness and a hard Brexit.
- High client retention rates.
- Operationally geared, so clear pathway to profitability.
- Experienced management team enhanced by new recruits.
- Multi-million dollar contract wins.
- Annual revenue growth target of 20 per cent.
- Executing on five-point strategic plan to accelerate pace of contract wins.
- Cash-rich balance sheet backs up 50 per cent of market capitalisation.
- Five consecutive six-month periods of double-digit revenue growth.
- Stock overhang cleared and highly regarded long-term institutional investors on board.
- Director share buying.

Bear points

- Contracts could end mid-trial due to trial failure.
- Liquidity.
- Execution risk in accelerating growth.
- Regulation and compliance.

IXICO share price



Analyst: Simon Thompson
simon.thompson@ft.com

Alpha Production Editor: Sameera Hai Baig

“IXICO uses its proprietary artificial intelligence software algorithms to analyse images from brain scans in order to provide highly accurate measurements of small changes in brain structure”

Momentum is clearly building at **IXICO (IXI)**, an Aim-traded data analytics company that provides complex medical imaging analysis services to the world’s largest biopharmaceutical companies who are active in the field of neurology and targeting therapies for diseases affecting the central nervous system: Huntington’s, Alzheimer’s, cerebrovascular disease, multiple sclerosis, Parkinson’s and progressive supranuclear palsy.

In a nutshell, IXICO uses its proprietary artificial intelligence (AI) software algorithms to analyse images from brain scans– magnetic resonance imaging (MRI) and positron emission tomography (PET) – in order to provide highly accurate measurements of small changes in brain structure. To do this the company’s proprietary LEAP algorithm harnesses the power of large datasets and computer-based learning to segment specific regions of the brain and then accurately measure their volume, thus providing a reliable method of measuring brain atrophy, which can indicate progression of neurological disease. To date, the algorithm has been applied to more than 150 brain regions, analysed more than 100,000 brain scans and has been cited in more than 750 scientific publications.

The company has also developed AI technology to assess brain pathology such as white matter lesions and, more recently, uses data from wearable biosensors to accurately measure sleep patterns in Parkinson’s disease and dementia patients. These approaches enhance the understanding of disease symptoms more directly compared with manual assessment or complex in-clinic technology.

Importantly, by applying IXICO’s data science expertise, these measurements have the potential to increase success rates of clients’ clinical trials by improving patient selection, lowering the cost of running them, and lessening the

IXICO (Aim: IXI)

Ord Price: 33p Market Value: £15.4m

Touch: 31-33p 12-Month High: 43p Low: 18.78p

Dividend Yield: nil PE Ratio: 41

Net Asset Value: 16p Net Cash: £7.5m

Year to 30 Sep	Revenue (£m)	Pre-tax profit (£m)	Diluted earnings per share (p)	Dividend per share (p)
2014*	3.41	-2.49	-15.2	nil
2015	3.11	-1.39	-7.9	nil
2016	3.26	-2.87	-8.7	nil
2017	4.10	-1.91	-5.7	nil
2018	5.39	-0.79	-2.0	nil
2019**	6.60	-0.56	-1.0	nil
2020**	8.00	-0.20	-0.2	nil
2021**	9.60	0.44	0.8	nil
% change	21%	-	-	-

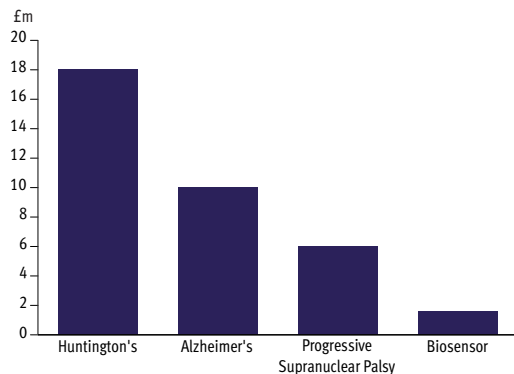
*16-month period to end 30 September 2014

** Cenkos Securities estimates

Normal market size: 1,500 SETSqx

Source: IXICO annual report, London Stock Exchange

Announced contract values by therapeutic area (May 2014 to May 2019)



Source: London Stock Exchange RNS, IXICO annual reports (2014-18) and company

burden on trial participants and their carers by reducing the need for clinic visits. In addition, the data outputs are used by the biopharmaceutical sponsors to assess the efficacy of new drugs being trialled, and monitor patient safety during the trial itself.

Tapping into huge market potential

By partnering with longer established biopharmaceutical clients for late-stage development and commercialisation of their therapies, and smaller biotechnology companies that are leading early-stage drug development, IXICO is tapping into the huge research and development spend that is being directed into this area of neuroscience.

For instance, the top 20 biopharmaceutical multinationals are estimated to have spent \$74.2bn (£59bn) on research and development in 2016 according to US industry body PhMRA. That's a huge sum of money, but one that's small change compared with the estimated \$800bn (£600bn)

Announced contract values by therapeutic area (May 2014 to May 2019)

Disease	Contract value
Huntington's	£18.0m
Alzheimer's	£10.0m
Progressive Supranuclear Palsy	£6.0m
Biosensor	£1.6m

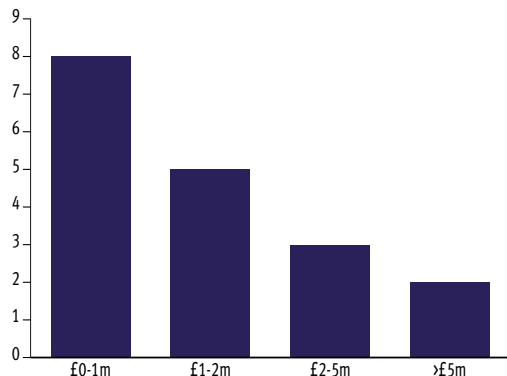
Source: London Stock Exchange RNS; IXICO annual reports (2014 to 2018); company data

