



This is a marketing communication. Please refer to the prospectus and KIID for the Fund before making any final investment decisions. Past performance does not predict future returns.

ABOUT THE FUND Launch 19.12.2013 Benchmark MSCI AC Pacific ex Japan Sector IA Asia Pacific Excluding Japan Edmund Harriss (Co-manager) Mark Hammonds (Co-manager) Sharukh Malik

Aim

The Guinness Asian Equity Income Fund is designed to provide investors with exposure to high quality dividend-paying companies in the Asia Pacific region. The Fund aims to provide long-term capital appreciation and a source of income that has the potential to grow over time. The Fund is actively managed and uses the MSCI AC Pacific ex Japan index as a comparator benchmark only.

| RISK | | | | | | | |
|------------------------|---|---|---|---|---|---------|--|
| Lower Risk Higher Risk | | | | | | er Risk | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | |

Typically lower rewards

Typically higher rewards

The risk and reward indicator shows where the Fund ranks in terms of its potential risk and return. The Fund has been classed as 6 because its volatility has been measured as above average to high. Historic data may not be a reliable indicator for the future. The Fund is an equity fund. Investors should be willing and able to assume the risks of equity investing. The value of an investment and the income from it can fall as well as rise as a result of market and currency movement, and you may not get back the amount originally invested.

PERFORMANCE

Past performance does not predict future returns.

| 30/11/2022 | 1 Yr | 3 Yrs | 5 Yrs | Launch* |
|------------|------|-------|-------|---------|
| Fund (%) | -3.5 | 10.6 | 13.6 | 115.1 |
| Index (%) | -8.6 | 8.2 | 12.9 | 82.8 |
| Sector (%) | -6.1 | 17.2 | 22.0 | 100.5 |

Full discrete 12m performance is shown at the end of this commentary. Source: FE fundinfo, bid to bid, total return. *Launch: 19/12/2013. Investors should note that fees and expenses are charged to the capital of the Fund. This reduces the return on your investment by an amount equivalent to the Ongoing Charges Figure (OCF). The fund performance shown has been reduced by the current OCF of 0.89% per annum. Returns for share classes with a different OCF will vary accordingly. The performance returns do not reflect any initial charge; any such charge will also reduce the return.

REVIEW

In November, the Fund rose 13.7% (Y share class, in GBP) compared to MSCI AC Pacific ex Japan Net Total Return Index benchmark which rose 15.9%.

Over the year to date the Fund has fallen -6.7% versus the benchmark index which has fallen -7.9%.

Asian markets rebounded in November following October's sharp sell-off. Once the Party Congress was out of the way in China and the US mid-term elections secured the Senate once again for the Democrats, a way opened up for Xi Jinping and President Biden if not to reset then at least stabilise US-China relations. As we also expected, China began to ease up on some of the Covid restrictions. What none of us anticipated was the sudden outbreak of widespread protests which caused the government to cave in and move much faster than they intended, to abandon zero-Covid and re-focus on growth.

A notable feature of regional market performance has been the weakness in North Asia versus South and Southeast Asia. In the year to October, China, Korea and Taiwan were down 43%, 35% and 39% in US dollar terms as measured by the respective MSCI country indices. Unsurprisingly, these were the markets that bounced most in the past month, with China up 30% and Taiwan up 22%. The Korean market was up 15%, only a little better than the rest of region. This reflects the different dynamics at play: supply disruptions and geopolitics have been significant factors. In Korea, weaker global demand weighs on the export sector, but there are also concerns about the amount of debt built up, in common with developed markets during the ultralow interest rate period. The default by the developer of a Legoland theme park in Korea triggered the biggest drop in the domestic credit market, estimated to be worth around \$1 trillion, since the global financial crisis.



Interest rates moved up in Korea (up 0.25% to 3.25%) Indonesia (up 0.5% to 5.25%), the Philippines (up 0.75% to 5%) and Thailand (up 0.25% to 1.25%). Since the end of the month India has raised rates 0.35% up to 6.35% and Australia up 0.25% to 3.1%. Our sense is that inflation pressures remain elevated in India, Indonesia and the Philippines but appear to be moderating in Australia, Korea and Malaysia. Thailand has some of the lowest interest rates in the region, but pressures are likely to intensify as the economy opens and tourists return. China remains the exception as counter-cyclical easing to support growth is the likely outcome, in our view.

Stock performance in the portfolio was led by Ping An Insurance, China Merchants Bank, China Overseas Land & Investment and China Resources Gas. Elite Material Co, a Taiwanese manufacturer of laminates for printed circuit boards with significant manufacturing operations in China, also rebounded. An improvement in the geopolitical outlook, especially in respect of Taiwan, lifted the performance of Taiwan Semiconductor Manufacturing Co (TSMC). However, there was also company-specific news over the period that lifted stocks like Largan Precision and Novatek Microelectronics which have generated renewed sales growth momentum in recent months.

Two companies reported results in November. Link REIT reported first half revenue up 4.6% with a resilient Hong Kong portfolio offset somewhat by weakness in China. The company declared a core dividend that was equal to last year's. Metcash, a grocery retailer and wholesaler in Australia, reported 9.5% sales growth and 11% growth in operating profit. The company has held on to customers it won during Covid and has added a retail hardware business in recent years that is also performing well, although it is more working capital intensive. The company declared a 9.5% increase in the interim dividend which delivers a 12.5% increase for the calendar year.

The reports from these two companies now mean that we have seen all dividend declarations for 2022. Out of our 36 holdings, 25 companies increased (including the resumption by Corporate Travel management), four were unchanged and seven fell. The rises were in the 2% to 230% range and the declines were in the range of -2% to -25%.

The near-term outlook is expected to be influenced by the progress made by China in restarting its economy against the backdrop of the possibility of recession in Europe and US. Supply disruptions and ongoing restrictions on certain goods between China and the US will continue to niggle but, in our view, it is global demand that will be the biggest factor. Recent trade figures from China disappointed the market, but clearly this cannot be attributed just to China domestic conditions; exports from Taiwan and Korea have also recorded significant 8% year-on-year declines.

When seeking to look through the short-term twists and turns in market sentiment, we see a world in which US interest rates continue to rise until the Federal Reserve is a sure as it can be that inflation pressures are under control; in the meantime, the prospect of recession in 2023 remains a real possibility before recovery in 2024, which we would expect markets to focus upon around mid-year. Longer-term we would expect the US economy to settle back to (nominal) trend growth of 4% to 5%, assuming inflation of 2% to 3% and Fed Funds rate to remain around 4%. The US yield curve, in this world, could be steeper than in the past as greater uncertainty about future inflation outbreaks, and could raise the term premium materially (could be as much as 1%+) on longer-dated bonds.

This environment would be more beneficial to lenders and investors and less beneficial to borrowers. Banks would be likely to see wider spreads and insurance companies would see better income streams from their investment portfolios. By contrast, borrowers looking to refinance will see higher interest rates. This scenario suggests that companies whose inherent strengths, leading to greater cash generation, will likely do better operationally than those requiring significant borrowings to grow. Higher bond yields mean higher discount rates applied to equity valuation models than in the recent 10-year past, which would act as cap on valuation expansion. This would place the onus on profits, cash flows and dividends to drive stock performance. This is what our investment philosophy and process is designed to deliver.

MACRO REVIEW

Chinese stocks have been the weakest performers in the regional benchmark this year, but things are changing fast. Last month we highlighted the conclusion of the Party Congress after which, we argued, Xi Jinping would



have the political freedom to move on domestic policy and on international engagement especially with the US. We did indeed see both of these play out. At the G20 meeting in Bali, Xi Jinping met with President Biden for three hours and while there was a restatement of existing positions there were also common positions adopted on use of nuclear weapons and Ukraine and on climate, for example. Olaf Scholz of Germany was the first foreign leader to visit China after the Congress, and one of the most significant shifts, in our view, was the announcement at the time that foreign-made Covid vaccines would be accepted, albeit for foreigners only. This marked the beginning of a process to ease domestic zero-Covid measures which we expected to continue gradually into next year alongside the introduction of a domestic mRNA vaccine.