Analysis of IXICO's contracts (May 2014 to May 2019)

Announcement	Type	Client	Value	Duration (years)	Condition	Study phase
22/05/2014		Top 15 pharma		2	Huntington's	
26/11/2014	Extension	Top 15 pharma	£2.5m	3	Huntington's	
24/04/2015					Huntington's	
28/08/2015	Existing	Top 10 global pharma	\$6.8m	7	Alzheimer's	Phase 2/3
18/01/2016		4 contracts	£3m	4	Alzheimer's	Phase 1 to 3
04/04/2016	New	Oxford Biomedica		5	Parkinson's	Phase 1/2
20/10/2016	New	Top 15 global pharma	\$1.2m	3	Progressive Supranuclear Palsy	Phase 2a
13/03/2017	Existing	Top 10 pharma	\$1.5m	3	Progressive Supranuclear Palsy	Phase 2b
05/07/2017	New	Biopharmaceutical	€0.8m	3	Alzheimer's	Phase 2
05/09/2017	Extension	Top 10 global pharma	\$0.9m	8	Alzheimer's	Phase 2/3
25/09/2017	New	US biopharma	£1.2m	3	Huntington's	Phase 2
28/09/2017			\$0.69m	2.5	Huntington's	Phase 2
30/01/2018	Existing	Global pharma	\$2.7m	7	Progressive Supranuclear Palsy	
04/04/2018	Extension	Top 15 global pharma	\$0.75m	3	Progressive Supranuclear Palsy	Phase 2a
10/05/2018	Extension	Biopharmaceutical	£0.5m	2	Alzheimer's/Huntington's	Phase 2
14/05/2018	Existing	Top 10 pharma	£1m	3	Huntington's	
12/06/2018	Cessation	Top 10 global pharma			Alzheimer's	Phase 2/3
13/08/2018	Extension	Top 10 pharma	£0.6m	3	Huntington's	
30/08/2018	Extension	Biopharmaceutical	€0.5m	4	Alzheimer's	Phase 2
11/09/2018	Existing	Top 10 global pharma	£9.1m	4	Huntington's	Phase 3
04/12/2018	Extension	Top 10 biopharma	\$2.4m	7	Progressive Supranuclear Palsy	
24/04/2019	New	Biopharmaceutical	£2m	7	Huntington's	

Source: London Stock Exchange RNS; IXICO annual reports (2014 to 2018); company data

IXICO announced contracts by value (May 2014-May 2019)



Source: London Stock Exchange RNS, IXICO annual reports (2014-18) and company data

spent globally in 2017 on healthcare costs for the most common neurological diseases (‘The burden of neurological diseases in the United States’, Borenstein et al, *Annals of neurology*, April 2017).

In light of the huge amount of money being invested in drug development programmes in neurology, outsourcing clinical trials to contract research organisations (CRO) is an established trend in the industry and a very large market, too, estimated to be worth \$57bn globally in 2020, according to Frost & Sullivan Global CRO Report, 2015. Within this spend, the market for imaging services is worth over \$1bn a year, and the neuroscience trial ecosystem is worth over £100m, according to the directors of IXICO.

Importantly, IXICO has been winning a raft of new contracts in the past few years to tap into the demand.

The company was awarded £15m-worth of new contracts in the financial year to 30 September 2018, and a further £5.2m in the first half to end March 2019, to take the closing contracted order book to £21.2m. This strong contract momentum explains why IXICO’s revenues surged by over 30 per cent to £5.4m in the 2018 financial year. It also means that all of the £6.6m revenue that analysts forecast the company will generate in the 2019 financial year, and two-thirds of the £8m revenue forecast the year after, is already covered by contracts in place.

IXICO revenues by geographic region in 2018

Country	Percentage
USA	72.8%
UK	8.9%
EU	17.6%
China	0.7%

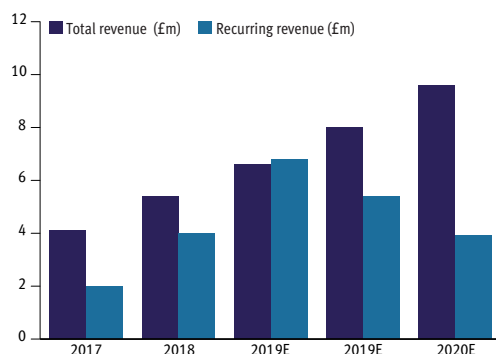
Source: IXICO annual report (2018)

IXICO contract revenue visibility

Year	Revenue	Contract visibility
2017	£4.1m	£2.0m
2018	£5.4m	£4.0m
2019E	£6.6m	£6.8m
2019E	£8.0m	£5.4m
2020E	£9.6m	£3.9m

Source: company data; Cenkos Securities (April 2019)

IXICO contract revenue visibility



Source: Company data, Cenkos Securities (April 2019)

It’s no coincidence that the marked change in IXICO’s fortunes coincided with the appointment of 57-year old Giulio Cerroni as chief executive in February 2017. Mr Cerroni has over 30 years of international management experience gained in the life sciences and diagnostics sectors. He was previously managing director of the genomics division of LGC Group, the international life sciences measurement and testing company where he increased divisional revenues threefold and doubled profits through

“IXICO won its largest contract ever last autumn, a £9.1m four-year award with a top 10 global pharmaceutical company”

a combined organic and acquisitive growth strategy that spanned 10 locations globally. Previously, he held a variety of senior roles at Thermo Fisher Scientific, Abgene, Anachem and ICN Biomedicals.