This gradualist scenario was upended by the wave of popular protests across China following the deaths in an apartment fire of people who were unable to escape because they had been confined to the building as part the Covid lockdown policy. Broad-based protests with common cause are the stuff of nightmares for the Chinese government which, following moves to suppress, caved in and went rapidly into reverse. Covid restrictions are easing across China, with local officials given firm direction. Once again, we are reminded of the primacy to the leadership of social stability in directing short-term policy.

There are fears in some quarters that this will now lead to rapid increases in case numbers. Around 15% of the over-60's population are unvaccinated, and based on the Hong Kong experience, in the event of contracting Covid 6.3% of that group or up to 2.5 million people could require hospitalisation. In that context, the government is making strenuous efforts to address the stalled vaccination programme. Longer-term policy is shaped by the 'deal' between the governors and the governed, which is to improve the standard of living in order to remain in power. Following the protests, the government has now made its choice and reversed its short-term priorities. Growth, over zero-Covid, is likely to be the leading policy aim, with 5% growth next year being touted as a target.

Economic issues must have been dominating discussions in any case, in recent months. Lockdowns and mass testing all cost money, and local governments have been running short of cash, unable to supplement revenues through land sales as the clamp-down on the residential development sector continues. According to Bloomberg's Shuli Ren, China's fiscal deficit (the gap between tax revenue and spending) this year, if unmanaged, could reach a new high of RMB 4 trillion (\$570 billion), over 20% of GDP. It is unlikely to end that way because there are funding options: front-load part of 2023's budget; local governments can issue bonds utilising unused quotas in 2019-21 (up to RMB 1.5 trillion); and there is also around RMB 1.6 trillion available from last year's fiscal budget. This could go a long way toward balancing the books for this year. But the economy now needs to grow to be put back onto a sustainable footing.

The two other weakest markets in the region this year have been Korea and Taiwan. Trade numbers may still be positive for the year to November, but figures for the most recent month were down -13% for Taiwan and -14% for Korea compared with the same period last year. China policies have been cited as a drag, but company managements are focusing more attention on global demand conditions which are weakening.





Sources: China Customs, Taiwan Ministry of Finance, Korea Ministry of Trade, Enterprise Singapore, Bank of Thailand; in USD terms

Another developing trend we are seeing is the diversification of supply chains turning into localisation of production: globalisation going partially into reverse. It is too early to say how far this will go. The process appears to be addressed at concerns over security of supply chains, either to minimise supply disruptions or to preserve intellectual property, or both. The core supply issues being talked about are in the technology area, where the Taiwanese are especially skilled, and these changes are not necessarily to their disadvantage. Taiwan Semiconductor Manufacturing (TSMC) for example, had already committed to build a new plant in Arizona and has now scaled this up to incorporate \$40 billion of spending and using the most advanced production processes which had hitherto remained in Taiwan. We need hardly add that they are receiving significant financial incentives to do so.

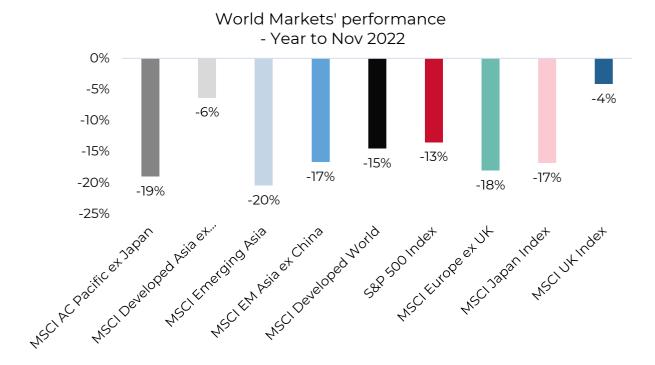
Nevertheless, we also see other industries seeking to secure supply as China concentration risk became evident from the lockdowns. Emerging markets in Latin America and, in time, Europe are likely to benefit as security from proximity to end markets is seen to outweigh higher costs. The implications of this could be a pick-up in the capital spending cycle, and with higher supply chain costs, a reduction of the disinflationary forces that helped keep product prices lower from the mid-1990s up to the pandemic.