Mr Cerroni’s ambition is for IXICO to become the global partner of choice to the pharmaceutical industry as companies integrate digital healthcare technologies as part of their overall product offering. Mr Cerroni is succeeding as eight of the 14 top 20 biopharmaceutical companies that have active neurological drug development programmes are now clients of IXICO.

It’s not just the highly scalable core imaging business that has been reporting record revenues, IXICO’s turnover last year was further enhanced by a strong first year revenue performance from the company’s wearable biosensors. Use of biosensors to collect so-called “real world evidence” has a wide range of potential applications across the spectrum of clinical development, and into post-marketing surveillance, too. IXICO’s core capabilities in managing and analysing large amounts of anonymised patient data, as well as its deep understanding of neuroscience, means that it is well placed to apply its capabilities and technology in this emerging disruptive field.

Focus on Huntington’s disease

The other reason why IXICO has been winning so many contracts is that it is targeting the areas of central nervous system research where there are significant clinical trial programmes already ongoing.

A key focus has been on Huntington’s disease, a rare genetic neurodegenerative disorder that affects movement, cognition and behaviour. In the 2018 financial year, around a quarter of IXICO’s revenues were generated from Huntington’s disease contracts. This is set to rise following a number of notable contract wins.

Indeed, IXICO won its largest contract ever last autumn, a £9.1m four-year award with a top 10 global pharmaceutical company to provide its technology enabled imaging services to support a pivotal phase III study into the disease. As part of this study, IXICO is utilising its expertise to optimise, standardise and collect MRI data from specialist imaging centres across North America, Latin America, Europe, Asia and Australasia. IXICO’s data science expertise and AI software algorithms are then applied to provide insights into brain cellular microstructure and neuronal connectivity to support the evaluation of drug safety and efficacy.

The contract expanded IXICO’s relationship with an existing client and was the fourth new contract in Huntington’s disease announced in the 2018 financial

“IXICO continues to win contracts, having announced awards with two biopharmaceutical companies earlier this year”

year, demonstrating the increasing adoption of IXICO’s scientific and operational expertise in this important area of clinical development. It also reflects the fact that the drug pipeline for potential treatments of Huntington’s disease has grown significantly in recent years, reflecting the technical advancements in the field of gene and cell therapies. This recent progress means that there is now a real prospect of bringing an effective therapy to market, potentially transforming the lives of thousands of people living with Huntington’s disease and their families, as well as those who are asymptomatic carriers of the faulty gene. More than 30,000 Americans suffer from Huntington’s disease with a further 200,000 at risk of having inherited the disease.

New therapies being developed will probably be most effective at preventing Huntington’s disease-related decline when they are given as soon as changes can be detected, and potentially before the physical onset of symptoms in young adult gene carriers. Bearing this in mind, IXICO’S technology can accurately measure changes in the volume of brain segments that are specific to Huntington’s disease. These changes, together with genetic and cognitive assessments, are being evaluated in clinical studies to determine when the first signs of the disease can be reliably detected.

The company has also developed and validated data analytics that can analyse brain MRI scans to a high degree of accuracy. In the case of Huntington’s disease, its algorithms are able to detect small changes in brain structure and the brain connectome (brain pathways and circuits) which correlate with underlying genetic disease burden and clinical decline. As a result, their measurement in clinical trials could indicate a beneficial drug effect, potentially supporting a future submission for regulatory approval.

There are currently 23 early and late-stage known trials into Huntington’s disease, of which 15 are active studies in phase II or III, according to ClinicalTrials.gov. IXICO continues to win contracts, having announced awards with two biopharmaceutical companies earlier this year to provide its technology-enabled imaging services to support an early-phase study in Huntington’s disease and a phase III study in another rare neurological disease. The contracts were the first to be signed with these clients. The Huntington’s disease award is worth £2m over a seven-year term.

Growth therapeutic areas for drug development

Another major drug development area IXICO is targeting is Alzheimer’s disease, a chronic neurodegenerative disease and major cause of dementia. Contract work in this area accounted for around 40 per cent of IXICO’s revenue in 2018.

US costs associated with Alzheimer’s diseases and other dementias

Cost segment	Percentage
Medicare	50
Medicaid	17
Out-of-pocket	22
Other	11

Source: US Alzheimer’s Association

There are around 29.8m people worldwide living with the disease and it is now the leading cause of mortality in the UK. In the US, around 5.7m people are already living with the disease and this is set to rise sharply given the country's ageing population. In fact, academics estimate that there could be 7.1m confirmed cases by 2025, a figure that could almost double to 13.8m by 2050. There are currently no treatments to halt or reverse its progression.

Care costs are rising sharply, too. The US Alzheimer's Association estimates that in 2018 it cost \$277bn to care for the country's Alzheimer sufferers or those with other forms of dementia and this figure is set to quadruple to \$1.1 trillion by 2050.