Another more positive view could be that this process is not one of fragmentation but the creation of more complex production network whose benefits include higher latency (meaning alternative routes are available in times of stress) and therefore greater robustness. Many but not all of the manufacturers we hold in the Fund already incorporate this: aside from TSMC, Nien Made Enterprises services the US market from Mexico; Shenzhou International operates factories in Vietnam and Cambodia; and Hon Hai Precision has been investing heavily in India and the US. Elite Material Co is one company we hold that has yet to make that shift and has three factories in Taiwan and two in China, where the company's operations have experienced disruption this year especially.

MARKET REVIEW

The Asian regional benchmark snapped back in November rising 19.9% in dollar terms outstripping broad developed and Emerging markets. This rebound recaptured some of the losses suffered in October. Year-to-date performance in dollar terms across the regions to 30^{th} November can be seen in the chart below.





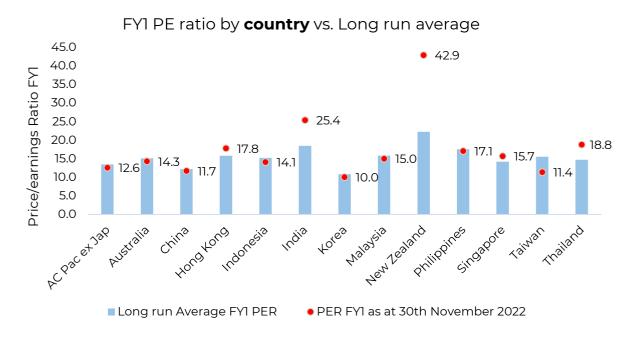
Data as of 30 November 2022, net returns in US dollars.

China, Hong Kong and Taiwan led the way, rising 29.7%, 24.5% and 22.2% respectively in dollar terms, as measured by the respective MSCI country indices. Korea, the other weak market this year, lagged the benchmark but still climbed 14.4%.

Domestic Korean credit markets have tightened since September, when a local developer of the Legoland theme park missed a payment. The background is less straightforward than first appears: the type of financing used is called Project Financing – Asset-Backed Commercial Paper (PF-ABCP). It is not entirely safe but is commonly used in the Korean construction industry. Defaults are rare (0.5% default rate according to the Bank of Korea). The Paper is usually backed by the brokerage that issued it or by the builder. In this case it was backed by Gangwon province, where the park is being built. However, the newly elected provincial governor refused to honour the debt, which had been agreed under his predecessor, a political opponent. This sparked chaos in the local credit markets, pushing yields to highest levels since the Global Financial Crisis. The problem has since been ringfenced and the market has stabilised, but local investors are jumpy.

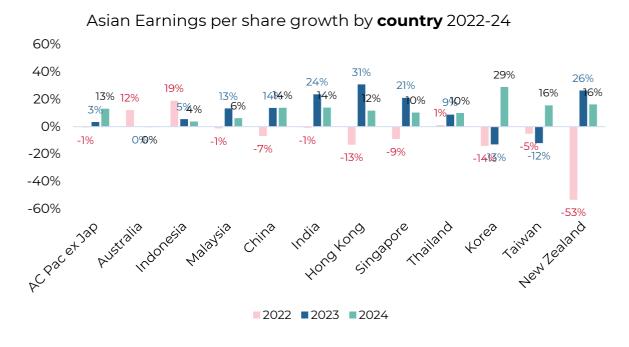
After the regional rally, most Asian markets are still trading at or below their long-run (15-year) averages when looking at their price-earnings multiples based on consensus estimated earnings for 2022. The exceptions are India, whose strong performance has been the mirror image to that of China, Hong Kong, Singapore and Thailand.





Figures based on MSCI AC Pacific ex Japan Index, MSCI country indices and consensus estimated earnings for 2022 in US dollars as of 30th November 2022.

The earnings growth profile for these markets, based on consensus estimates is shown in the chart below:



Figures based on MSCI AC Pacific ex Japan Index, MSCI country indices and consensus estimated earnings for 2022 in US dollars as of 30th November 2022.

The commodity-heavy markets of Australia, Indonesia and Malaysia tend to exhibit stronger near-term growth followed by a fade. China and India have a similar growth profile (when we account for the fact that India's 2023



growth is in fact for the 12 months ending 31st March 2023) but are trading on markedly different valuations. Hong Kong, Singapore (the two city states) and Thailand are re-opening stories which in the cases of the latter two have been anticipated to some extent by the market, hence the valuation premium to the average. Finally, Korea and Taiwan estimates appear to reflect expectations of developed market recession in 2023 before a recovery in 2024.