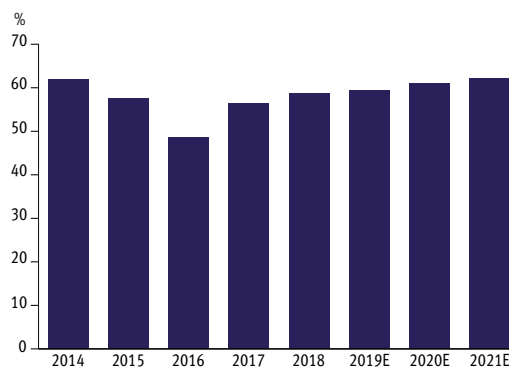
In the circumstances, it's hardly surprising that clinical development focused on Alzheimer's disease is a very active area for the biopharmaceutical industry. There are 218 active studies in phase II or phase III trials, according to ClinicalTrials.gov, and of those an estimated 40 phase II and 20 phase III development trials are being undertaken by biopharmaceutical companies.

The other two major areas of focus for IXICO are Parkinson's disease and multiple sclerosis. In aggregate, they accounted for over a quarter of the company's revenue in 2018. Parkinson's disease is the second most common neurodegenerative disease, after Alzheimer's disease. An estimated 7m to 10m sufferers are living with the disease worldwide, including 930,000 confirmed cases in the US. There has been significant research over the past 50 years, resulting in important discoveries and treatments which provide relief. IXICO first supported a clinical study for Parkinson's disease in 2016 and continues to invest in technological solutions to support clinical trials in this area.

Understanding the business

IXICO's proprietary data analysis is the key differentiating factor for the company and also the reason why it boasts such high gross margins of around 60 per cent as this business segment is more profitable than lower-margin CRO services. It's not the only differentiating factor.

IXICO's gross margins on the rise



Source: IXICO's annual report and accounts; Cenkos Securities forecasts

IXICO's gross margins on the rise

Financial year to 30 September	Revenue	Gross profit	Gross profit margin
2014	£3.4m	£2.1m	61.9%
2015	£3.1m	£1.8m	57.6%
2016	£3.3m	£1.6m	48.7%
2017	£4.1m	£2.3m	56.4%
2018	£5.4m	£3.2m	58.8%
2019E	£6.6m	£3.9m	59.3%
2020E	£8.0m	£4.9m	60.9%
2021E	£9.6m	£5.9m	62.2%

Source: IXICO's annual report and accounts, Cenkos Securities forecasts.

“IXICO’s engagement at the highest level with the pharmaceutical industry has created a moat around the business and a high level of client retention”

Importantly, the business model is highly scalable and has created a moat, too. That’s because IXICO works with clinical trial imaging centres across the globe to ensure that it receives high-quality, reproducible medical images to apply its data analytics to. The company trains staff in the imaging centres on the correct management and positioning of patients remotely from its London headquarters. To date IXICO has worked with more than 1,500 imaging sites across 50 countries and provides both imaging and biomarker data analysis to a number of high-profile academic research consortia which are backed by key academic institutions and representatives of leading industry players such as Eli Lilly, Novartis, Roche and Takeda. Work on these programmes has enabled IXICO to raise its profile in the industry, and gain a competitive advantage over rivals.

For instance, the company is in partnership with Biogen, a US biotechnology corporation specialising in the discovery, development and delivery of therapies for the treatment of neurodegenerative and autoimmune diseases to develop and pilot a post-marketing surveillance service based on IXICO’s radiology reading service (Assessa) for the safety of patients receiving the drug Tysabri (natalizumab), which treats multiple sclerosis sufferers. The platform offers a remote, second opinion to support the decision of the treating physician by utilising specific MRI scans and clinical data to assess the patient risk of developing a condition, leukoencephalopathy, a rare but serious side effect of immunosuppressive treatment for multiple sclerosis.

IXICO’s engagement at the highest level with the pharmaceutical industry, not to mention its proprietary cutting-edge technology, has created a moat around the business and a high level of client retention, too. To put this into perspective, the company has made 22 contract announcements in the past five years, of which seven were contract extensions and an additional five were new agreements with existing clients. This suggests a high level of customer satisfaction with IXICO’s service offering, and potentially one that is now embedded in these clients’ trial protocols.

Furthermore, the company continues to win new contracts in new therapeutic areas, and has expanded its service offering with its wearable data technology where the company’s algorithms measure sleep, daytime napping and daily activity levels of patients. This is an area that is becoming increasingly important in clinical research as sleep patterns can be used to measure disease progression, and the efficacy of medication. Sleep disturbance is a symptom of many central nervous system disorders including Alzheimer’s and Parkinson’s disease.

“At the end of March, the company retained £7.5m of net cash, a sum equating to half its market capitalisation, so has ample funding to support a scaling up of the business”

Five-point strategic plan to accelerate IXICO to sustainable profitability

In the six months to end March 2019, IXICO moved into profit, reporting a first-half operating profit of £100,000 on revenue of £3.4m. This compares with an operating loss of £500,000 on revenue of £2.7m in the same period of the 2018 financial year, thus highlighting the operating leverage of the business model whereby a high percentage of incremental gross margin earned drops through to operating profit as sales rise. Operating costs were unchanged at £2.5m year on year.

Having got to this inflexion point, the directors want to accelerate investment to maximise the commercial opportunities available to IXICO. In May 2018, the company raised £5.2m net of expenses from an oversubscribed placing of VCT/EIS qualifying investment and ordinary shares at a price of 28p to provide the funding to accelerate development of new products and enter new markets. At the end of March 2019, the company retained £7.5m of net cash, a sum equating to half its market capitalisation, so has ample funding to support a scaling up of the business.