This last point is interesting because while Asian estimates appear to have price in weaker conditions, estimates for the US seem to us to be more optimistic. The consensus is still looking for 7% earnings growth for the S&P 500 Index, but increasingly we are seeing forecasts of flat to declining earnings depending on the forecasters' stance on recession next year. We think that there are further earnings downgrades to come for the US, whereas we think Asia is a lot further along in the earnings downgrade cycle.

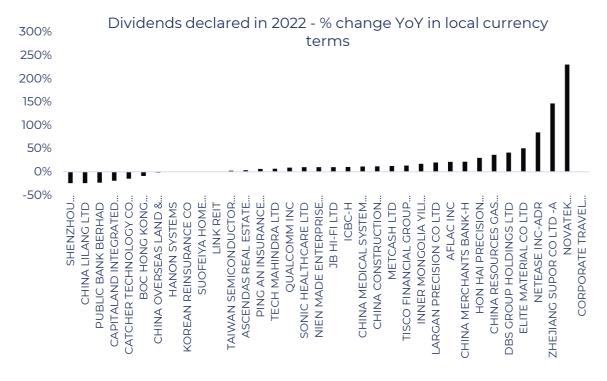
PORTFOLIO HOLDINGS

Two stocks, Link REIT and Metcash, reported results and declared interim dividends.

Link REIT reported in-line results with first half revenue up 4.6% and a resilient Hong Kong portfolio offset somewhat by weakness in China. The headline distribution was down 3% year-on-year but that included a special return of capital. The basic dividend per share was unchanged on last year.

Metcash, (Grocery/hardware retail and retail distribution, Australia) reported results for the first half of its financial year, which ends in June. The dividend per share rose +9.5% year-on-year, bringing full calendar year distribution up 12.5% year-on-year. Local store format was a beneficiary in Covid conditions, and it looks like they have managed to hold on to customers. The company has been developing its branded grocery store retail chain alongside its wholesale business. The acquisition of a hardware business has added extra growth and increased margins but is more capital intensive. In spite of the extra working capital requirement, debt ratios are coming down on stronger free cash flow generation.

Following the dividend declarations by all the companies in the portfolio the year-on-year comparison for company dividends in local currency terms is below:



Sources: Company reports. Dividends declared and paid in 2022 in local currency terms.



OUTLOOK

China's sharp change in direction now creates the possibility of a return to faster economic growth, with a 5% growth figure being touted. There is, however, the risk of a rapid increase in Covid cases, and while China's domestic vaccine exhibits similar efficacy to Western versions with three doses, the problem is one of low vaccine take-up especially amongst the older generation. Now that the government's hand has been forced, they are seeking to accelerate the vaccination programme, but they also need to prepare for a sharp rise in hospitalisations and fatalities in the meantime.

North Asian stocks have begun to move, and across the region the stock focus is more heavily oriented toward domestic plays and specialised manufacturers into the export market. There is a real possibility that the developed world could be in recession next year, and although it could be comparatively shallow, that will not necessarily protect stocks. The dynamic here needs to be understood in terms of operational impact on earnings (and dividends) and then on valuations. A drawn-out earnings correction could have a significant long-term impact on stock returns, especially if valuations are too high to begin with.

Asia has an advantage in this respect in that the downdraft exerted by China has already been felt widely on earnings and forecasts have already been adjusted down. Valuations also remain at the low end of the range since 2005. We think that a lot has been priced in, and that while the rest of the world slows, we could see a countercyclical recovery in China. The Fund, as shown in the table below, shows an earnings profile for the next two years that looks fine against Asia and looks good against the developed world in the event of downside to forecasts. And the Fund remains cheap. We do not expect market valuations to drive returns (they haven't contributed positively since the Fund launched, though we live in hope) but for core earnings and dividends to drive portfolio stock prices.