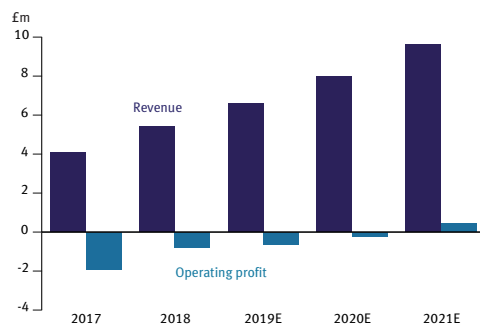
With this in mind, the company’s business development team has been strengthened, and the sales and marketing budget has been increased for the second half of this year. In June 2018, IXICO appointed a chief commercial officer, Alison Howie, to combine leadership of sales and marketing with the company’s innovation programme.

In addition, IXICO made an important strategic hire earlier this year by appointing a new finance director, Grant Nash, who joined IXICO from the UK Biobank (a national and international health research data resource, where he had been finance director since 2014). Mr Grant was also responsible for the UK Biocentre, which provides biomedical sample processing and archiving logistics to large-scale research studies, and was involved in separate fundraisings to raise more than £140m for a variety of research and development projects. Prior to his time with the UK Biobank, Mr Nash spent a decade with drug discovery business Evotec AG, where he was responsible for the finance, IT, procurement facilities and logistics functions.

The five-point growth plan being pursued by the directors involves:

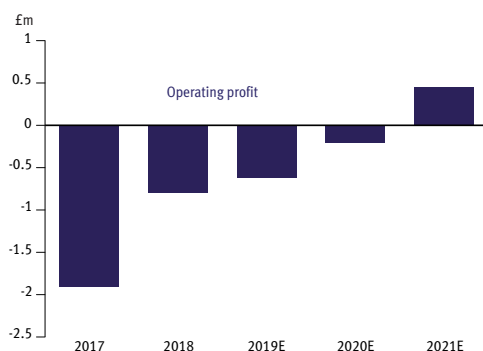
- **Focusing on delivering scale and operational excellence.** The aim is to meet client demands and use new technology to automate processes and capture efficiencies of scale.
- **Accelerate penetration of the global clinical market.** As noted, the company is investing in commercial resources to extend its reach to new clients and in their research and development programmes to drive innovation within neuroscience, where investment in the drug development pipeline is increasing.

IXICO's high margins underpin profitability as business scales up



Source: IXICO's annual report and accounts; Cenkos Securities forecasts

IXICO's pathway to operating profit



Source: IXICO's annual report and accounts; Cenkos Securities forecasts

■ **Target all phases of clinical trials.** As demonstrated in the 2018 financial year when IXICO won £15m of new contracts, it is delivering value to clients across all stages of clinical development programmes by not only expanding existing relationships, but through new contract wins and in larger late-phase studies. Also, IXICO's strategy is to target early-phase trials where the investments and risks are lower, thus increasing the likelihood of the company's technology being included in the trial in the first place. This also means that once IXICO's technology has been validated then it greatly improves the chance of the client working with the company through to the more profitable later-stage clinical trial.

■ **Innovate:** commercialise IXICO's proprietary technologies. The launch of wearable biosensors and other digital platforms highlight the company's innovation and strong focus on monetising its technology.

■ **Enhance organic growth with selective mergers and acquisitions.** IXICO's strategic partnership activities enable the business to enhance its core capabilities in neurology while at the same time accessing adjacent markets.

The aforementioned investments in personnel and higher capital expenditure, which will be ramped up to around £600,000 per year for the 2019, 2020 and 2021 financial years, explains why analysts at house broker Cenkos Securities expect IXICO to report a full-year pre-tax loss of £567,000 on revenue of £6.6m for the 12 months to end September 2019, albeit this still represents an improvement on the prior year when the company reported a pre-tax loss of £793,000 on revenue of £5.4m.

More importantly, analysts believe that assuming the company hits its 20 per cent revenue growth target in the

IXICO's high margins underpin profitability as business scales up

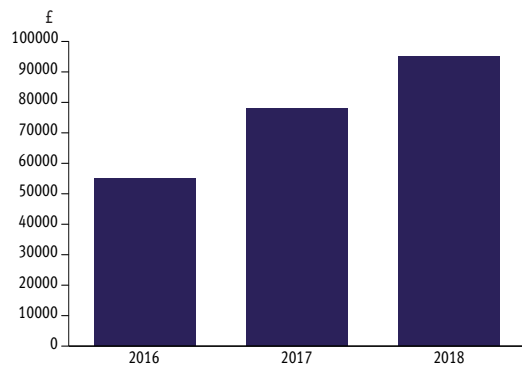
Financial year to 30 Sep	Revenue	Gross profit	Gross profit margin
2017	£4.1m	£2.3m	56.4%
2018	£5.4m	£3.2m	58.8%
2019E	£6.6m	£3.9m	59.3%
2020E	£8.0m	£4.9m	60.9%
2021E	£9.6m	£5.9m	62.2%

High gross margin supports a move to operating profitability as revenues rise....

Financial year to 31 Dec	Revenue	Operating profit	Operating profit margin
2017	£4.1m	-£1.91m	-46.6%
2018	£5.4m	-£0.80m	-14.8%
2019E	£6.6m	-£0.62m	-9.5%
2020E	£8.0m	-£0.21m	-2.6%
2021E	£9.6m	£0.45m	4.7%

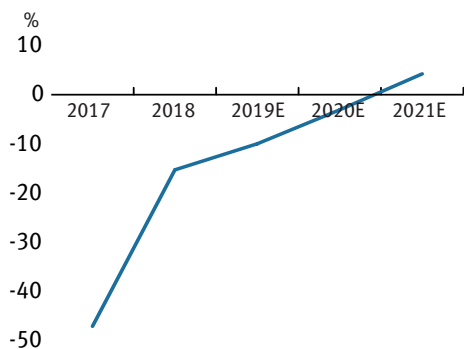
Source: IXICO's annual report and accounts; Cenkos Securities forecasts

IXICO contract revenue visibility



Source: IXICO annual report (2018)

IXICO's operating profit margin improving markedly



Source: IXICO's annual report and accounts; Cenkos Securities forecasts

2020 financial year to post turnover of £8m then a chunk of the incremental £950,000 of additional gross margin earned from the £1.4m additional revenue will be converted into profit to narrow the company's pre-tax loss to only £205,000. This highlights the high operational leverage of the business model.

It's worth noting that two-thirds of the 2020 revenue target of £8m is already covered by the contracted order book, so if contract momentum continues to build then it's not unrealistic to expect IXICO to outperform profit expectations for next year. Indeed, given the significant amount of automation in the workflow and remote management of the clinical trial imaging sites, IXICO will be able to take on additional revenue-generating activities without an equivalent increase in staffing costs. The effect of which is that any outperformance against revenue forecasts will deliver a high conversion rate of incremental gross margin earned to operating profit.

This operational leverage effect is also illustrated by the fact that over the past few years IXICO's staffing levels have remained between 60 and 70 employees even though revenues earned have surged by 65 per cent, from £3.3m in 2016 to £5.4m in 2018.

IXICO revenue per employee

Year	Revenue per employee
2016	£55,000
2017	£78,000
2018	£95,000

Source: IXICO annual report (2018)

To put this operational gearing effect into perspective, assuming that IXICO lands an additional contract worth £500,000 of revenue per year, and maintains its gross margin at 60 per cent, then it should be able to make an operating profit of around £200,000 per year over the life of the contract after expensing annual operating expenses of around £100,000 in order to service it.

In other words, an operating margin of 40 per cent is a realistic target on new contract work and a strong indicator of the future trajectory of IXICO's margins when the company moves into sustainable profitability. Although Cenkos believes that could happen in the 2021 financial year, given the conservative nature of its revenue forecasts, a move into profitability in the 2020 financial year is a real possibility.

Meet the management

IXICO's board is chaired by **Charles Spicer**, an experienced director and adviser to public and private companies primarily in the medtech and life science sectors. He is also non-executive chairman of Realm Therapeutics, a company that is in the process of being acquired by Nasdaq-listed ESSA Pharma (US:EPIX), medical devices company Creo Medical (CREO) and 11 Health Technologies Limited. Mr Spicer chairs the UK Department of Health Invention for Innovation Funding Panel, a reflection of his standing in the industry. Clearly, Mr Spicer sees the investment potential of IXICO, having splashed out almost £40,000 earlier this month purchasing 140,241 shares in the company to more than double his stake to 333,196 shares (representing 0.71 per cent of the issued share capital).

Admittedly, **Mr Cerroni** has a modest shareholding of 84,850 shares, representing 0.2 per cent of the share capital, but he also has 676,582 share options that are exercisable at 36.5p each and 1.17m options with an exercise price of 10p that expire in May 2024, so is heavily incentivised to move IXICO into sustainable profitability to support a higher valuation of the company.

The three non-executive directors, **Tim Sharpington**, **Mark Warne** and **John Bradshaw**, own a modest 56,000 shares between them, but more importantly they have relevant industry experience. Mr Sharpington has more than 25 years' experience in the life sciences sector with various pharmaceutical, biotechnology and pharma-

ceutical service companies in Europe and the US. He is currently chief operating officer at Aim-traded hVIVO (HVO), a life sciences business pioneering a technology platform of human disease models to accelerate drug discovery and development. Mr Sharpington was previously executive vice president at Vectura (VEC), a £500m-plus market capitalisation UK company engaged in research, development and commercialisation of therapeutic products and drug delivery systems for human use. Prior to that he was chief executive at Phytopharm, the cash shell that IXICO reversed into when it listed on Aim in October 2013.

Mr Warne is currently chief executive of Aim-traded DeepMatter (DMTR), a company engaged in the digitisation of chemical space coupled with chemical drug discovery, having previously spent almost a decade at IP Group (IPO), a leading intellectual property commercialisation company, where he led the healthcare team. He is also a non-executive director of hVIVO.

Mr Bradshaw has more than 20 years' experience as a chief financial officer with venture-capital-backed and listed companies. He is the chief financial officer of Syncona Investment Management, and a non-executive director and audit committee chair of Aim-traded Creo Medical (CREO). In total the board was paid a combined base salary of £621,000 in the 2018 financial year and received bonuses of £336,650 to account for a third of the company's overall administration costs of £2.75m.

“Notable investors on the share register include Gresham House Asset Management, Octopus Investments and Amati Global Investors”

Major shareholders

It’s worth noting that following the release of the company’s half-year financial results in late May there were some major changes on the share register. IP Group sold its 24 per cent stake, and Invesco sold down its 13 per cent stake to below 3 per cent. The shares were placed with BGF Investment Management, formerly the British Growth Fund, which acquired a 20 per cent shareholding, Canaccord Genuity (11 per cent) and private investor Brett Gordon (3.3 per cent).

This is actually a positive development as it clears a stock overhang. It’s worth noting that BGF has deployed £1.9bn of its £2.5bn balance sheet capital to invest in 275 individual companies since 2011. Out of that sum, more than £500m of follow-on investments were made, highlighting its long-term approach to patient capital.