Earnings and valuations

| | EPS CAGR % PER | | | 15Y Average PER | | | |
|-------------------|----------------|------|------|-----------------|------|------|------|
| | 2022-24 | 1FY | 2FY | 3FY | 1FY | 2FY | 3FY |
| | | | | | | | |
| Asian Equity Inc. | 7.5% | 10.3 | 9.8 | 8.9 | | | |
| Benchmark | 8.1% | 12.8 | 12.3 | 10.9 | 13.4 | 11.9 | 10.9 |
| Developed Asia | 6.2% | 15.3 | 14.2 | 13.7 | 15.2 | 13.9 | 12.9 |
| Emerging Asia | 9.5% | 13.1 | 12.6 | 10.9 | 13.1 | 11.4 | 10.2 |
| US | 8.3% | 17.9 | 16.8 | 15.3 | 16.9 | 14.9 | 13.3 |
| Europe ex-UK | 5.5% | 13.4 | 13.0 | 12.0 | 14.3 | 12.6 | 11.4 |
| UK | -0.4% | 9.7 | 9.9 | 9.8 | 13.0 | 11.7 | 10.7 |
| Developed World | 6.4% | 15.9 | 15.1 | 14.0 | 15.9 | 14.0 | 12.6 |

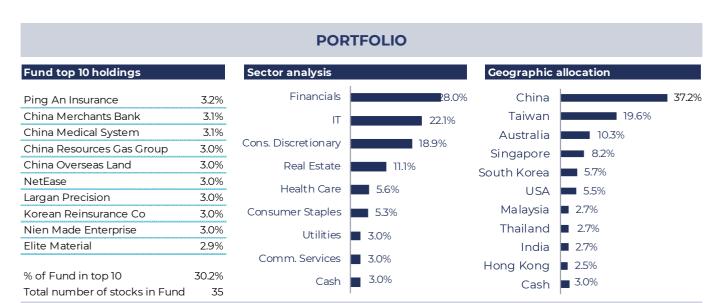
Sources: Guinness Global Investors, Bloomberg. Based on consensus estimates as of 30 November 2022, in US dollars. All Indices are MSCI regional or country indices, except the US, which is measured by the S&P 500 Index. The region is represented by the Fund's benchmark and Developed Asia is measured by MSCI Pacific ex Japan Index, consisting of Australia, New Zealand, Hong Kong and Singapore.

Portfolio managers

Edmund Harriss

Mark Hammonds





PERFORMANCE

Past performance does not predict future returns.

| Discrete 12m % total return (GBP) | Nov '22 | Nov '21 | Nov '20 | Nov '19 | Nov '18 | Nov '17 | Nov '16 | Nov '15 |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Fund (Y class, 0.89% OCF) | -3.5 | 11.63 | 2.60 | 9.33 | -6.01 | 24.09 | 27.44 | 0.10 |
| MSCI AC Pacific ex Japan Index | -8.6 | -0.63 | 19.08 | 8.33 | -3.71 | 21.30 | 31.21 | -7.83 |
| IA Asia Pacific ex Japan | -6.1 | 5.81 | 17.89 | 9.74 | -5.12 | 21.76 | 28.18 | -6.38 |
| Cumulative % total return (GBP) | | | 1 M | YTD | 1 Year | 3 Yrs | 5 Yrs | Launch* |
| Fund (Y class, 0.89% OCF) | | | 13.7 | -6.7 | -3.5 | 10.6 | 13.6 | 115.1 |
| MSCI AC Pacific ex Japan Index | | | 15.9 | -7.9 | -8.6 | 8.2 | 12.9 | 82.8 |
| IA Asia Pacific ex Japan | | | 12.6 | -6.4 | -6.1 | 17.2 | 22.0 | 100.5 |

Annualised % total return from launch (GBP)



Risk analysis - Annualised, weekly, from launch on 19.12.2013, in GBP

| 30/11/2022 | Index | Sector | Fund |
|-------------------|--------|--------|--------|
| Alpha | 0 | 1.82 | 3.02 |
| Beta | 1 | 0.88 | 0.83 |
| Information ratio | 0 | 0.31 | 0.29 |
| Maximum drawdown | -31.75 | -24.54 | -24.84 |
| R squared | 1 | 0.95 | 0.81 |
| Sharpe ratio | 0.18 | 0.29 | 0.34 |
| Tracking error | 0 | 3.64 | 6.76 |
| Volatility | 15.73 | 14.18 | 14.55 |

Fund returns are for share classes with a current Ongoing Charges Figure (OCF) stated above; returns for share classes with a different OCF will vary accordingly. Source: FE fundinfo bid to bid, total return (0.89% OCF). *Fund launch date: 19.12.2013.