Other notable investors on the share register include Gresham House Asset Management, Octopus Investments and Amati Global Investors. In aggregate the top six shareholders control over 70 per cent of the 46.7m shares in issue, which reduces liquidity somewhat. However, it is still possible to trade the shares in market orders well in excess of the 1,500 normal market size and between the bid-offer spread, too. If you are looking to build a significant holding then it may be sensible to split your order into smaller bargain sizes to achieve the best market prices possible.

Clearly, the reduced liquidity means that share price movements will be more accentuated in reaction to newsflow. That’s set to work in investors’ favour given the potential for IXICO to outperform the house broker’s conservative looking forecasts in 2020 and 2021. However, it’s also worth considering the potential for an accentuated drop in the share price if IXICO misses guidance, albeit that seems a remote possibility given the contract revenue visibility from the £21.2m contracted order book.

IXICO major shareholders

Shareholders	Shares held	Percentage stake
BGF Investment Management	9,354,000	20.0
Octopus Investments	6,708,400	14.3
Gresham House Asset Management (formerly Livingbridge)	5,357,100	11.5
Canaccord Genuity Wealth Management	5,127,100	11.0
Amati Global Investors	5,031,300	10.8
Brett Gordon	1,545,000	3.3
Total		70.9%

Source: IXICO, and London Stock Exchange RNS.

Peer group comparison

The Aim CRO peer group is pretty limited with only two other companies listed, **Hvivo (HVO)** and **Ergomed (ERGO)**, a provider of drug development services to the pharmaceutical industry through two business segments: clinical research services, and drug safety and medical information services. These companies are really not comparables given that it is IXICO's proprietary AI data analytics business that is driving the company's gross margin and its move into profit.

A far better valuation comparison can be made with a technology-based peer group, the majority of which have yet to move into profit, so an enterprise valuation to sales multiple is the key metric as it highlights the valuation multiple for each pound of revenue after deducting each company's cash position from its market capitalisation. On this basis, IXICO compares very favourably with its peers.

For instance, **RenalytixAI (RENX)**, a pioneering developer of AI-enabled clinical diagnostic solutions for kidney disease, one of the most common and costly chronic medical conditions globally, is lossmaking and is not expected to report meaningful sales for several years, albeit the spike in the share price since IPO in November highlights its commercial prospects.

Sensyne Health (SENS), a healthcare technology company that creates value from accelerating the discovery and development of new medicines and improving patient care through the analysis of real-world evidence from large databases of anonymised patient data in collaboration with NHS trusts, is a good comparable with IXICO. However, even though corporate broker Peel Hunt expects Sensyne's revenues to surge from £100,000 in 2018 to £12.5m in 2021, it is forecast to accumulate aggregate pre-tax losses of £43.6m in the next three financial years, including a pre-tax loss of £8.5m in 2021, whereas IXICO is on course to report an operating profit of £445,000 in the 2021 financial year. Moreover, investors are effectively paying 1.25 times IXICO's forecast 2021 revenue of £9.6m for a slice of the action, whereas the £60m gross proceeds Sensyne raised at the time of its Aim IPO in August 2018 will have halved to £31m by the end of 2021. This means that effectively Sensyne has a 2021 enterprise valuation of

IXICO peer group comparison

	IXICO	RenalytixAI	Sensyne Health	Cambridge Cognition	C4X Discovery	Medica Group	Instem
Share price	33p	314p	159p	60p	50p	123p	360p
Market value	£15.4m	£168.9m	£204.5m	£14.5m	£28.6m	£136.7m	£58.7m
Enterprise value	£7.9m	£158.5m	£146.8m	£10.9m	£19.4m	£136.0m	£55.1m
EV/Sales 2018	1.5	na	1467.7	1.8	2.8	3.5	2.4
EV/Sales 2019e	1.5	na	244.6	1.3	na	3.1	2.0

Source: IXICO (Cenkos Securities); Cambridge Cognition (FinnCap); C4X Discovery (Panmure Gordon); Instem and RenalytixAI (N+1 Singer); Medica and Sensyne Health (Peel Hunt)

“This is a business capable of generating an operating profit margin of 40 per cent on new contract awards once it has moved into profit”

£173m, so is trading on almost 14 times that year’s expected sales of £12.5m.

Cambridge Cognition (COG), another Aim-traded company that has developed a suite of computer-based cognitive assessments to improve the understanding, diagnosis and treatment of neurological and psychological diseases, is another good comparable. The company is also targeting the higher-margin data analytics market, through its wearable Apple Watch technology to measure cognition health and NeuroVocalix, a voice biomarker that enables the remote assessment of voice-based cognitive measures.

Cambridge Cognition’s enterprise value to sales multiple is similar to that of IXICO and both companies boast high gross margins. Like IXICO, a high proportion of the company’s gross margin will drop through to operating profit as the operational leverage of the business kicks in, thus offering scope for accelerated profit growth once this inflexion point is reached. That point has yet to be reached though, but as I highlighted last month the risk:reward ratio appears favourable to warrant a higher valuation for its equity (‘Cambridge Cognition gaining recognition’, 14 June 2019).

Ultimately, paying a multiple of 1.25 forecast sales a couple of years out is a sensible entry point if a company can turn profitable at that point and then deliver significantly higher operating profits on rising revenue thereafter. IXICO fits the bill in this regard, and its equity is attractively priced, too.

Target price

Having taken all the risk factors below into consideration, I feel that a target price of 55p a share is warranted for IXICO's equity, implying a target market capitalisation of £25.7m and an enterprise valuation of £22.25m by September 2021 when the company is forecast to have net funds of £3.45m and deliver operating profits of £445,000. My target enterprise valuation equates to a reasonable 2.3 times forecast revenues of £9.6m in 2021, but if IXICO continues to win contracts at the current pace then there is a realistic chance of a move into profit well before then.

Indeed, as illustrated earlier, this is a business capable of generating an operating profit margin of 40 per cent on new contract awards once it has moved into profit. Or put another way, IXICO's 2021 forecast operating profit of £445,000 would almost double to £845,000 if revenues outperform consensus by only 10 per cent. BGF has backed a potential winner here, and it's worth following its lead.

Risk assessment

Of course, no investment is without risk and there are several to consider here:

■ **Financial.** The path to profitability depends upon the successful execution of the board's five-point growth strategy. Adverse events could affect profitability and the company's ability to meet financial targets. However, the £21.2m contracted order has strengthened the order book, and the £5.2m net proceeds of the placing in May 2018 means that the company's cash position is sufficient to support higher levels of capital expenditure, investment in the business and the working capital requirements to deliver an increasingly higher level of annual revenue.

■ **Management and employees.** The loss of key employees could weaken IXICO's scientific, technical and management capabilities and negatively impact the business.

■ **Industry.** Clinical trials, and therefore IXICO's client contracts, can be stopped at any time if the drug is deemed not effective or unsafe. There is a risk of reduced revenue as a result of the timing or reduction of expenditure by biopharmaceutical clients.

This happened in June 2018 when one of its pharmaceutical clients took the decision to stop the screening, randomisation and dosing in a Phase II/III clinical study in Alzheimer's disease in which IXICO was providing specialist imaging clinical trial services.

To mitigate this risk, IXICO continues to strengthen its market position and sustain a competitive advantage by building collaborative, commercial partnerships. It is also diversifying its revenue stream by expanding into new therapeutic areas, which provides some mitigation against

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changing funding priorities within neurology. Moreover, the majority of clinical studies for neurological conditions span multiple years, which is reflected in existing client contracts, thus mitigating the short-term risk of changes to their funding priorities.

■ **Competition.** IXICO faces competition that may impact the company’s ability to implement its commercially-led growth strategy. As a technology services provider there is always the risk of new disruptive technologies that could render IXICO’s technology uncompetitive.

■ **Brexit.** Revenue from non-UK, European clients represented less than 20 per cent of the total in 2018, thus reducing IXICO’s exposure to any trading challenges as a consequence of Brexit. In fact, almost 73 per cent of the company’s revenue of £5.4m in 2018 was derived from the US, giving IXICO substantial and valuable US dollar-denominated earnings. In the event of a hard Brexit, and subsequent sterling weakness, these international earnings are set to become even more valuable given IXICO does not make use of financial instruments to minimise any foreign exchange gains or losses. Earnings from European clients accounted for 17.6 per cent of revenue, China around 0.7 per cent, with less than 9 per cent of revenue derived from the UK. It’s not the only Brexit factor to consider, though. That’s because the company manages data across multi-national territories, storing these on UK-based servers. Post-Brexit, data management requirements may change, but even if this occurs the company can switch to EU-based data storage providers in order to satisfy data management requirements changes.

Admittedly, there is considerable uncertainty in the macroeconomic outlook as a result of the UK’s decision to leave the EU. IXICO recruits staff who are not UK nationals and post-Brexit residency and work rights for non-UK nationals may affect its ability to attract and retain qualified staff in the future. That said, given the salary levels of IXICO’s most valuable employees, it should still be able to successfully apply for work permits for new overseas staff to meet the proposed levels of remuneration based criteria.

■ **Regulatory and compliance.** IXICO operates in a regulated environment and changes to regulations could negatively impact the board’s ability to implement the five-point growth strategy. To mitigate this risk, management monitors potential regulatory changes and participates in industry bodies so that the company can manage change accordingly. It has also invested in additional senior resource in its quality and compliance team. The company’s quality management system has been certified to ISO9001:2008 and ISO13485:2003 standards.

IXICO’s technologies for use in clinical trials have been

developed to comply with regulatory standards across several jurisdictions. The directors believe that IXICO's significant familiarity with these regulatory environments represents a key element of its expertise and acts as a significant barrier to entry for less specialised potential competitors.

■ **Reliance on key customers.** IXICO works closely with clients to ensure that it delivers to their requirements. The biopharmaceutical industry has consolidated over the past 20 years, leading to concentration of revenue in a relatively small client base. Indeed, in the 2018 financial year, three of IXICO's customers accounted for 39 per cent of the company's revenue between them.

The mitigating factor is that revenue is derived from multi-year contracts, and a large number of existing clients have been placing new business with the company, thus highlighting a high level of customer satisfaction. Also, customer concentration risk will diminish as IXICO's revenue scales up and diversifies as new entrants, such as smaller biotechnology companies, enter into a broadening market.

■ **Intellectual property and proprietary technology.** IXICO's technologies are based on software and data algorithms, which may present a lower barrier to competition than other forms of intellectual property protection.

However, successful development and deployment of these technologies are reliant on considerable know-how in neuroscience, data analytics and image analysis. Copyright in the software incorporated into IXICO's products is a further form of potential protection. In addition, the company manages, develops and protects its intellectual property portfolio and maintains business know-how and knowledge in quality management systems and standard operating procedures.

■ **Cybersecurity.** IXICO collects, manages and analyses clinical data from international trial sites. The introduction of the EU general data protection regulations (GDPR) has had a material impact on the requirements for the collection, storage and management of personal data. The company has responded to the changes in data privacy regulations to ensure compliance and conducts regular reviews to ensure systems are robust. For instance, IXICO's TrialTracker software is designed to anonymise patient data at the point of source, minimising the risk in the event of a cybersecurity breach.

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