TB Guinness Asian Equity Income Fund

TB Guinness Asian Equity Income Fund - UK investors should be aware that the Guinness Asian Equity Income Fund is available as a UK-domiciled fund denominated in GBP. The TB Guinness Asian Equity Income Fund is available from 0.79% OCF. The documentation needed to make an investment, including the Prospectus, the Key Investor Information Document (KIID) and the Application Form, is available at www.guinnessgi.com/funds/tb-guinness-asian-equity-income-fund



Important information

Issued by Guinness Global investors, a trading name of Guinness Asset Management Limited, which is authorised and regulated by the Financial Conduct Authority.

This report is primarily designed to inform you about equities and equity markets invested in by the Guinness Asian Equity Income Fund. It may provide information about the Fund's portfolio, including recent activity and performance. It contains facts relating to the equity markets and our own interpretation. Any investment decision should take account of the subjectivity of the comments contained in the report.

This document is provided for information only and all the information contained in it is believed to be reliable but may be inaccurate or incomplete; any opinions stated are honestly held at the time of writing, but are not guaranteed. The contents of the document should not therefore be relied upon. It should not be taken as a recommendation to make an investment in the Fund or to buy or sell individual securities, nor does it constitute an offer for sale.

Risk

The Fund invests only in stocks of companies that are traded on Asian stock exchanges or that do at least half of their business in Asia; it is therefore susceptible to the performance of that region, and can be volatile. Details on the risk factors are included in the Fund's documentation, available on our website at guinnessgi.com/literature. Shareholders should note that all or part of the fees and expenses will be charged to the capital of the Fund. This will have the effect of lowering the capital value of your investment.

Documentation

The documentation needed to make an investment, including the Prospectus, the Key Investor Information Document (KIID) and the Application Form, is available in English from www.guinnessgi.com or free of charge from:-

 the Manager: Link Fund Manager Solutions (Ireland) Ltd (LFMSI), 2 Grand Canal Square, Grand Canal Harbour, Dublin 2, Ireland; or,the Promoter and Investment Manager: Guinness Asset Management Ltd, 18 Smith Square, London SW1P 3HZ.

LFMSI, as UCITS Man Co, has the right to terminate the arrangements made for the marketing of funds in accordance with the UCITS Directive.

Investor Rights

A summary of investor rights in English is available here:https://www.linkgroup.eu/policy-statements/irish-management-company/

Residency

In countries where the Fund is not registered for sale or in any other circumstances where its distribution is not authorised or is unlawful, the Fund should not be distributed to resident Retail Clients. **NOTE: THIS INVESTMENT IS NOT FOR SALE TO U.S. PERSONS.**

Structure & regulation

The Fund is a sub-fund of Guinness Asset Management Funds PLC (the "Company"), an open-ended umbrella-type investment company, incorporated in Ireland and authorised and supervised by the Central Bank of Ireland, which operates under EU legislation. If you are in any doubt about the suitability of investing in this Fund, please consult your investment or other professional adviser.

Switzerland

This is an advertising document. The prospectus and KIID for Switzerland, the articles of association, and the annual and semi-annual reports can be obtained free of charge from the representative in Switzerland, Carnegie Fund Services S.A., 11, rue du Général-Dufour, 1204 Geneva, Switzerland, Tel. +41 22 705 11 77, www.carnegie-fund-services.ch. The paying agent is Banque Cantonale de Genève, 17 Quai de l'Ile, 1204 Geneva, Switzerland.

Singapore

The Fund is not authorised or recognised by the Monetary Authority of Singapore ("MAS") and shares are not allowed to be offered to the retail public. The Fund is registered with the MAS as a Restricted Foreign Scheme. Shares of the Fund may only be offered to institutional and accredited investors (as defined in the Securities and Futures Act (Cap.289)) ('SFA') and this material is limited to the investors in those categories

Telephone calls will be recorded and monitored

